



Archaeological Observation

Concerning:
Oxenden Corner Marshside DMA Mains Replacement Scheme
(13-1323 / 69649)
Kent

On behalf of:

south east water

June 2020

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Cover: View looking W across fields extending to the W of Oxenden Corner

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1 Non-Technical Summary

Border Archaeology (BA), on behalf of South East Water (SEW), undertook an Archaeological Observation (also referred to as 'Watching Brief') in connection with the Oxenden Corner Marshside DMA Mains Replacement Scheme (13-1323), located to the SE of the village of Broomfield, Herne Bay, Kent (fig. 1). Archaeological Monitoring was carried out between the 28th May 2019 and the 25th June 2019.

Trenches 001 and 002 traversed two fields located between Ford Road and Ford Hill Road. Topsoil here was removed to the required engineering depth within a designated working area within which a pipe-trench was then excavated to the required depth for the pipe installation. Trenches 003, 004 and 005 were located within Ford Road and at Ford Hill. These were excavated under archaeological supervision, using a mechanical excavator fitted with a flat grading bucket.

Archaeological features were only identified within Trench 002, Field 2. No evidence of the Roman road running from Reculver to Sturry along the present-day Ford Hill Road was identified at Oxenden Corner in Trenches 004 or 005, however at the ENE extent of Trench 002, ditch [002009] was identified running parallel to the road, and is interpreted as the probable remains of a road-side ditch associated with the Roman road, though no datable finds material was recovered, likely owing to the small area excavated. A small ditch terminus [002004], containing a residual fragment (heavily abraded) of probable Iron Age pottery was interpreted as the likely remains of an agricultural feature owing to the palaeoenvironmental profile of its single fill, and likely representative of a drainage feature of potential prehistoric or early Romano-British date. The most significant feature was [002011], a 6.52m wide and 0.48m deep ditch feature which was identified on LiDAR imagery and appears to be associated with a large rectilinear enclosure lying to the immediate SW and S. No datable finds material was recovered though the rectilinear enclosure is bi-sected by the Roman road, inferring that the enclosure predates the road. By association it is considered that [002011] is likely to be of the same date- of later prehistoric or early Romano-British date. A late 19th – early 20th century field boundary was also identified as linear ditch feature [002006] running NW-SE diagonally through Field 2 which had been severely truncated from modern ploughing activity, only the basal portion remaining evident.

The archaeological evidence uncovered suggests some prehistoric or Romano-British activity along this pipeline route. Most significantly it has determined the below ground survival of cropmark features previously identified on LiDAR imagery and through aerial photography within the fields lying to the W of Ford Hill Road within the groundworks area. Research themes identified through the South-East Research Framework (SERF) were not realized through the course of this archaeological investigation, however the findings of this report may prove helpful for future archaeological works in this area. Further investigation of these cropmark features would no doubt provide more in-depth insight into agricultural and rural settlement practices in the transitional period between the Iron Age and Romano-British period in this locale.

2 Introduction

Border Archaeology (BA) was commissioned by South East Water (SEW) to undertake an Archaeological Observation of the proposed Oxenden Corner Marshside DMA Mains Replacement Scheme (13-1323), located to the SE of the village of Broomfield, Herne Bay, Kent, to install approximately 400m of 315mm HPPE main pipeline (fig. 1).

The scheme lies roughly 600m to the SE of Broomfield, a suburb of Herne Bay, at c.33-38m AOD. The route crossed the Ford, Maypole and Oldtree (Hoath) Conservation Area, as designated by Kent County Council, between NGR TR 20522 66306 and the NE pipeline terminus. The works focused on two fields located between Ford Road and Ford Hill Road, separated by a drainage watercourse (crossed by the scheme at NGR TR 20304 66229). The NE extent of the pipeline ran c.80m across Ford Hill Road and along Highstead Road whilst the SW extent was located within the carriageway of Ford Road.

The table below shows the lengths of the individual sections of open-cut trenching (see *fig. 2*) along the route:

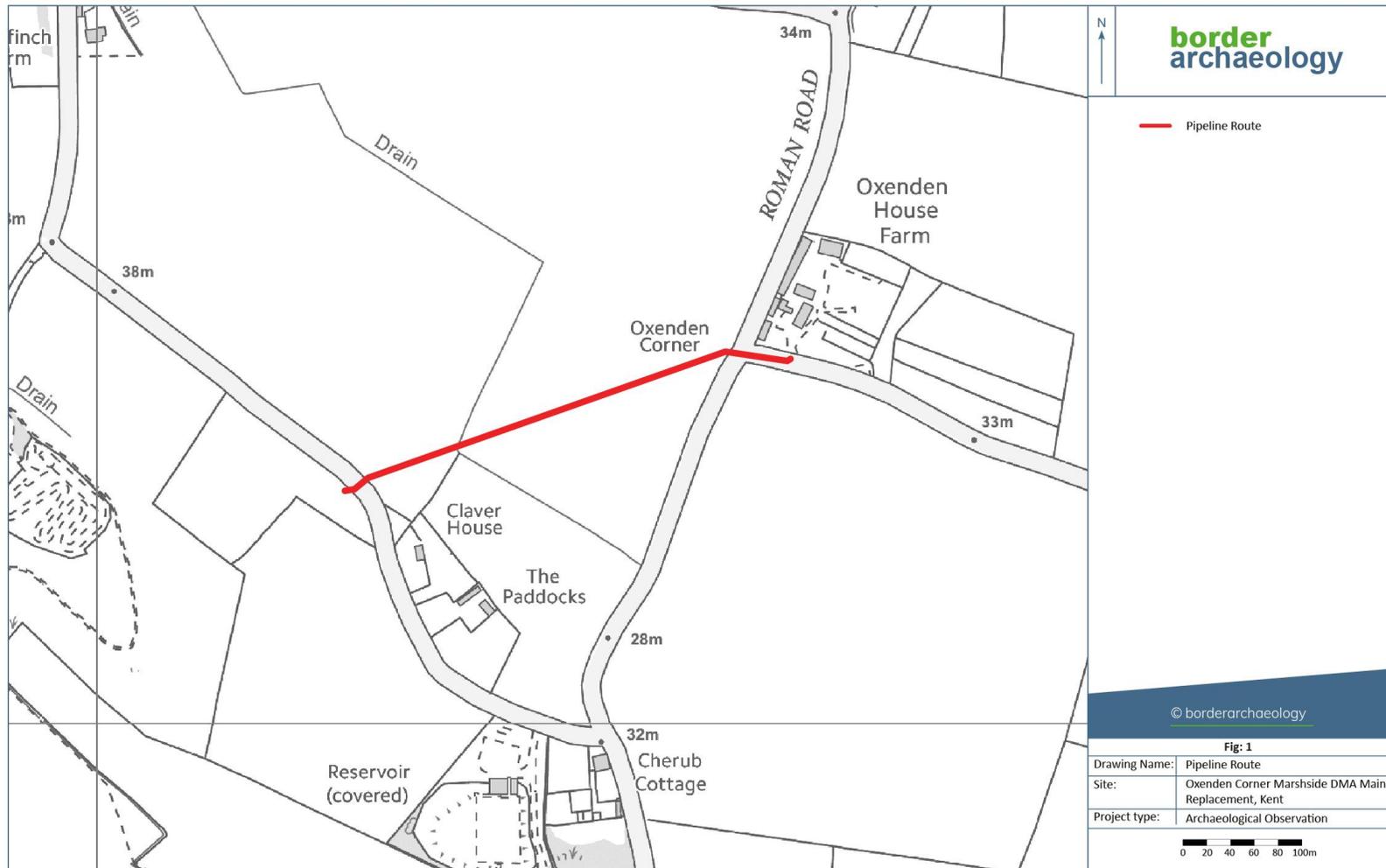
Trench	Dimensions (L × W × D)
Trench 001	90m (l) × 0.5m (w) × 1.4m (d)
Trench 002	250m (l) × 0.5m (w) × 1.37-2.5m (d)
Trench 003	2m (l) × 2m (w) × 1.12m (d)
Trench 004	60m (l) × 0.34m (w) × 0.89m (d)
Trench 005	2.5m (l) × 1.5m (w) × 1.08m (d)

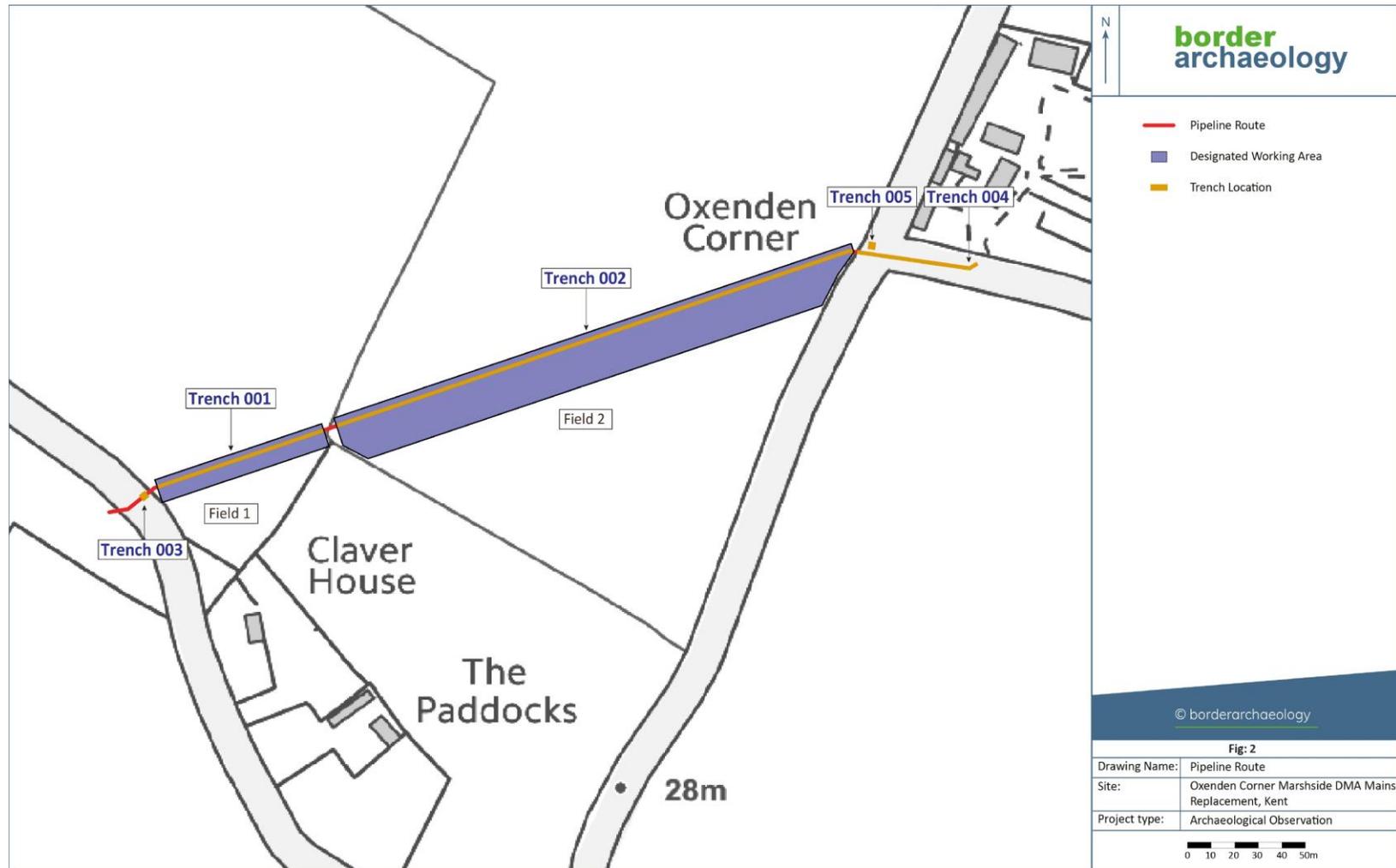
3 Topography & Geology

The Soil Survey for England and Wales (SSEW 1983) records predominantly typical paleo-argillic brown earths of the SONNING 2 Series (581C) in this area, composed of well-drained flinty coarse loamy and gravelly soils associated with slowly permeable seasonally waterlogged fine loamy over clayey soils, and coarse loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging. The underlying geology is recorded as plateau and river terrace drift.

The British Geological Survey (BGS 2019) records underlying bedrock of the London Clay Formation and the Harwich Formation. The London Clay Formation is defined as clay and silt sedimentary bedrock, whilst the Harwich Formation is listed as sand and gravel sedimentary bedrock.

During the archaeological observation the natural substratum encountered along the route consisted of a loose mid to light brown yellow/orange sand and clay with patches of sandy gravel. Where encountered it was located between c. 0.50m – c. 0.70m below ground level (bgl).





4 Historical and Archaeological Background

The *Rapid Appraisal* (BA 2018) (hereafter referred to as RA) provided an in-depth account of the Historical and Archaeological background of the area connected with the pipeline route. This assessment formed the basis of understanding for the archaeological observation which took place, in accordance with the *Written Scheme of Investigation* (BA 2019) (hereafter referred to as WSI), between 28th May and 25th June 2019.

The following summarises the results of the RA for contextual purposes:

4.1 Prehistoric activity

No recorded evidence of early prehistoric activity, in terms of sites or findspots, has been identified in the immediate vicinity of the route, although this may well reflect the fact that little archaeological fieldwork has been previously undertaken in this area, in terms of geophysical survey, fieldwalking or excavation.

The area traversed by the route has been assessed by the Stour Basin Palaeolithic Project (SBPP), undertaken by Kent County Council in collaboration with the University of Southampton, Canterbury City Council and Canterbury Archaeological Trust, as having 'High' potential for Palaeolithic remains, presumably reflecting its low-lying river terrace location and underlying geology.

4.2 Late Prehistoric and Romano-British

At Oxenden Corner (NGR TR 20534 66310), the scheme crosses the line of a Roman road (NGR TR 26 NW 203) connecting Sturry and the *castrum* (fort) at Reculver (on the N Kent coast), as an offshoot of the main Roman highway between Canterbury and Thanet. The course of this Roman highway is represented by present-day Ford Hill Road. A series of cropmarks are recorded to the W of Ford Hill Road within the fields traversed by the pipeline route. There is significant potential for encountering buried features or deposits associated with roadside settlement activity and deposits/features such as road metaling or ditches within these fields and the carriageway.

4.3 Medieval

There is little recorded evidence of medieval activity identified in the immediate vicinity of the pipeline route. The Kent HER lists the present fieldscape as representative of late medieval to 17th/18th enclosure, suggesting that any relict field systems and agricultural features are likely to be medieval in date at the latest.

4.4 Post-Medieval

The lack of evidence for recorded post-medieval activity in the vicinity of the scheme, both on the Kent Historic Environment Record and the historic mapping, was noted. The two fields crossed by the scheme are recorded on

the Herne tithe map of 1839 as being under arable cultivation, and both fields appear to have remained under arable cultivation throughout the post-medieval and modern periods.

5 Aims & Objectives

The aim of the archaeological observation was to locate and record any archaeological finds, features or deposits within the groundworks area, assessing the character, extent and quality of the resource and establishing their importance within a local, regional and national context.

Dependent upon discovery, to address the research themes identified in the emergent *South East Research Framework (SERF)* and specified in the *Written Scheme of Investigation (WSI)* (BA 2019, section 3). The *South East Research Framework (SERF)* aims to identify what we know about the South East's historic environment and highlights what we want to know more about; and has established a research agenda and strategy for archaeological work in the South East region.

5.1 Early Palaeolithic & Upper Palaeolithic/Mesolithic

The pipe line route area falls within two Palaeolithic Character Areas (PCAs), namely, PCA 17: East Blean, Stour Terraces and PCA 29: North Blean, brickearth patches, dry valleys and terrace remnants. PCA 17 is characterised by Middle Pleistocene fluvial terraces underlying later Devensian slopewash deposits and is associated with the northward courses of the Stour (c.500,000-c.100,00 BP). PCA 29 is characterised by the presence of dry valleys infilled with Head Brickearth (slopewash) extending N from Blean to the coast, with remnants of fluvial terrace systems (c.450,000-c.10,000 BP) associated with these valleys when visible below the brickearth in the coastal cliff-face exposures. It is considered likely that unmapped terrace outcrops occur inland.

The scheme therefore has potential for the recovery of important Palaeolithic remains, such as large mammal fossils, molluscs, small vertebrates, and evidence for warm climate fauna such as hippo, bovid, deer etc within the area of PCA 17. Additionally, the groundworks lend an opportunity for the identification of previously unmapped geological deposits particularly within the area of PCA 29.

5.2 Bronze Age

A substantial Bronze Age ceramic assemblage has been recorded in the wider vicinity of the pipeline route. Any further ceramic evidence of this date would assist in establishing a firmly based ceramic chronology.

Archaeological sampling of any anoxic deposits (permanently waterlogged deposits) encountered in association with human activity, could provide palaeoenvironmental data which could contribute to questions pertaining to the evolution of settlement of the area during the Middle Bronze Age and of the transition to the later Iron Age.

5.3 Roman

The pipeline crosses the line of a Roman road (NGR TR 26 NW 203) at Oxenden Corner (NGR TR 20534 66310), its course represented by present-day Ford Hill Road. Any archaeological evidence for deposits or/and features associated with this road, or roadside settlement activity, could be relevant to the study of the road network at this time, examining in particular construction techniques, maintenance and final use dating.

The cropmarks located within the fields to the W of Ford Hill Road offer potential for the recovery of information regarding rural settlement which maybe relevant to determining patterns of change/regionalty.

For further research to be undertaken on pollen and palaeoenvironmental samples as a research priority in order to determine basic landscape characteristics of areas during the Roman period and to recover important faunal evidence and crop assemblages with the potential to address questions of rural production in terms of continuity/improvement.

6 Methodology

The programme of archaeological work was carried out in accordance with *Standard and Guidance for an archaeological watching brief* (ClfA 2014b) and *Standard and Guidance for the collection, documentation, conservation and research of archaeological materials* (ClfA 2014c). BA adheres to the *ClfA Code of conduct* (2014a) and is cognisant of Kent County Council's 'Specification for an archaeological watching brief for linear utility scheme' (Heritage Conservation Group 2016).

The Chartered Institute for Archaeologists (ClfA) states (2014b, 4) that the purpose of a watching brief (Archaeological Observation) is:

- To allow, within the resources available, the preservation by record of archaeological deposits, the presence and nature of which could not be established (or established with sufficient accuracy) in advance of development or other potentially disruptive works.
- To provide an opportunity, if needed, for the watching archaeologist to signal to all interested parties, before the destruction of the material in question, that an archaeological find has been made for which the resources allocated to the watching brief itself are not sufficient to support treatment to a satisfactory and proper standard.

6.1 Open-cut trenching

Approximately 400m of 315mm HPPE main pipeline was to be installed between NGR TR 20209 66195 (SW) and NGR TR 20587 66306 (NE). The engineering methodology for this scheme was open-cut trenching.

Within the two fields, topsoil was removed under archaeological supervision by the contractor using a mechanical excavator equipped with a flat-bladed bucket. The topsoil strip was undertaken to a standard sufficient for the supervising archaeologist to identify any significant archaeological horizons or features present and to allow for recording and subsequent investigation. Reasonable time and resources were allowed to support any further inspection or recording required. Following topsoil removal, a pipe-trench was excavated to the required engineering depth to facilitate the pipe installation. Removed material was stored along one side of the trench.

For the sections of open-cut trenching within the carriageway the road surface was removed using a top-cutter and hydraulic breaker. Under archaeological supervision the underlying deposits were then excavated. Archaeological features or deposits, where present, were recorded via the pipe-trench sections, and strictly within health and safety parameters.

6.2 Recording

This programme of works was recorded under the site code **OCSK19**.

An OASIS online record has been initiated and the OASIS number assigned is: borderar1-348811.

Full written, graphic and photographic records were made in accordance with BA's Archaeological Field Recording Manual (BA 2017). A pro-forma context recording sheet was compiled for each stratigraphic unit encountered. In the absence of archaeological deposits and/or features, the written record comprised a pro-forma trench recording sheet and an illustrated representative section for each excavated trench.

The drawn record was produced on gridded, archive-stable polyester film at an appropriate scale. Representative measured sections were prepared, as appropriate, showing the sequence and depths of deposits, where practicable and strictly within established safety parameters. All drawings were numbered and listed in a drawing register; these drawing numbers being cross-referenced to written site records.

The photographic record was made using a high-resolution digital camera, comprising photographs of archaeological features and appropriate groups of features and structures. An appropriate scale was included in each photograph and all records were indexed and cross-referenced to written site records. Details concerning subject and direction of view were maintained in a photographic register, indexed by frame number.

7 Results

7.1 Trench 001

The pipeline in this field extended ENE for approximately 90m through agricultural land.

A loose, dark grey-brown silty clay topsoil (001001) with occasional flint pebble and cobble inclusions approximately 0.34m thick was revealed within the 10m-wide working area. Below this deposit was a loose light orange-brown silty clay subsoil (001002) with occasional flint pebble and cobble inclusions approximately 0.36m thick. This overlaid the natural substratum (001003), seen at c. 0.70m bgl which comprised a loose mid brown-orange sand with occasional flint pebble and cobble inclusions and patches of firm blue or orange clay.

No archaeological features or deposits were encountered within this trench.



Plate 1: NNW-facing section showing topsoil (001001) in Trench 001 (1m scale & photo board)



Plate 2: NNW-facing section of pipe-trench 001 showing (001002) and (001003) (1m scale & photo board)

7.2 Trench 002

Trench 002 extended 250m NE of Trench 001 with initial topsoil removal within a 20m wide working area. The pipe-trench excavated within the working area measured 0.5m wide and ranged in depth between 0.84m and 2.6m bgl.

A loose, dark grey-brown silty clay topsoil (002001) with occasional flint pebble and cobble inclusions approximately 0.30m thick was revealed overlying a loose light orange-brown silty clay subsoil (002002) with occasional flint pebble and cobble inclusions approximately 0.30m thick. Below this deposit was the natural substratum (002003), a loose mid brown-orange sand with occasional flint pebble and cobble inclusions and patches of firm blue or orange clay.



Plate 3: Topsoil removal Trench 002 (T-scale 1m x 1m; photo board)



Plate 4: NNW-facing section showing (002001) in Trench 002 (1m scale & photo board)

Linear terminus [002004] (*fig 3; plate 5*) was revealed in plan cutting natural substratum (002003). It measured 1.32m wide, with a visible length of 1.4m running N-S; the linear terminus was to the N, and the feature appeared to extend S beyond the baulk of the trench/working area. A slot excavated across the feature revealed a V-shaped

profile with a maximum depth of 0.34m. A single fill was identified, (002005), a friable light grey-white clay sand with occasional flint pebble inclusions. No finds were recovered though the fill was sampled for palaeoenvironmental analysis. A small fragment of abraded pottery was recovered from the sample, which appeared to be hand-made and flint tempered. Flint tempered pottery is seen into the Roman period in Kent though it is suggested that this fragment is most likely of Iron Age date (*Appendix 2*). A fragment of slag and inclusions of common weeds were also retrieved from the sample though these were of little value and didn't assist in the dating or interpretation of the feature.

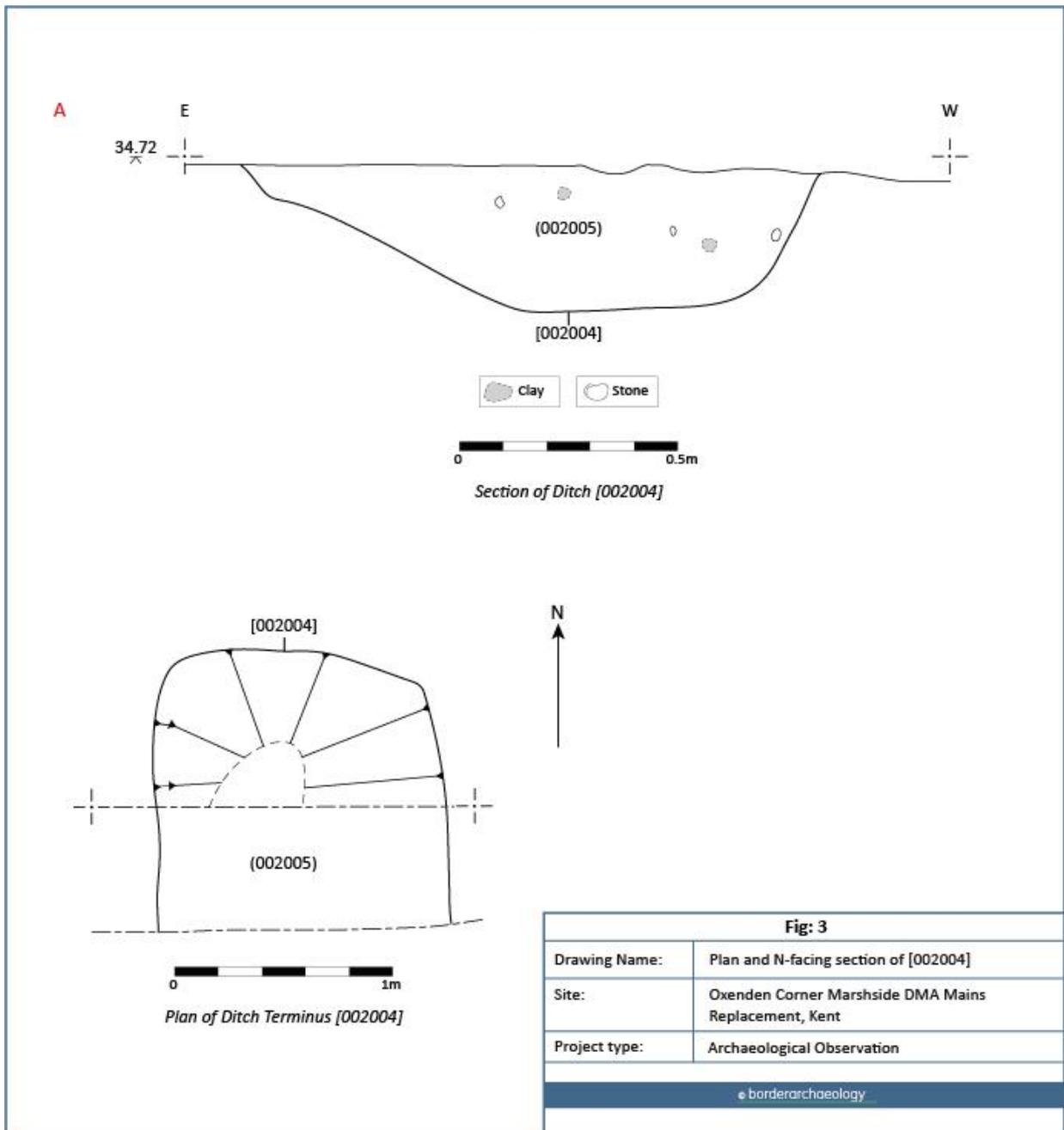
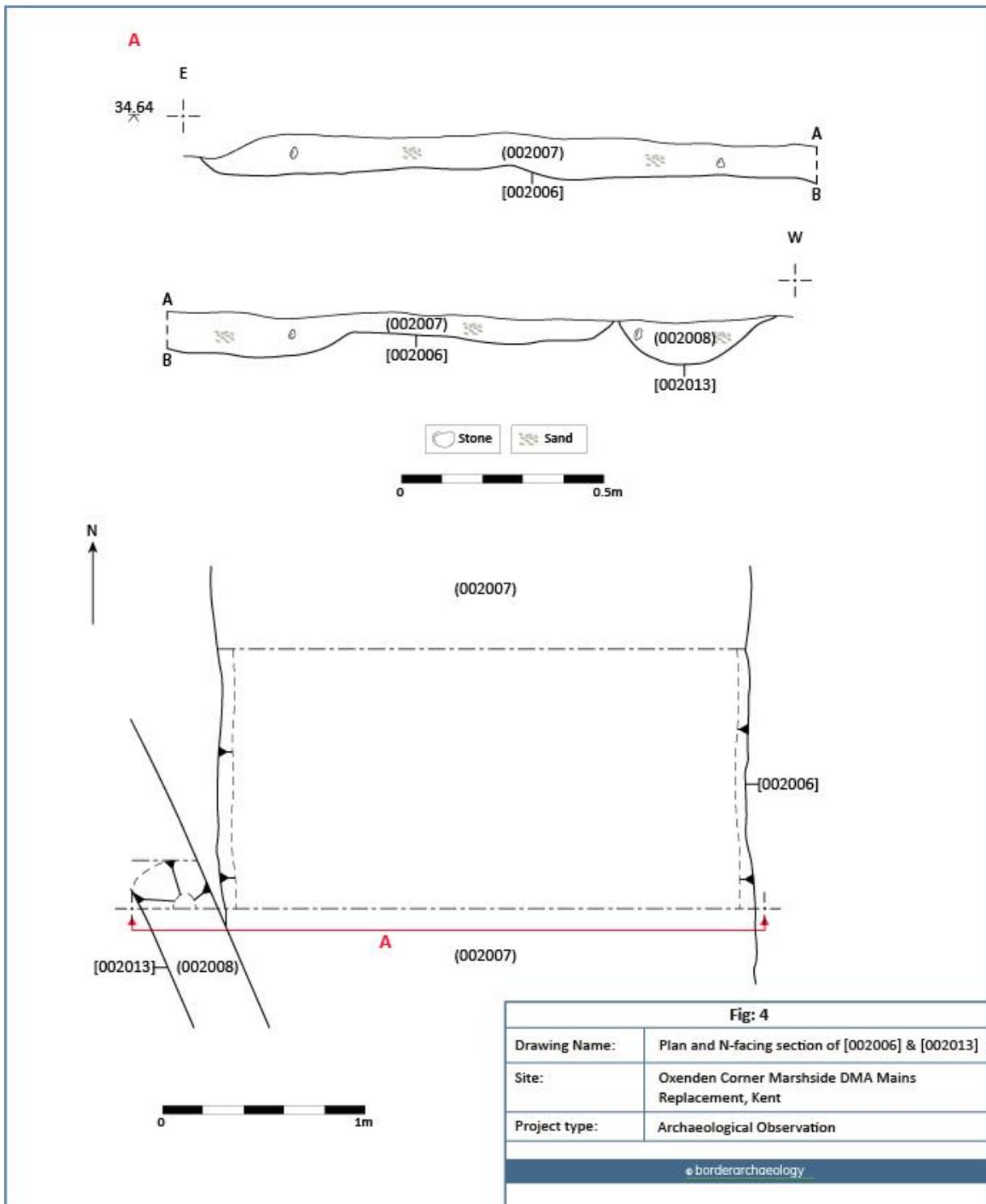




Plate 5: N-facing section of linear [002004] (002005) (1m scale & photo board)



Another N-S aligned linear feature was identified during the topsoil strip in Trench 002 positioned to the W of [002004], and seen to extend in both directions beyond the designated working area. Feature [002006] (*fig 4; plate 6*) measured 20m (l) × 2.57m (w) × 0.11m (d). The feature was very shallow, filled with a loose light grey-white sand with occasional flint pebble inclusions (002007). [002006] was seen (in plan) to be truncated by a modern dated plough scar [002013] (002008). The ephemeral nature and shallowness of this feature suggests that it may

represent the surviving basal portion of a field boundary ditch. The upper part of the feature may have been removed through ploughing activity associated with arable cultivation, known to have been in practice here since the post-medieval period, continuing to the present day. This feature could also represent the surviving remains of an earlier, post-medieval dated agricultural furrow. Either interpretation is plausible. No dating evidence was recovered from the fill of the feature.



Plate 6: N-facing section of slot through linear feature [002006] (002007) (1m scale & photo board)

Linear feature [002009] (*fig 5; plate 7*) was uncovered towards the ENE extent of Trench 002, almost in line with Ford Hill Road which follows the line of a known Roman road. [002009] measured 1.4m (l) × 0.69m (w) × 0.48m (d). It was aligned N-S, and appeared to extend beyond the limits of excavation to the N but seemed to feather out towards the S. A slot was excavated across the width of the feature and revealed a single fill comprising a firm light brown-grey sandy clay with occasional flint pebbles (002010) which appeared to have naturally silted. It had a slightly irregular U-shaped profile; the base being slightly flatter and sloping towards the E as opposed to having a more rounded base. No finds were recovered. The regularity of this feature in section, and its location close to the Roman road might infer an association between the two, [002009] potentially representing a roadside ditch. Whilst it is unusual perhaps that there was no evidence found for any dumped waste material, or incidental finds recovered from the fill, as might be expected were it a roadside ditch located along a prominent route (Margary's Route 110, connecting Sturry and the fort at Reculver), the lack of finds could be attributed to the size of the feature exposed within the trench. The feature does feather out to the S which may indicate that the ditch was not continuous and was more segmented along the route of the road if the two are associated. However, the short segment of the feature revealed during the groundworks, coupled with the lack of dating evidence means interpretation of this feature is limited.



Plate 7: S-facing section of [002009] (002010) (1m scale & photo board)

The largest linear feature exposed in Trench 002 was [002011] (*fig 6; plates 8-10*). This was observed extending across the designated working area, aligned NW-SE. The feature was bi-sected by the pipe-trench and was shown to have concave sides and a flat base with a width of 6.52m and maximum depth of 0.48m and filled by (002012), a loose light yellow-brown sand with moderate pebble and occasional cobble inclusions. The position of this large ditch feature appears to correlate with a large wide NW-SE aligned linear depression depicted on the available 1m DTM LiDAR satellite imagery (*fig 8*). The morphology of this feature and its position close to the line of a known Roman road suggests either a late prehistoric or, more likely, a Romano-British date though no finds material was recovered from the single fill.

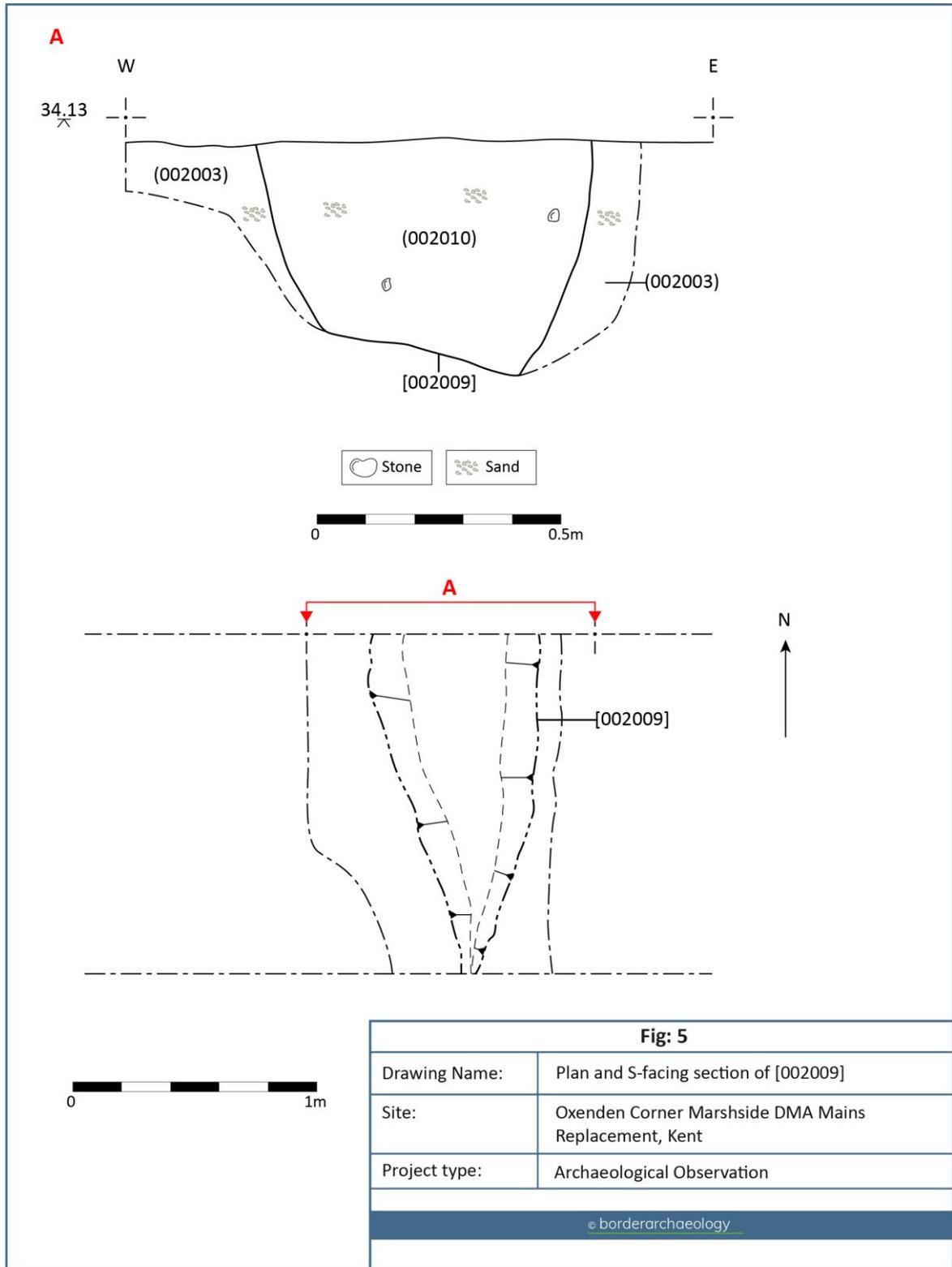




Plate 8: N-facing section showing western extent of [002011] (002012), (2m scale & photo board) (1/3)



Plate 9: N-facing section between W and E extent of [002011] (002012), (2m scale & photo board) (2/3)

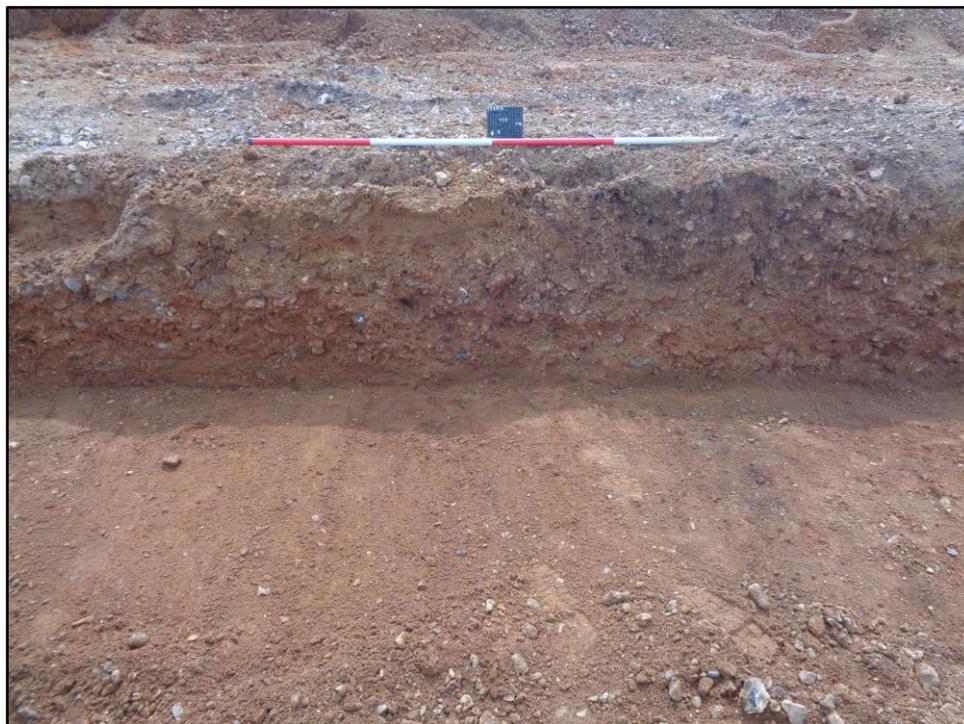
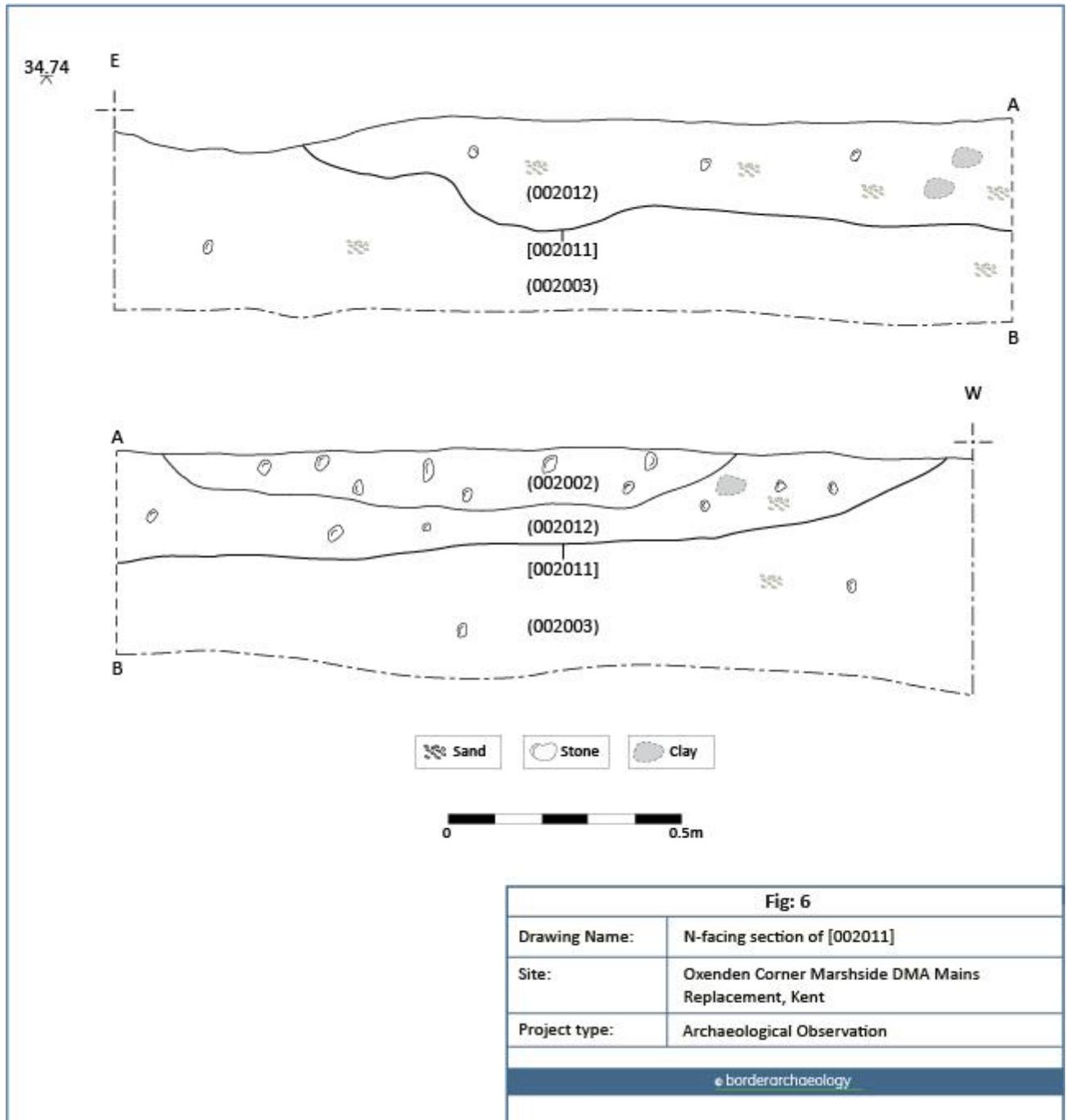


Plate 10: N-facing section showing eastern extent of [002011] (002012), (2m scale & photo board) (3/3)



7.3 Trench 003

A connection trench approximately 2.6m wide by 2m long was excavated at the WSW end of the pipeline route in Ford Road. This trench was located immediately SW of Trench 001.

Underlying the tarmac road surface, (003001), was a hard-core layer of loose light-yellow brown sand with frequent cobbles, (003002), up to 0.42m thick. The natural substrate (003003) was reached at a depth of 0.50m bgl and

comprised a loose mid orange-brown sand with frequent pebble and occasional cobble inclusions and was observed to the base of the trench.

No archaeological features or deposits were encountered within this trench.



Plate 11: NE-facing section of Trench 003 (1m scale & photo board)

7.4 Trench 004

Trench 004 extended ESE from Trench 002 for approximately 60m across Ford Hill road and along Highstead Road.

Underlying the tarmac road surface was hard-core layer (004002), comprising a firm light-yellow brown sand with frequent cobbles, 0.19m thick. This overlay a compacted mid red-brown sand with moderate pebble and cobble inclusions, (004003), a probable layer of redeposited natural associated with the carriageway construction, encountered at a depth of c. 0.40m bgl.

No archaeological features or deposits were encountered within this trench.



Plate 12: NNE-facing section of Trench 004 (1m scale & photo board)



Plate 13: NNE-facing section of Trench 004 (1m scale & photo board)

7.5 Trench 005

Trench 005 was positioned to the N of Trench 004 within the carriageway and grass verge on the W side of Ford Hill Road and measured approximately 1.5m (NE-SW) by 2.5m (NW-SE), excavated to a depth of 1.09m bgl.

A loose, dark grey brown silty clay topsoil (005001) with occasional flint pebble and cobble inclusions approximately 0.24m thick was removed within the grass verge area. A loose mid grey-brown silty clay subsoil (005002) with occasional flint pebble and cobble inclusions approximately 0.42m thick was observed directly below (005001) and the tarmac road surface. (005002) overlay the natural substratum (005003), a loose mid brown-orange sand with occasional flint pebble and cobble inclusions and patches of firm blue or orange clay encountered at a depth of c. 0.65m bgl.

No archaeological features or deposits were observed here.



Plate 14: SSW-facing section of Trench 005 (1m scale & photo board)

8 Significance of the Results

Trench 002 revealed a number of linear features, some of which may be significantly of prehistoric or Romano-British date. Ditch [002004] contained an abraded fragment of pottery, through sampling of the fill, which is considered to be of probable Iron Age date. Other findings from the palaeoenvironmental sampling did show inclusions of common weed materials, though nothing to support or suggest any nearby human activity. Given the paucity of dating evidence or palaeoenvironmental material, it is likely to represent agricultural features, such as

drainage ditches or boundary ditches. The ditch is likely to have silted naturally, and given that the pottery sherd is abraded, the possibility of the sherd being residual, a result of incidental deposition resulting from later dated agricultural activity, cannot be ruled out.

[002006] although ephemeral, owing to its location to the E of [002011] and west of [002004], appears to represent a NW-SE aligned linear field boundary, not shown on the 1877 Ordnance Survey 1st Edition map but depicted on the 1907 Ordnance Survey 3rd Edition map (*fig. 7*) running diagonally across the field, also visible on the 1m DTM LiDAR Survey image (*fig 8*). This feature appears to have been heavily truncated owing to intense modern ploughing activity.

Ditch [002009] was uncovered to the immediate W of Ford Hill Road and correlates with the line of a linear feature/ditch depicted on the 1m DTM LiDAR survey (*fig. 8*). Though no dating evidence was retrieved, its position parallel to, and in such close proximity to the road supports the theory of an association between the two. [002009] may have been established as a road-side ditch demarking the W side of the Roman road, and secondarily have functioned as a field boundary. Therefore, it may be interpreted as either the potential remains of a roadside- ditch associated with the Roman road or the remains of a relict field boundary.

Ditch [002011] seems to line up with the wide linear depression depicted on the 1m DTM LiDAR survey (*fig. 8*) located in the SW corner of Trench 002, Field 2. No dating evidence or finds were recovered to assist in the interpretation of function or date of the feature. The LiDAR image however shows that the feature lies to the immediate E of the western extent of a rectilinear enclosure, bi-sected by the line of Ford Hill Road with the remainder of the enclosure located to the E of the road. Given the enclosure ditch is bi-sected by the line of the Roman road it infers that the enclosure is of earlier date – either late prehistoric or perhaps of early Romano-British date. It is unclear the function of [002011] though an association with the enclosure ditch lying to the SW and S is probable.

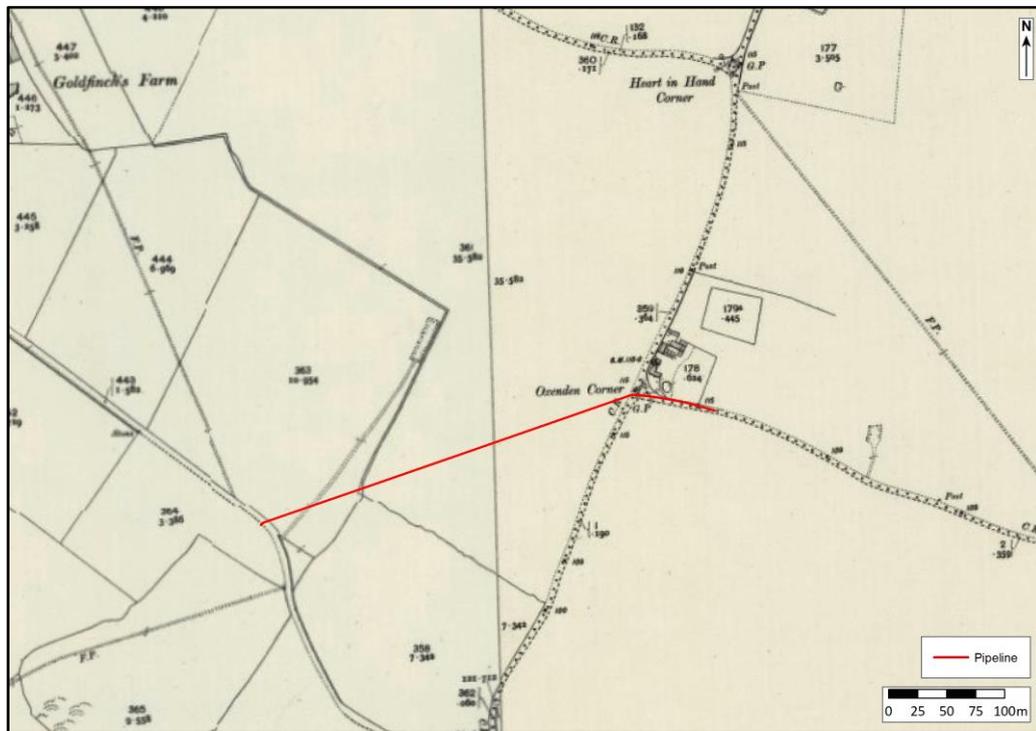


Fig. 7: Extract from the 1907 OS 3rd Edition 25-Inch Survey of Kent
(Reproduced courtesy of the National Archives)

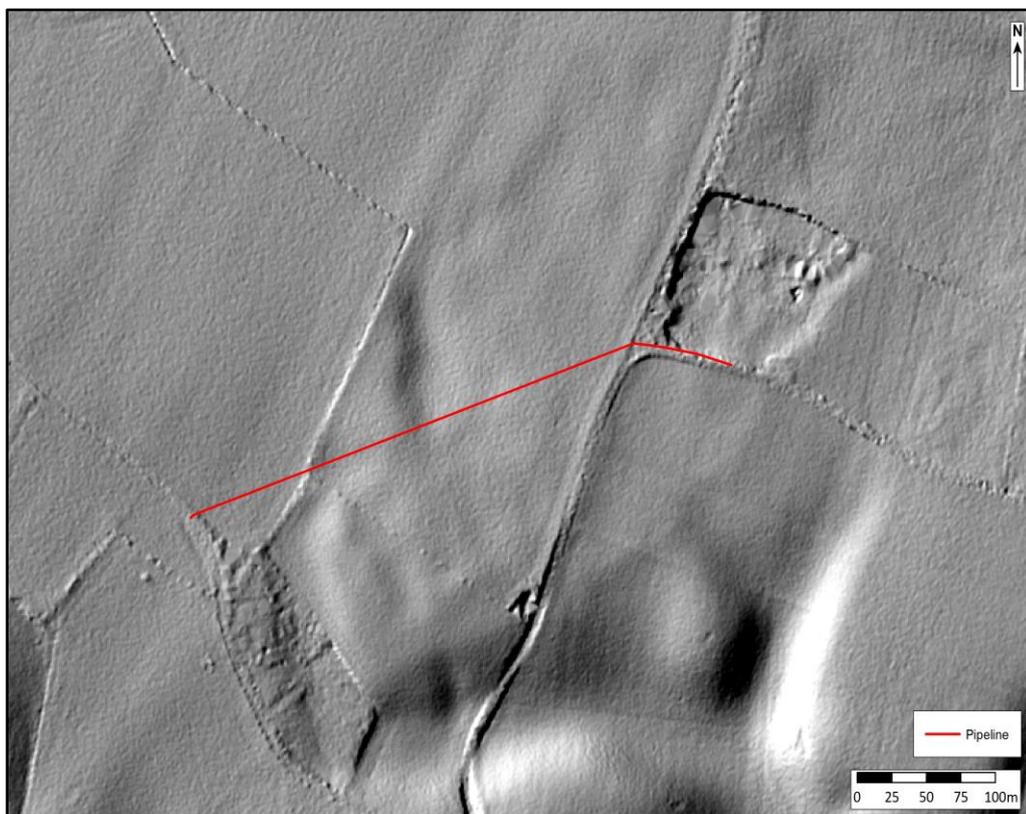


Fig. 8: Extract from Composite 1m DTM LiDAR Survey Data
(Reproduced courtesy of the Environment Agency)

9 Conclusion

Archaeological monitoring of the groundworks undertaken on the Oxenden Corner Marshside DMA Mains Replacement Scheme (13-1323) between May and June 2019 yielded evidence of possible Roman and Prehistoric activity, in the form of ditched features, some of which are visible in the landscape as cropmark features. Linear [002009] may represent a road-side ditch of Roman date which runs parallel to the present-day Ford Hill Road, known to follow the line of the earlier Roman road. Linear [002011] correlates with the wide linear depression observed on the 1m DTM LiDAR survey and is likely associated with the large rectilinear enclosure lying to the immediate SW and S of Field 002. Whilst linear [002011] may represent an internal feature to the rectilinear enclosure, its function could not be ascertained, although it does indicate there is at least some survival of below ground remains of these cropmark features, despite continuous ploughing activity here since the early post-medieval period. [002004] likely represents an agricultural ditch – possibly a boundary or drainage feature. The terminus might suggest the latter interpretation. Although a fragment of probable Iron Age pottery was recovered from the fill of the ditch, this appears more than likely to be residual and the feature therefore remains undated. Ditch [002006] appears to represent the truncated remains of a late 19th – early 20th century field boundary.

The palaeoenvironmental sampling undertaken produced no evidence for any environmental indicators of human activity or occupation within close proximity of these features.

Although the AO did not answer any of the research themes identified through the *SERF*, the fieldwork did confirm the presence of a large number of linear features some of which have been previously only identified through aerial photography and satellite imagery. It is hoped that the findings of this scheme may contribute to other archaeological investigations in the locality, in particular to any future investigations within the study area, more specifically within the fields lying to the W of Ford Hill Road.

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12 Appendix 1: Context Tables

12.1 Trench 001

Context	Slot	Type	F/B	F/O	Description	Interpretation	Finds	Sample No	Provisional Date
(001001)	-	Deposit	-	-	Loose; dark grey-brown; silty clay (80/20); occasional flint pebble and cobble inclusions; 0.34m thick; overlies (001002)	Topsoil	-	-	Modern
(001002)	-	Deposit	-	-	Loose; light orange-brown; silty clay (50/50); occasional flint pebble and cobble inclusions; 0.36m thick; underlies (001001); overlies (001003)	Subsoil	-	-	Modern
(001003)	-	Deposit	-	-	Loose; mid brown-orange; sand (50/50); occasional flint pebble and cobble inclusions and patches of firm clay; 0.73m -1.06m thick; underlies (001002)	Natural	-	-	Glacial

12.2 Trench 002

Context	Slot	Type	F/B	F/O	Description	Interpretation	Finds	Sample No	Provisional Date
(002001)	-	Deposit	-	-	Loose; dark grey-brown; silty clay (80/20); occasional flint pebble and cobble inclusions; 0.30m thick; overlies (001002)	Topsoil	-	-	Modern
(002002)	-	Deposit	-	-	Loose; light orange-brown; silty clay (50/50); occasional flint pebble and cobble inclusions; 0.29m-0.30m thick; underlies (001001); overlies (001003)	Subsoil	-	-	Modern

(002003)	-	Deposit	-	-	Loose; mid brown-orange; sand and clay (50/50); occasional flint pebble and cobble inclusions; 0.84m - 2.6m in depth; underlies (001002)	Natural	-	-	Glacial
[002004]	-	Cut	(002005)	-	Linear terminus; 1.32m (w) × 1m (l) × 0.34m (d); gradual break of slope top; irregular sides; gradual break of slope bottom; flat base; N-S orientation; underlies (002005); overlies (002003)	Cut of Linear Terminus	-	-	Unknown
(002005)	-	Fill	-	[002004]	Fill of linear terminus [002004]; Friable; light grey-white; clay sand (20/80); occasional flint pebble inclusions; 1.32m (w) × 1m (l) × 0.34m d; underlies (002002)	Fill of linear	-	002001	Unknown
[002006]	-	Cut	(002007)	-	Linear; 2.57m (w) × 0.11m d; gradual break of slope top; angular sides; gradual break of slope bottom; irregular base; N - S orientation; underlies (002007); overlies (002003)	Field Boundary	-	-	Late 19 th /early 20 th century
(002007)	-	Fill	-	[002006]	Fill of linear [002006]; light grey-white; sand (100); occasional flint pebble inclusions; 2.57m (w) × 1m (l) × 0.11m (d); underlies (002002); truncated by (002008)	Fill of field boundary	-	-	Late 19 th /early 20 th century
(002008)	-	Fill	-	[002013]	Plough scar deposit; loose; mid grey-white; silty sand (30/70); occasional flint pebble inclusions; 0.17m (w) × 1m (l) × 0.10m (d); overlies (002003); underlies (002002) truncates (002007)	Plough Scar	-	-	Modern
[002009]	-	Cut	(002010)	-	Cut of linear; 0.69m (w) × 1.40m (l) × 0.48m (d); sharp break of slope top; concave sides; sharp break of slope bottom; irregular base; N - S orientation; underlies (002010); overlies (002003)	Cut of Linear	-	-	Unknown
(002010)	-	Fill	-	[002009]	Fill of linear [002009]; firm; light brown-grey; sandy clay (40/50); occasional flint pebble inclusions; 0.69m (w) × 1.40m (l) × 0.48m (d); Underlies (002002); Overlies [002009]	Fill of linear	-	002002	Unknown
[002011]	-	Cut	(002012)	-	Cut of linear; 6.52m (w) × 0.48m (d); gradual break of slope top; concave sides; gradual break of slope	Cut of Linear	-	-	Unknown

					bottom; flat base; NW - SE orientation; underlies (002012); overlies (002003)				
(002012)	-	Fill	-	[002011]	Fill of linear [002011]; loose; light yellow-brown; sand (100); moderate pebble and occasional cobble inclusions; 6.52m (w) × 0.48m (d); underlies (002002); overlies [002011]	Fill of linear	-	-	Unknown
[002013]	-	Cut	(002008)	-	Cut of plough scar; 0.4m (w) × 1m (l) × 0.1m (d); moderate break of slope top; concave sides; gradual break of slope and concave bottom; orientated SSW - NNE; filled by (002008)	Cut of plough scar	-	-	Modern

12.3 Trench 003

Context	Slot	Type	F/B	F/O	Description	Interpretation	Finds	Sample No	Provisional Date
(003001)	-	Deposit	-	-	Tarmac; 0.08m thick; overlies (003002)	Tarmac	-	-	Modern
(003002)	-	Deposit	-	-	Hard; loose; light yellow-brown; sand; frequent cobbles; 0.42m thick; underlies (003001); overlies (003003)	Hard core	-	-	Modern
(003003)	-	Deposit	-	-	Loose; mid orange-brown; sand; frequent pebble and occasional cobble inclusions; 0.56m thick; underlies (003002)	Natural	-	-	Glacial

12.4 Trench 004

Context	Slot	Type	F/B	F/O	Description	Interpretation	Finds	Sample No	Provisional Date
(004001)	-	Deposit	-	-	Tarmac; 0.18m thick; overlies (004002)	Tarmac	-	-	Modern
(004002)	-	Deposit	-	-	Firm; light yellow-brown; silty sand; frequent pebble and moderate cobble inclusions; 0.19m thick; overlies (004003); underlies (004001)	Hard core	-	-	Modern
(004003)	-	Deposit	-	-	Firm; mid red-brown; sand; moderate pebble and cobble inclusions; 0.58m thick; underlies (004002)	made-ground; redeposited Natural	-	-	Modern

12.5 Trench 005

Context	Slot	Type	F/B	F/O	Description	Interpretation	Finds	Sample No	Provisional Date
(005001)	-	Deposit	-	-	Loose; dark-grey brown; clay silt (20/80); occasional pebble and cobble inclusions; 0.24m thick; overlies (005002)	Topsoil	-	-	Modern
(005002)	-	Deposit	-	-	Loose; mid grey-brown; clay silt (40/60); occasional pebble and cobble inclusions; 0.42m thick; overlies (005003); underlies (005001)	Subsoil	-	-	Modern
(005003)	-	Deposit	-	-	Loose; mid brown-orange; sand; occasional pebble and cobble inclusions; 0.43m thick; underlies (005002)	Natural	-	-	Glacial

13 Appendix 2: Pottery Report

Rob Perrin A. M.Litt. MCIfA. FSA

The single body sherd is small, just weighing a little over 7g, and abraded. It looks to be hand-made and the fabric contains small pieces of flint. There is a long tradition of flint-tempered pottery in Kent, lasting into the Roman period, though this sherd appears to be of Iron Age date, pre-Conquest, though just how early is uncertain.

14 Appendix 3: Palaeoenvironmental Report

Mark Villeneuve BSc

Border Archaeology

14.1 Non-Technical Summary

This report has been prepared by the Palaeoenvironmental Department at Border Archaeology (BA) to facilitate and elucidate the palaeoenvironmental, palaeoeconomic and palaeodietary interpretations of a sequence of features discovered during Archaeological Observation of water mains replacement at Oxenden Corner, Marshside, Broomfield, Herne Bay, Kent.

A total of two samples, comprising 80ℓ of material, were processed by flotation having originated from two ditch fills of unknown date.

Limited retrieval of significant material means little can be concluded about the ditches besides that they were likely isolated from human activity and have a largely natural signature.

14.2 Introduction

This report details the results derived from two samples, constituting a total of 80ℓ of soil, retrieved from two ditch fills.

In accordance with the WSI (BA, 2019), at least 40ℓ or 100% of the deposits were sampled. This resulted in two samples comprising 80ℓ of material being received by the Palaeoenvironmental Department with the resultant archaeological and archaeobotanical material sorted and identified.

The samples were processed by means of flotation and any potential archaeobotanical remains from both the floating element and the heavier residue/retent were sorted and visually identified. The nature and interpretative significance of the recovered remains is detailed in Section 14.5 below.

The two samples were taken in multiples of 10ℓ sample buckets and derived from two contexts from two features, from which 40ℓ each was taken. The results are presented by context in Section 14.6 below.

14.3 Site Description

The land comprising the observation covered two fields between Ford Road and Ford Hill Road and Highstead Road.

At the time of observation, the fields were under arable cultivation.

14.3.1 Soils and Geology

The surrounding geology of well drained loams (SSEW, 1983) would predispose the preservation of charcoal and other charred plant macrofossils.

14.4 Methodology

14.4.1 Objectives of analysis

The purpose of the palaeoenvironmental sampling strategy implemented during archaeological observation is the retrieval of non-specific palaeoenvironmental remains and the further characterisation of features that cannot be fully investigated due to the confines of the non-archaeological works. Information garnered should inform on the features revealed whose destruction was necessitated by works but monitored by the archaeologist.

14.4.2 Sampling methodology

Sampling methodology followed the *Palaeoenvironmental Department Manual* (BA, 2017) for environmental sampling and processing and with reference to Historic England guidance (Campbell, et al., 2011). On site, the samples were collected in sample buckets and identified by context and sample number. Following receipt into the Palaeoenvironmental Department, they were assigned bucket numbers for tracking purpose. The samples were not subject to sub-sampling and their entirety was processed by means of flotation.

Flotation was undertaken in Siraf-style tanks (Williams, 1973) with a 500µm retent mesh and 250µm flot sieve. No refloating was required for these samples. Retents were initially scanned by magnet to retrieve any archaeometallurgical debris and a sieve bank was used to facilitate visual sorting with the smaller fractions sorted by means of magnifying lamp and/or illuminated stereo zoom microscopy ($\leq \times 10$). The flots were sorted entirely by means of illuminated stereo zoom microscopy ($\leq \times 10$). The results of this analysis are reported with the flot and retent data recombined due to limited to no variance in the species being reported.

14.4.3 Personnel

Flotation and primary analysis were undertaken by staff within BA's Palaeoenvironmental Department under the guidance of Amy Bunce BSc MA ACIfA.

External and internal specialists were consulted for all archaeological finds and faunal material recovered from palaeoenvironmental samples. Archaeological, archaeometallurgical and archaeozoological assemblages from the palaeoenvironmental material were recombined with the full site assemblages to ensure unbiased and broader specialist reporting on those materials.

14.5 Description of Results

14.5.1 Description and implications of materials recovered

Detailed below are the general implications of the discovery of certain materials within the palaeoenvironmental samples. Section 14.6 details such information by context.

14.5.2 Finds

Archaeological finds within palaeoenvironmental samples are fairly common and help confirm that the sampling of the material was not biased in any manner.

In this instance, palaeoenvironmental sampling recovered a single sherd of pottery and very occasional ceramic building material (CBM).

14.5.3 Shell

Terrestrial shell comprises that from snails that may have been present in the area during deposition of the fills. Identification of the species represented highlights any ecological niches preferred by certain species in the environments they inhabited.

Archaeomalacological identification is undertaken in-house utilising reference texts (Cameron, 2008) (Evans, 1972) (Kerney & Cameron, 1979) (Welter-Schultes, 2012). Environmental interpretations were based upon a combined autecological and synecological approach as advised by Davies (Davies, 2008), using ecological groups for terrestrial and freshwater species as designated by Evans (Evans, 1972) and Sparks (Sparks, 1961) respectively. The ecological preferences of each species were inferred by reference to Kerney and Cameron (Kerney & Cameron, 1979) and the molluscs were identified on the basis of apical and other diagnostic fragments according to nomenclature by Welter-Schultes (Welter-Schultes, 2012).

Interpretations of palaeoenvironments using mollusca are limited by taphonomic uncertainty, due to the effects of gravity, bioturbation and re-deposition by hydrological processes affecting the distribution of shells within sediments, processes which are understood only superficially (Lowe & Walker, 1997). Additionally, only well-preserved shells are suitable for identification; therefore, the recovered fauna may not be representative of the true fauna. Limitations of autecology and synecology, relating to uniformitarianist assumptions, the poorly understood factors influencing the distribution of a particular species, the broad ranges of environments inhabited by many molluscan species (Davies, 2008), unknown associations between past molluscan fauna (Bush, 1988) and the lack of applicable modern analogues for past environments limits the extent with which palaeoenvironments can be reconstructed using this method.

A small number of *Cecilioides* sp. (Blind snail) were recovered, they are commonly found underground in the flood debris of rivers, being relatively catholic in their habitat requirements beyond being subterranean. Given the proximity to a watercourse and the well-drained geology, their presence is unsurprising and offers little further interpretation.

14.5.4 Charcoal

Charcoal is ubiquitous in palaeoenvironmental samples as it is used in domestic, funerary and industrial settings or may be present as a result of accidental firings. Identification of the wood species making up the charcoal assemblage can add valuable data as to wood selection for the varying purposes.

While often relied upon for dating, in particular C^{14} , charcoal is not the best material to use. Charcoal is subject to the 'Old Wood problem', whereby wood is known to be frequently reused and charcoal redeposited. In addition, wood grows over many years and it is not possible to know precisely where within the tree a charcoal fragment has derived.

Anthracological analysis is undertaken in-house by Amy Bunce BSc MA ACIfA additionally utilising reference keys (Hather, 2000) (Schweingruber, 1990) (Schweingruber, 1990). Anthracological analysis was generally undertaken at $\times 100$ magnification although higher magnifications to $\times 400$ were used where necessary. Lighting was by incident lighting with transmitted lighting where necessary. Charcoal was transversally sectioned with tangential or radial sectioning undertaken where required. Any waterlogged or otherwise preserved wood present would be presented in a separate Wood Identification and Technology report.

Growth ring curvature and diameter size was classified by reference to Ludemann-Nelle (L-N) templates (Ludemann, 2002) (Nelle, 2002) whereby classes I, II, III, IV & V represented diameters $< 20\text{mm}$, $20\text{-}30\text{mm}$, $30\text{-}50\text{mm}$, $50\text{-}100\text{mm}$ and $> 100\text{mm}$ respectively. Growth ring curvature was additionally classified by reference to Marguerie-Hunot (M-H) test cards (Marguerie & Hunot, 2007) whereby weak, moderate and strong curvature were categorised 1, 2 and 3 respectively.

Charcoal fragments were recovered through sampling, though they represent fragments too small identification.

14.5.5 Slag

Archaeometallurgical debris may be present in the form of unspecific slag fragments, diagnostic slag fragments, vitrified structures and, more commonly for environmental samples, as hammerscale of the spheroidal or flake variety. Slag may be retrieved from both the flot and retent; this apparent contradiction, in that slag would normally be too heavy to float, is due to vesicles containing air in the spheroidal hammerscale and the smaller fragments of slag. Droplets of slag become spheroidal if they cool while travelling through the air after having been propelled during iron working.

One fragment was recovered but adds nothing to the discussion.

14.5.6 Charred archaeobotanical material

Charred archaeobotanical material is generally the most illustrative palaeoeconomic remnant. Charring is generally accepted to be almost solely of anthropogenic origin and the material can therefore be used to directly reconstruct the past agricultural or consumer economy and diet. Caution must be taken by the intrinsic bias a charred assemblage presents over the uncharred plant remains of palaeoeconomic utility. However, such variance is built into the study of charred plant remains.

Archaeobotanical identification is undertaken in-house utilising reference texts that include the most valid to the British assemblages (Anderburg, 1994) (Berggren, 1969) (Berggren, 1981) (Groningen Institute of Archaeology, 2006-present) (Jacomet, 2006) (Martin & Barkley, 2000) (Renfrew, 1973) (Schoch, et al., 1988) with classification following Stace (Stace, 2010).

This assemblage was comprised a Caryophyllaceae (Pink family) seed, a *Galium* sp. (Bedstraw) seed and a *Polygonum* sp. (Knotweed) nutlet as well as one indeterminate charred seed and a quantity of *Chenopodium* sp. (Goosefoot) seeds. Since these represent common weed species, little can be inferred from the charred archaeobotanical assemblage.

14.6 Description of palaeoenvironmental remains by selected context

Detailed below are the palaeoenvironmental remains from each context, an assessment of the localised palaeoenvironment reconstruction is attempted. Results for all contexts can be observed in the tables in Section 5 below.

14.6.1 [002004]: (002005)

(002005) was the singular fill of undated ditch [002004]. Palaeoenvironmental material included the *Chenopodium* sp. (Goosefoot), *Galium* sp. (Bedstraw), *Polygonum* sp. (Knotweed) and sparse fragments of charcoal. It also included the slag and the pottery sherd. However, the low yield of common weed materials offers little toward interpretation and it is probable that the ditch was isolated from significant human activity.

14.6.2 [002009]: (002010)

(002010) was the singular fill of undated ditch [002009]. Palaeoenvironmental material included *Chenopodium* sp. (Goosefoot), Caryophyllaceae (Pink family), one indeterminate charred seed and a small assemblage of *Cecilioides* sp. snail shell. The depth of the feature and the readily draining soil would suit the catholic habitat requirements of *Cecilioides* sp. snails. The common weed genera offer little further interpretation. Significantly, the absence of charcoal fragments suggests a lack of human activity in the vicinity and points towards a natural accumulation of materials.

14.7 Table of results

The following table details the abundance results from both the archaeobotanical material and the archaeological finds. Weight and quantity records have been recorded but are not presented here due to the variation between materials.

Abundance key: + = rare; ++ = occasional; +++ = common; ++++ = abundant.

Context no.			002005	002010
Sample no.			002001	002002
No. of buckets			4	4
Sample vol. (mℓ)			40	40
% sample analysed			100	100
Waterlogged?			No	No
Refloated?			No	No
Latin name	Common name	Plant part		
Carbonised wild taxa				
Caryophyllaceae	Pink (family)	seed		+
<i>Chenopodium</i> sp.	Goosefoot	seed	+	+
<i>Galium</i> sp.	Bedstraw	seed	+	
<i>Polygonum</i> sp.	Knotweed	nutlet	+	
Indeterminate	Indeterminate	-		+
Charcoal				
Indeterminate <2mm	Indeterminate	fragments	+	
Indeterminate 2-4mm	Indeterminate	fragments	+	
Indeterminate >4mm	Indeterminate	fragments	+	
Archaeometallurgical				
Slag	-	-	+	
Artefactual				
Ceramic/pottery	-	-	+	
CBM	-	-		+
Molluscan				
<i>Cecilioides</i> sp.	Blind snail	-		+

14.8 Conclusions and recommendations

The non-specific palaeoenvironmental sampling provided little interpretative assistance to the archaeological conclusions. It can be suggested that the ditches were isolated from human activity in the landscape and may therefore represent land division boundaries or agricultural ditches.

14.8.1 Recommendations

Due to the nature of the materials recovered and full analysis undertaken, no further work is recommended.

Retention of the materials detailed above as an incorporation of the site archive for deposition with the museum is not recommended.

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