Appendices

Appendix 1 – Radiocarbon Dating Results

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ISO/IEC 17025:2017-Accredited Testing Laboratory

BetaCal 5.0

Calibration of Radiocarbon Age to Calendar Years

(High Probability Density Range Method: INTCAL20)

(Variables: d13C = -26.44 o/oo)

Beta-Laboratory Number **779479**

Conventional Radiocarbon Age (BP) **1640 +/- 30 BP**

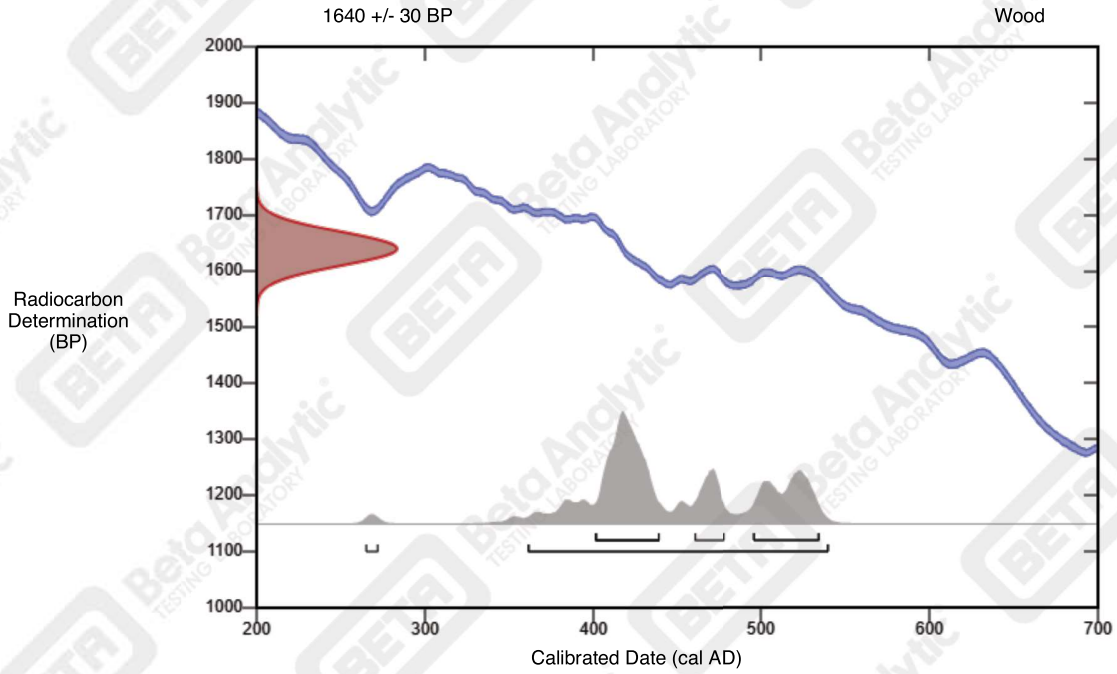
95.4% Probability Calibrated Range(s)

(94.8%)	363 - 538 cal AD	(1587 - 1412 cal BP)
(0.6%)	267 - 270 cal AD	(1683 - 1680 cal BP)

68.2% Probability Calibrated Range(s)

(36.5%)	403 - 437 cal AD	(1547 - 1513 cal BP)
(22.2%)	498 - 533 cal AD	(1452 - 1417 cal BP)
(9.5%)	462 - 476 cal AD	(1488 - 1474 cal BP)

25-0013-106



Database Used

INTCAL20

References

References to Probability Method

Bronk Ramsey, C. (2009). Bayesian analysis of radiocarbon dates. Radiocarbon, 51(1), 337-360.

References to Database INTCAL20

Reimer, et al., 2020, Radiocarbon 62(4): 725-757.

Appendix 2 – Geoarchaeological Test Pit Results

Geoarchaeological Test Pits at Spalding, Lincolnshire

Matt Law, PhD ACIfA FRGS

On behalf of Dee Archaeological Services Ltd

1. Introduction

1.1 Following an archaeological evaluation at land of the A16, Spalding, Lincolnshire (NGR: TF 26267 23155), a series of laterally extensive alluvial deposits were identified across the site. In order to investigate the nature and extent of these deposits, nine test pits were excavated for geoarchaeological recording.

1.2 The fieldwork was carried out by Dr Matt Law in September 2025

1.3 The work was carried out in accordance with the Written Scheme of Investigation drawn up by Wessex Archaeology (2025).

2. Aims

2.1 The general aims of the geoarchaeological test pitting were to:

- establish the broad presence/absence, nature, character, distribution, extent and depth of alluvial deposits across the site
- develop a preliminary assessment of the potential for organic preservation at the site.

2.2 The objective of the test pitting was to

- ascertain (where alluvial deposits are encountered) their extent, depth below ground surface, and character

3. Methodology

3.1 Nine geoarchaeological test pits (denoted Tr 1 – Tr 9) were excavated at the site. The pits were excavated using a tracked mechanical excavator to depths ranging from 2.3m to 3.8m below ground level.

3.2 Sediment description was undertaken in the field. Sedimentary components are described using the modified Troels-Smith protocol of Aaby and Berglund (1986). The elements of this relevant to this report are summarised in Table 1.

Table 1: Modified Troels-Smith nomenclature used in this report

Abbreviation	Element Name	Description
As	*Argilla steatodes*	Particles of clay
Ag	*Argilla granosa*	Particles of silt
Ga	*Grana arenosa*	Particles of sand

4. Results

4.1 Lithostratigraphic descriptions for the test pits are set out below.

NARRATIVE SUMMARY OF THE LITHOSTRATIGRAPHY

4.2 The test pits revealed a remarkably consistent stratigraphic sequence across the site, comprising topsoil, subsoil, and thick alluvial deposits extending beyond depths of 2.3m to 3.8m below ground level (bgl). Ground surface elevations ranged from 2.37m to 2.97m aOD.

4.3 All test pits exhibited a thin topsoil layer (0.1m to 0.23m thick) of uniform light greyish brown silty clay with organo-mineral content, fine sand, common herbaceous roots, and rare ceramic building material (CBM) fragments. This was consistently underlain by a subsoil layer of similar composition but mineral in character, with rare fine roots and no inclusions.

4.4 Below the subsoil, substantial alluvial deposits were encountered across all test pits. These deposits displayed a consistent vertical progression in redox characteristics. The upper portions typically comprised firm light yellowish brown silty clay with moderate to frequent light blue-grey mottles, indicating periods of oxidation. With increasing depth, these deposits transitioned to predominantly dark bluish grey clay with common to frequent black mottles, reflecting increasingly reducing conditions associated with waterlogging.

4.5 Modern agricultural intervention was evident in several test pits, with field drains recorded at depths of approximately 0.8m below ground level in Tr 1, Tr 2, and Tr 9.

4.6 Two test pits contained deposits of particular interest. In Tr 6, a degraded organic layer (0.16m thick) was identified at 1.04m to 1.2m below ground level (1.363m to 1.203m aOD). This very dark grey-black silty clay was organo-mineral in character and well humified, with no inclusions. It was sharply bounded above and below by alluvial clay. This deposit may represent an episode of peat formation within a topographic hollow, perhaps associated with a former channel.

4.7 Tr 8 revealed dumped fill between 0.37m and 1.43m below ground level, comprising mid greyish-brown silty clay with moderate charcoal flecks and CBM fragments increasing with depth. The deposit contained frequent coconut shells and wood fragments, clearly indicating modern disturbance and infilling.

4.8 The consistency of the alluvial stratigraphy, the clear redox zonation, and the lateral extent of deposits indicate deposition within a low-lying floodplain environment, consistent with the site's location within the Lincolnshire Fens.

Tr 1

Table 2: Lithostratigraphy in Tr 1

Depth below ground level (m bgl)	Level (m aOD)	Description	Interpretation
0	2.717	Uniform light greyish brown silty clay (As2 Ag2 Ga+), organo-mineral, some fine sand, common fine herbaceous roots, rare CBM fragments. Sharp boundary to	Topsoil
0.1	2.617	Uniform light greyish brown silty clay (As3 Ag1), mineral, rare fine herbaceous roots. No inclusions. Sharp boundary to	Subsoil
0.38	2.337	Firm light yellowish brown silty clay (As3 Ag1) with moderate light blue-grey mottles, mineral, no inclusions. Field drain at 0.84m bgl. Frequency of blue-green colouration increases below 1m bgl	Alluvium
1.48	1.237	Continuation of above but predominantly dark bluish grey with common light yellowish brown mottles	Alluvium
2.3	0.417	Bottom of test pit	



Figure 1: Test pit in Tr 1, looking NE

Tr 2

Table 3: Lithostratigraphy of Tr 2

Depth below ground level (m bgl)	Level (m aOD)	Description	Interpretation
0	2.817	Uniform light greyish brown silty clay (As2 Ag2 Ga+), organo-mineral, some fine sand, common fine herbaceous roots, rare CBM fragments. Sharp boundary to	Topsoil
0.14	2.677	Uniform light greyish brown silty clay (As3 Ag1), mineral, rare fine herbaceous roots. No inclusions. Sharp boundary to	Subsoil
0.38	2.437	Firm light yellowish brown silty clay (As3 Ag1 Ga+) with moderate light blue-grey mottles, mineral, no inclusions. Some fine to medium sand	Alluvium
0.68	2.137	Continuation of above becoming light bluish grey	Alluvium
0.77	2.047	Continuation of above becoming mid yellowish-brown sandy clay (As3 Ag1). Plastic land drain at 0.81m bgl	Alluvium
0.86	1.957	Dark reddish brown silty clay (As3 Ag1) with common dark grey blue mottles	Alluvium
2	0.817	Dark bluish grey silty clay (As3 Ag1) with common black mottles	Alluvium
2.5	0.317	Bottom of test pit	



Figure 2: Test pit in Tr 2, looking S

Tr 3

Table 4: Lithostratigraphy of Tr 3

Depth below ground level (m bgl)	Level (m aOD)	Description	Interpretation
0	2.617	Uniform light greyish brown silty clay (As2 Ag2 Ga+), organo-mineral, some fine sand, common fine herbaceous roots, rare CBM fragments. Sharp boundary to	Topsoil
0.1	2.517	Uniform light greyish brown silty clay (As3 Ag1), mineral, rare fine herbaceous roots. No inclusions. Sharp boundary to	Subsoil
0.46	2.157	Firm light yellowish brown silty clay (As3 Ag1) with moderate light blue-grey mottles, mineral, no inclusions. Frequency of blue-grey mottles increases with depth. Gradual transition to	Alluvium
0.82	1.797	Continuation of above with common dark reddish-brown flecks	Alluvium
2.2	0.417	Dark bluish-grey clay (As4) with common mid yellowish brown mottles. Mineral. No inclusions	Alluvium
3.8	-1.183	Bottom of test pit	



Figure 3: Test pit from Trench 3, looking SW

Tr 4

Table 5: Lithostratigraphy of Tr 4

Depth below ground level (m bgl)	Level (m aOD)	Description	Interpretation
0	2.97	Uniform light greyish brown silty clay (As2 Ag2 Ga+), organo-mineral, some fine sand, common fine herbaceous roots, rare CBM fragments. Sharp boundary to	Topsoil
0.11	2.86	Uniform light greyish brown silty clay (As3 Ag1), mineral, rare fine herbaceous roots. No inclusions. Sharp boundary to	Subsoil
0.43	2.54	Light yellowish brown sandy clay (As3 Ag1 Ga+), fine sand, common light bluish grey mottles	Alluvium
1.77	1.2	Continuation of above becoming dark greyish-brown. Frequency of blue mottles increases below 2m bgl, and predominantly blue by 2.5m bgl	Alluvium
2.6	0.37	Bottom of test pit	



Figure 4: Test pit in Tr 4, looking SE

Tr 5

Table 6: Lithostratigraphy of Tr 5

Depth below ground level (m bgl)	Level (m aOD)	Description	Interpretation
0	2.37	Uniform light greyish brown silty clay (As2 Ag2 Ga+), organo-mineral, some fine sand, common fine herbaceous roots, rare CBM fragments. Sharp boundary to	Topsoil
0.16	2.21	Uniform light greyish brown silty clay (As3 Ag1), mineral, rare fine herbaceous roots. No inclusions. Sharp boundary to	Subsoil
0.48	1.89	Firm light yellowish brown silty clay (As3 Ag1) with common light blue-grey mottles, mineral, no inclusions. Frequency of blue-grey mottles increases with depth. Clay is more blue towards the western end of the pit	Alluvium
1	1.37	Continuation of above but predominantly mid bluish-grey with common black mottles. Silt component decreases with depth. Very gradual transition to	Alluvium
2.2	0.17	Dark bluish grey clay (As4) with common black mottles. Mineral. No inclusions	Alluvium
3.3	-0.93	Bottom of pit	



Figure 5: Test pit in Trench 5, looking SW.

Tr 6

Table 7: Lithostratigraphy of Tr 6

Depth below ground level (m bgl)	Level (m aOD)	Description	Interpretation
0	2.403	Uniform light greyish brown silty clay (As2 Ag2 Ga+), organo-mineral, some fine sand, common fine herbaceous roots, rare CBM fragments. Sharp boundary to	Topsoil
0.18	2.223	Uniform light greyish brown silty clay (As3 Ag1), mineral, rare fine herbaceous roots. No inclusions. Sharp boundary to	Subsoil
0.32	2.083	Firm light yellowish brown silty clay (As3 Ag1) with moderate light blue-grey mottles, mineral, no inclusions. Frequency of blue-grey mottles increases with depth. Abrupt boundary to	Alluvium
1.04	1.363	Very dark grey-black silty clay (Ag3 As1). Organo-mineral. Well humified. No inclusions. Sharp boundary to	Degraded organic layer
1.2	1.203	Mid greyish-blue clay (As4) with common black mottles	Alluvium
3.3	-0.897	Bottom of test pit	



Figure 6: Test pit in Tr 6, looking S

Tr 7

Table 8: Lithostratigraphy of Tr 7

Depth below ground level (m bgl)	Level (m aOD)	Description	Interpretation
0	2.5	Uniform light greyish brown silty clay (As2 Ag2 Ga+), organo-mineral, some fine sand, common fine herbaceous roots, rare CBM fragments. Sharp boundary to	Topsoil
0.23	2.27	Uniform light greyish brown silty clay (As3 Ag1), mineral, rare fine herbaceous roots. No inclusions. Sharp boundary to	Subsoil
0.63	1.87	Firm light yellowish brown silty clay (As3 Ag1) with frequent light blue-grey mottles, mineral, no inclusions	Alluvium
1.39	1.11	Continuation of above but predominantly mid bluish-grey	Alluvium
2.5	0	Bottom of test pit	



Figure 7: Test pit in Tr 7, looking S

Tr 8

Table 9: Lithostratigraphy of Tr 8

Depth below ground level (m bgl)	Level (m aOD)	Description	Interpretation
0	2.457	Uniform light greyish brown silty clay (As2 Ag2 Ga+), organo-mineral, some fine sand, common fine herbaceous roots, rare CBM fragments. Sharp boundary to	Topsoil
0.37	2.087	Uniform mid greyish-brown silty clay (As2 Ag2) with moderate charcoal flecks and CBM fragments below 0.68m bgl. Frequent coconuts and wood fragments. Very sharp transition to	Dumped fill
1.43	1.027	Mid bluish grey clay (As4) with some black staining in the upper 0.2m. Common black mottles	Alluvium
2.5	-0.043	Bottom of test pit	



Figure 8: Coconuts in fill within Trench 8



Figure 9: Test pit in Tr 8, looking S

Tr 9

Table 10: Lithostratigraphy of Tr 9

Depth below ground level (m bgl)	Level (m aOD)	Description	Interpretation
0	2.388	Uniform light greyish brown silty clay (As2 Ag2 Ga+), organo-mineral, some fine sand, common fine herbaceous roots, rare CBM fragments. Sharp boundary to	Topsoil
0.22	2.168	Uniform light greyish brown silty clay (As3 Ag1), mineral, rare fine herbaceous roots. No inclusions. Cut at SW end by modern feature. Sharp boundary to	Subsoil
0.6	1.788	Firm light yellowish brown silty clay (As3 Ag1) with moderate light blue-grey mottles, mineral, no inclusions. Frequency of blue-grey mottles increases with depth. Field drain at 0.82m bgl in western section	Alluvium
0.92	1.468	Continuation of above but predominantly mid bluish-grey	Alluvium
2.65	-0.262	Bottom of test pit	



Figure 10: Test pit in Tr 9, looking WSW

5. Discussion

5.1 The test pit excavations revealed a uniform stratigraphic sequence across the site comprising topsoil, subsoil, and substantial alluvial clay deposits extending to considerable depth. The alluvial deposits display characteristic redox features, with oxidised yellowish-brown upper portions transitioning to reduced bluish-grey sediments at depth, indicating fluctuating water tables and prolonged waterlogging typical of fenland environments.

5.2 The presence of field drains at consistent depths across multiple test pits demonstrates ongoing agricultural management of this low-lying landscape. The modern disturbance recorded in Tr 8, containing materials such as coconut shells alongside CBM and charcoal, indicates localised infilling activities.

5.3 The degraded organic layer identified in Tr 6 is of particular interest. This well-humified deposit, occurring as a discrete lens within the alluvial sequence, may represent a former stable land surface or episode of organic accumulation during a period of reduced alluviation. Such horizons can provide valuable palaeoenvironmental evidence and dating opportunities for understanding landscape development in this part of the Fens.

6. Conclusions

6.1 A series of nine test pits were excavated at Spalding, Lincolnshire, under geoarchaeological supervision. The site revealed a consistent sequence of alluvial clay deposits with overlying topsoil and subsoil, with depths extending beyond 3.8m below ground level. The alluvial deposits display clear redox zonation reflecting the waterlogged nature of this fenland environment.

6.2 A degraded organic layer was identified in Tr 6, representing a potential former peat deposit perhaps infilling a topographic hollow.

6.3 With the exception of the organic layer in Tr 6, there was generally poor potential for organic preservation in these deposits, which are predominantly oxidised in their upper portions and highly reduced at depth.

Reference cited

Aaby, B. and Berglund, B.E., 1986. Characterization of peat and lake deposits. In: Berglund, B.E. (ed.) *Handbook of Holocene Palaeoecology and Palaeohydrology*. Chichester: John Wiley & Sons, pp. 231-246.

Appendix 3 – Data Management Plan

Version	Author	Date	Summary
1.0	R Matthews	09/12/25	Draft

Project Description:	An archaeological evaluation at land off Spalding Lincolnshire was undertaken in September 2025.		
Project code:	25-0013	**Oasis Id:**	
Digital Repository	Archaeological Data Service (ADS)	**ADS Id:**	TBC
Physical Repository	None	**Accession Number:**	N/A
Project Manger:	D Garner	**Data Manger:**	TBC
Archive Manager:	R Matthews		
Related Polices:	• Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives, CIfA (2020) • Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials, CIfA (2020) • Selection Toolkit for Archaeological Archives, CIfA (2018) • Guides to Good Practice, ADS (2023) • Guidelines For Depositors v.4.0, ADS (2020) • ADAPt project 6896, (Historic England) Digital Preservation Policy (2016) • DAS Digital Data and Preservation Policy (pending) • DAS Archival Selection, Retention and Disposal Policy (pending)		

1. Data Collection

1.1. The archaeological work consisted of an archaeological evaluation. The key archaeological techniques undertaken were excavation, recording and reporting.

1.1.1. Given the nature of the work the following data types were created and stored.

- Images

Type	Format	Volume
Digital SLR Images	.jpg / .tiff/ .raf	83 files 581.3MB

- Written and drawn

Type	Format	Volume
Text/documents -Reports	.pdf	2 files 26MB
Text/documents - site fieldwork sheets and drawings)	.pdf	36 files 105MB
Spreadsheets	.xlsx / .pdf	3, avg size 300KB

-

- Survey

Type	Format	Volume
Shapefiles	.shp	9 files including associated layers, 112MB

1.2. The standard method of data collection was applied throughout the project to all born data and digitised records, these adhered to the project Written Scheme of investigation (WSI), Best Practice, Standards and Guidelines, as well as, DAS Archaeology's in-house styles and policies.

1.2.1. External contractors and specialists are required to confirm to these standards and methods.

1.2.2. All born digital data and digitised records are kept within a specific project folder on Dee Archaeological Services (DAS) secure drive. These folders are organised using an in-house style, named with an identifier, descriptor and version.

1.3. To ensure quality assurance, all equipment and site data is regularly checked and reviewed by the appropriate project staff during the life or the project; with project folders maintained and back up by DAS in-house team.

2. Documentation and Metadata

2.1. The data collected includes standard formats, which abide by the project brief Museum Deposition Guidelines or Digital Repository Guidelines, and conform to the FAIR data principles: findable, accessible, interoperable and reusable.

2.2. Data will retain, as far as possible, the original metadata ascribed during creation. All metadata that is incorporated in the creation of the file, particularly date of creation, will be retained.

3. Ethics and legal compliance

3.1. DAS has policies regarding the ethical use of its data which comply with National law and Industry Guidelines. All data shared and preserved by DAS adheres to GDPR as specified in DAS GDPR Policy (2025).

3.2. DAS and any external contractors will not use Generative AI to collect or produce data, as per DAS Policies.

3.3. Copyright for all data collected or created the project team belongs to DAS.

3.4. The copyright from data collected and created from external specialists/contractors, as engaged by DAS, belong to DAS and will be specified in relevant contacts.

3.5. Data used under licence from external data providers, such as OS or HER, will only be used in terms of the licence and will not be included in the site archive unless permitted by the terms of the licence.

4. Data Security: Storage and Backup

4.1. DAS uses internal file servers and a cloud storage service provider, this is managed by an in-house team, with regular offline physical backups.

4.2. The server is accessible by staff on and off site through a secure log-in.

4.3. The physical site archive is the responsibility of the project manager, who will on completion of the work, upload the relevant information to the project folder.

5. Selection and Preservation

5.1. All data relating to the archaeological understanding of the site is kept within the working project archive.

5.1.1. It is understood that not all data accumulated needs to be retained and deposited with the Archaeological Archives. Prior to deposition a selection strategy and DMP will be reviewed and agreed with the appropriate stakeholders, with all relevant data then deposited.

5.1.2. Any de-selected data which is considered to have intrinsic value, may be kept by DAS within a secure company server. Any material selected for deletion will comply with the standards laid out within DAS in-house standards.

5.2. The long term preservation plan for the dataset is for safe storage with DAS until it is securely deposited with Archaeological Data Service (ADS) and OASIS, or another appropriate digital repository.

5.3. The relevant Museum will be contacted at the project initiation stage, with confirmation of depositing with a trusted digital repository. ADS will be notified of the intended repository and updated at an appropriate time.

5.4. Exacting costs of the deposition of digital data are not possible to produce prior to commencement of works. All archaeological projects have the potential to produce a wide range and size of data sets, depending on the scale of the archaeological resource found, the techniques required to record and other environmental factors during works.

5.5. Taking into consideration our understanding of the site and the type of archaeological works being undertaken, this project is considered unlikely to produce data in excess of what can be submitted through ADS-Easy. These costs have been estimated and included into the project budget..

6. Data Sharing

6.1. Data will be uploaded to OASIS and ADS, a Core Seal Trust approved repository (unless otherwise stated), within 12 months of project completion.

6.2. The ADS will disseminate the digital archive online under a Creative Commons licence and the dataset will be assigned a unique identifier (DOI).

6.3. There are no known restrictions on data sharing.

7. Responsibilities

7.1. Data capture, metadata production and data quality is the responsibility of the Project Team, assured by the Project Manager.

7.2. Storage and backup of data in the field is the responsibility of the field team.

7.3. Once data is incorporated into the DAS server, it's storage and backup is managed by an in-house team.

7.4. Data archiving is undertaken by the project team under the guidance of the Archives manager who is responsible for the transfer of the Archaeological Project Archive to the agreed repository.

Appendix 4 – OASIS Form

OASIS Summary for deearcha1-539143

OASIS ID (UID)	deearcha1-539143
Project Name	Evaluation at Spalding
Sitename	Spalding
Sitecode	25-0013
Project Identifier(s)	Land at Spalding Lincolnshire
Activity type	Evaluation
Planning Id	
Reason For Investigation	Planning: Between application and determination
Organisation Responsible for work	
Project Dates	
Location	Spalding NGR : TF 26258 23083 LL : 52.79055480559934, -0.129106173951487 12 Fig : 526258,323083
Administrative Areas	Country : England County/Local Authority : Lincolnshire Local Authority District : South Holland Parish : South Holland, unparished area
Project Methodology	
Project Results	
Keywords	
Funder	
HER	Lincolnshire HER - unRev - STANDARD
Person Responsible for work	
HER Identifiers	
Archives	

Report generated on: 09 Dec 2025, 12:30