

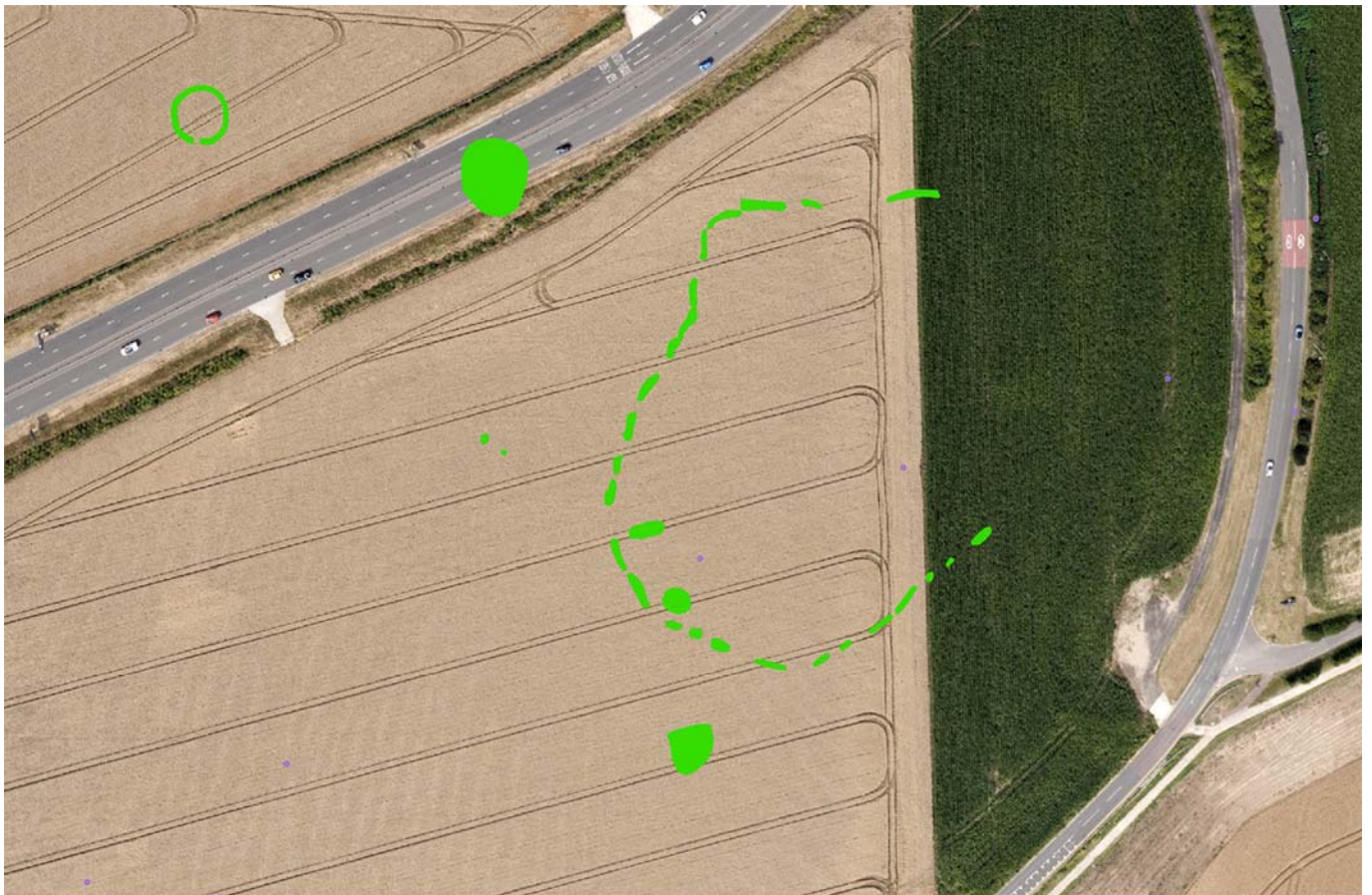


Historic England

Cropmarks of a Possible Neolithic Causewayed Enclosure at Cliffs End, Isle of Thanet, Kent

Fiona Small

Discovery, Innovation and Science in the Historic Environment



CROPMARKS OF A POSSIBLE NEOLITHIC CAUSEWAYED ENCLOSURE AT CLIFFS END, ISLE OF THANET KENT

Fiona Small

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SUMMARY

A possible Neolithic causewayed enclosure was observed on aerial photographs during the aerial survey component of the Ramsgate Heritage Action Zone survey of 2018-2019. Cropmarks indicate the buried remains of the enclosure near Cliffs End, Kent. It is recorded on aerial photographs taken by Historic England in 2017 and identified on two sets of aerial photographs taken in 2007 and 2017 held on Google Earth. The site is close to two excavated causewayed enclosures. If the site at Cliffs End is Neolithic in date, these represent a significant group of early and rare monuments.

CONTRIBUTORS

This report was written and researched by Fiona Small. All aerial photographic analysis and mapping was carried out by the author.

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ARCHIVE LOCATION

The Historic England Archive
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DATE OF SURVEY

August 2018

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CONTENTS

INTRODUCTION	1
A potential causewayed enclosure at Cliffs End.....	2
The enclosure	3
Other features near the enclosure.....	4
Sources for the causewayed enclosure	6
History of land use.....	9
Sources and Methods.....	10
Oblique Aerial photographs	10
Vertical Aerial Photographs	10
Environment Agency Lidar.....	11
Causewayed Enclosures- national background	12
Causewayed Enclosures in Kent	12
Court Stairs and Chalk Hill causewayed enclosures	14
Discussion	16

LIST OF FIGURES

- Figure 1 Aerial view of the arc of possible segmented ditches thought to represent the buried remains of a Neolithic causewayed enclosure visible as a faint cropmark. Also visible are the cropmark patterns of the underlying geology seen as parallel striations. HEA 33362_015 13-JUL-2017 © Historic England. 1
- Figure 2 The locations of the causewayed enclosures on the Isle of Thanet: Cliffs End (blue), Chalk Hill (red), Court Stairs (green) and the possible site at Margate (magenta). Ramsgate HAZ project area outlined is in red. Base map © Crown Copyright and database right 2019. All rights reserved. Ordnance Survey Licence number 100019088..... 2
- Figure 3 Plan of the possible causewayed enclosure and surrounding pits at Cliffs End mapped from Historic England Archive 33362_015 13-JUL-2017 and GOOGLE.EARTH 09-APR-2017. Three less certain segments of ditch were seen as faint cropmarks on Kent County Council vertical aerial photographs taken in 1990, accessible on Google Earth. Mapping © Historic England; Base map © Crown Copyright and database right 2020. All rights reserved. Ordnance Survey Licence number 100019088. 3
- Figure 4 Aerial photograph showing the possible causewayed enclosure at Lord of the Manor as an arc of interrupted ditches (dark green on green) against the background pattern/noise of geological markings. © GOOGLE.EARTH 09-APR-2017 4
- Figure 5 Faint pale cropmarks of an arc of interrupted ditches and pits of a possible Neolithic causewayed enclosure between Cliffs End and Lord of the Manor. North is to the bottom of the photograph. HEA 33362_015 13-JUL-2017 © Historic England..... 5
- Figure 6 Mapped cropmarks of a possible causewayed enclosure in relation to the deeper soil in Hollins Bottom dry valley potentially masking the eastern side of the enclosure if it extended further east and completed the circuit. Archaeological mapping © Historic England; Base map © Crown Copyright

and database right 20209. All rights reserved. Ordnance Survey Licence number 100019088.	6
Figure 7 Mapping of the causewayed enclosure from aerial photographs, overlaid on the Lidar 16 direction visualisation DTM tiles. There are no surface traces of the enclosure ditches or any other features within the field. The cropmarks indicating the eastern side of the enclosure peter out at the western edge of the north-south aligned dry valley – Hollins Bottom. LIDAR TR3564 Environment Agency DTM 2017. Archaeological mapping ©Historic England.....	7
Figure 8 Extract of mapped archaeological features between Cliffs End and Ramsgate visible on aerial photographs and lidar, illustrating the locations of the two known and third potential Neolithic causewayed enclosures (ringed). Archaeological mapping © Historic England; Base map © Crown Copyright and database right 2019. All rights reserved. Ordnance Survey Licence number 100019088.....	8
Figure 9 Google Earth image dated 21 April 2007show very faint traces of part of the south-western circuit of segmented ditches, a pit and the large natural pit to the north-west excavated during the East Kent Access Road development. © GOOGLE.EARTH.CPM 4/21/2007 ACCESSED 30-APR-2018	11
Figure 10 The outlines of all possible and certain causewayed enclosures currently identified in Kent transcribed from aerial photographs or from excavation plans. Archaeological plans © Historic England; base maps © Crown Copyright and database right 2019. All rights reserved. Ordnance Survey Licence number 100019088.....	13
Figure 11 Extract of aerial photograph NMR TR366/6/1059 06-AUG-1986 showing the faint cropmarks (left) and the same photograph with the transcribed remains of the circuit of segmented ditch of Chalk Hill Neolithic causewayed enclosure (right).This illustrates the difficulty in identifying these sites and the often slight nature of the cropmark in comparison with the remains surviving beneath the surface. © Historic England; © Crown	

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INTRODUCTION

A possible Neolithic Causewayed enclosure was identified near Cliffs End, Kent from aerial photographs during the course of Historic England's Ramsgate HAZ survey in 2018 (Small and Barber 2019). The site was seen on aerial photographs taken the previous year as part of the Historic England Aerial Reconnaissance Programme. The enclosure lies on the western side of a shallow south-facing chalky valley overlooking Pegwell Bay, with the English Channel beyond. The remains of two further causewayed enclosures have already been identified to the east at Chalk Hill and Court Stairs on the outskirts of Ramsgate (Clark et al 2019, 84-85; Moody 2008, 66-8).

Causewayed enclosures represent one of the earliest class of monument built in the British Isles, and due to their relative rarity, the discovery of a potential causewayed enclosure in close proximity to two other sites is important.



Figure 1 Aerial view of the arc of possible segmented ditches thought to represent the buried remains of a Neolithic causewayed enclosure visible as a faint cropmark. Also visible are the cropmark patterns of the underlying geology seen as parallel striations. HEA 33362_015 13-JUL-2017 © Historic England.

A potential causewayed enclosure at Cliffs End

The site is located at Cliffs End, to the west of Ramsgate, lying in a single large field to the south-west of Lord of the Manor roundabout on the recently completed East Kent Access Road at TR 3539 6479. The underling geology is Cretaceous Margate Chalk overlain with variable depths of Quaternary Head deposits of silt and clay (BGS 2020).

The site was identified from aerial photographs taken in 2017 by Historic England in advance of the Ramsgate HAZ project, as part of the HE Aerial Reconnaissance Programme. The enclosure can also be seen on photographs on Google Earth dated 9th April 2017 (last accessed 16th May 2019) and 16th May 2019 (accessed 19th October 2020). Slight and ambiguous traces have subsequently been identified on earlier photographs already held in the Historic England Archive.



Figure 2 The locations of the causewayed enclosures on the Isle of Thanet: Cliffs End (blue), Chalk Hill (red), Court Stairs (green) and the possible site at Margate (magenta). Ramsgate HAZ project area outlined is in red. Base map © Crown Copyright and database right 2019. All rights reserved. Ordnance Survey Licence number 100019088.

The enclosure

The enclosure appears as a cropmark of an irregular incomplete circuit of segmented ditches. These partially enclose an area, open to the east, that measures about 140m north to south and at least 100m east to west. The eastern portion may be masked beneath or within deeper head sediments which have accumulated in Hollins Bottom, the dry valley which runs north-south immediately to the east of the site. This band of deeper soil is visible as a dark cropmark recorded on a number of aerial photographs (see figure 6).

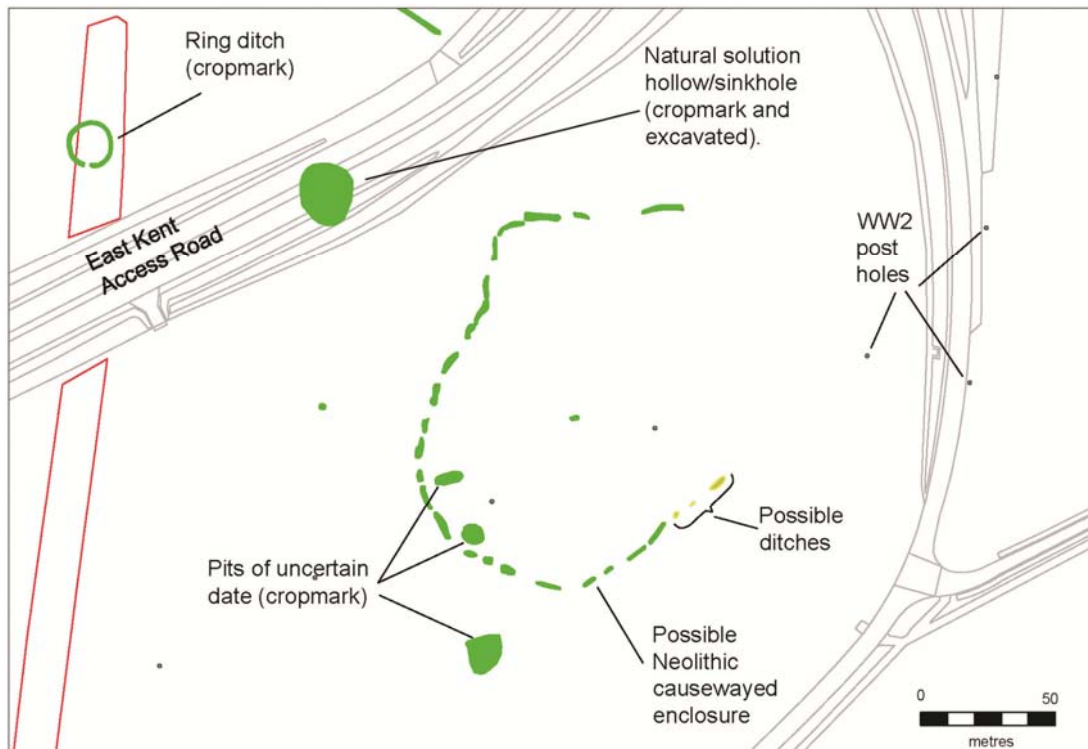


Figure 3 Plan of the possible causewayed enclosure and surrounding pits at Cliffs End mapped from Historic England Archive 33362_015 13-JUL-2017 and GOOGLE.EARTH 09-APR-2017. Three less certain segments of ditch were seen as faint cropmarks on Kent County Council vertical aerial photographs taken in 1990, accessible on Google Earth. Mapping © Historic England; Base map © Crown Copyright and database right 2020. All rights reserved. Ordnance Survey Licence number 100019088.

Twenty-three segments of ditch are visible on recent photographs with three further possible sections of ditch seen in the SE quadrant of the enclosure on photographs taken in 1990.

The ditch segments, in common with most causewayed enclosures, appear to have no uniformity in shape and size. They range in length from 3.3m to 13m and vary in width from 1m to 3m. It is possible the ditches were constructed in a single phase or are conglomerations of numerous intercut pits as found at other sites such as Chalk Hill (Clark et al 2019, 84-85) although this distinction is not visible on the aerial photographic evidence. Most ditches are separated from the adjacent segment by a clearly defined causeway or gap. These are also of variable length and measure between 0.3m and 8.6m, with some almost touching the adjacent ditch.

The northern side of the enclosure appears to comprise a short straight stretch where the ends of two ditch segments turn inwards to flank a 20m wide causeway, perhaps indicating the location of an entrance.



Figure 4 Aerial photograph showing the possible causewayed enclosure at Lord of the Manor as an arc of interrupted ditches (dark green on green) against the background pattern/noise of geological markings.
© GOOGLE.EARTH 09-APR-2017

Morphologically, the cropmarks of this potential causewayed enclosure at Cliffs End appear very similar to those of the nearby Chalk Hill enclosure. This appeared on aerial photographs as a faint cropmark of a single arc of interrupted ditches, with no hint of the underlying complexity of the site. Excavation in 1997 (ibid) revealed multiple circuits of interrupted ditches and further unrelated features from multiple phases. This underlying complexity is almost certainly the case at the Cliffs End site. The suggested causewayed enclosure at Court Stairs is only known from excavation of two segments of ditch with no indication of the true extent or morphology of the enclosure (Moody 2008, 66-8).

Other features near the enclosure

Cropmarks indicate the buried remains of two large pits, of uncertain date and origin, located close to the inner side of the arc of segmented ditches and a larger pit to the south of the enclosure. These and other smaller pits across the site may be either archaeological or geological in origin.

RAF photographs taken in 1942 recorded lines of posts erected during the Second World War in several of the large open fields to the west of Ramsgate. These were anti-invasion structures designed to deter enemy planes and gliders from landing. A number of these posts extended across the area of the causewayed enclosure. Though small, the pits left by these posts may be detected if the site was to be excavated in the future.

On many of the aerial photographs showing the site as a cropmark there is a background pattern of parallel marks in the cropmark. This effect is caused by grooves or striations on the surface of the chalk bedrock beneath the soil. Slightly deeper soil has accumulated in the grooves in the same manner as the buried ditches creating a darker cropmark.

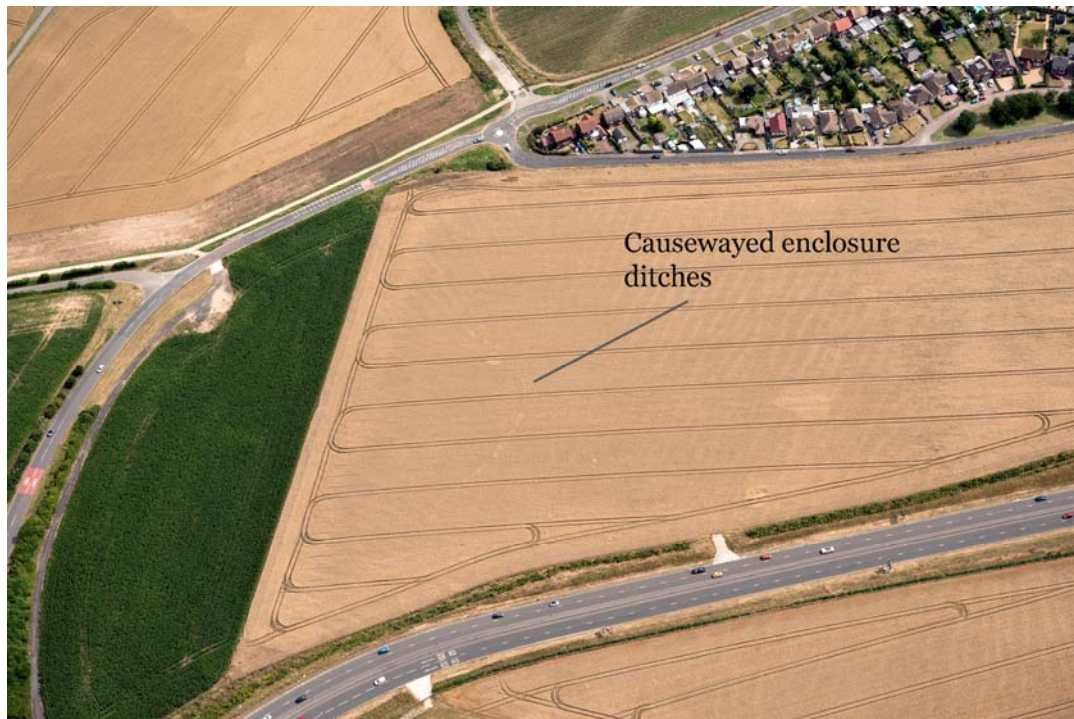


Figure 5 Faint pale cropmarks of an arc of interrupted ditches and pits of a possible Neolithic causewayed enclosure between Cliffs End and Lord of the Manor. North is to the bottom of the photograph. HEA 33362_015 13-JUL-2017 © Historic England.

Sources for the causewayed enclosure

The majority of the site was mapped from aerial photographs taken in 2017 by Historic England and Google Earth. Faint traces of at least three further ditch segments in the vicinity of the south-eastern side of the enclosure bordering the western edge of Hollins Bottom were seen on vertical photographs supplied commercially to Kent County Council in 1990, available through Google Earth. These could not be seen on the later photographs. Faint traces of parts of the enclosure were also identified on a number of older vertical aerial photographs taken for non-archaeological purposes, but were too fragmented and indistinct to have identified the site as a causewayed enclosure.



Figure 6 Mapped cropmarks of a possible causewayed enclosure in relation to the deeper soil in Hollins Bottom dry valley potentially masking the eastern side of the enclosure if it extended further east and completed the circuit. Archaeological mapping © Historic England; Base map © Crown Copyright and database right 20209. All rights reserved. Ordnance Survey Licence number 100019088.

It is evident from the combined photographic, map and lidar data, that the area has been cultivated for many centuries, particularly since the Second World War, resulting in few surviving archaeological earthworks across the Isle of Thanet. The field containing the remains of the possible causewayed enclosure appears smooth and featureless, probably from prolonged ploughing. Although there are no obvious surface features visible, the cropmarks indicate that sub-surface remains survive and potentially contain finds and dating evidence to confirm the nature of the site.

The lidar visualisations illustrate the topography of the north-south aligned dry valley on the eastern edge of the field, the western edge of which coincides with the petering out of the cropmarks seen on the aerial photographs. The ground surface in the region of Hollins Bottom does not appear to have the same smooth surface as the rest of the field. Aerial photographs taken during the construction of the relief road indicated the eastern part of the field was disturbed, possibly subject to some degree of earth moving (APGB flown 21-APR-2007).

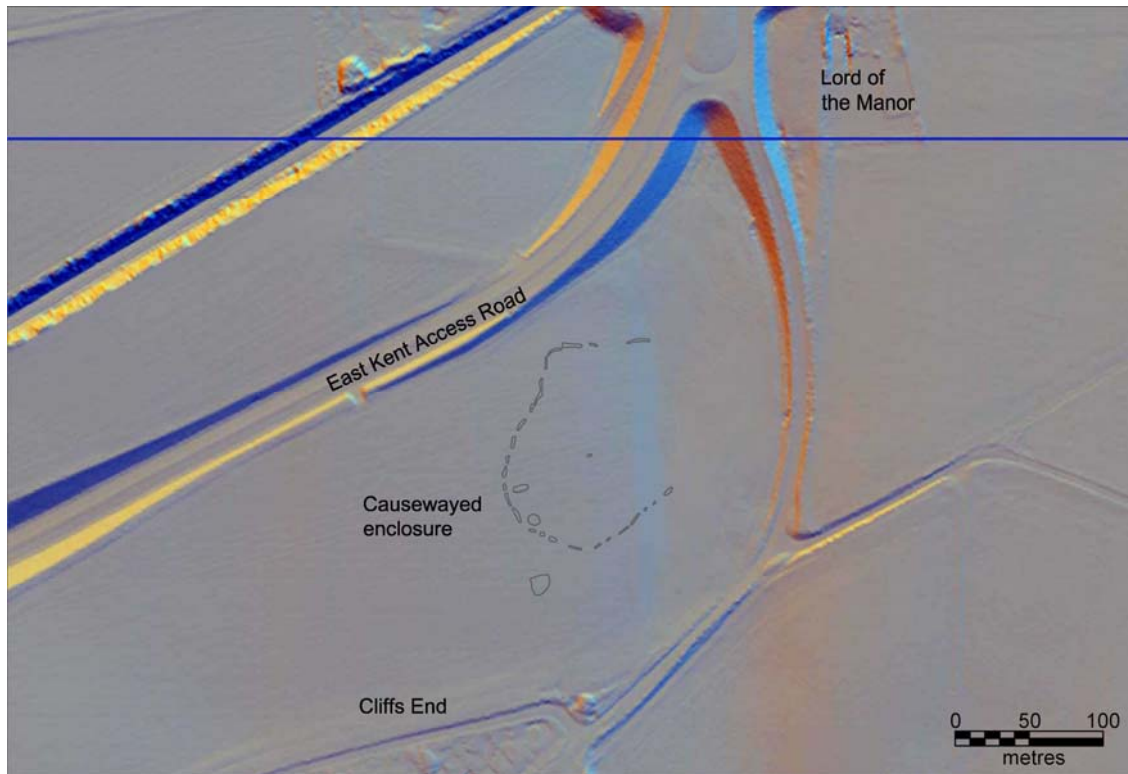


Figure 7 Mapping of the causewayed enclosure from aerial photographs, overlaid on the Lidar 16 direction visualisation DTM tiles. There are no surface traces of the enclosure ditches or any other features within the field. The cropmarks indicating the eastern side of the enclosure peter out at the western edge of the north-south aligned dry valley – Hollins Bottom. LIDAR TR3564 Environment Agency DTM 2017. Archaeological mapping ©Historic England.

Previous Investigations on the site

With the exception of the excavations carried out for the East Kent Access Road, there are no records of finds or excavations (either antiquarian or more recent investigations) held by Kent HER or reported upon by the local archaeological societies within the field containing the possible causewayed enclosure.

The area of the possible causewayed enclosure was surveyed from aerial photographs various times but none of the photographic sources available at the time of these surveys showed the possible causewayed enclosure site or any parts of the site clearly enough to identify the enclosure. The area was surveyed by the Royal Commission on the Historical Monuments of England (RCHME) as part of a

pilot aerial mapping survey of the entire county of Kent carried for the National Mapping Programme in the late 1980s (RCHME 1989). This used oblique aerial photographs held by the RCHME and Cambridge University Collection of Aerial Photography (CUCAP). More recently, the area was included in the SERCZAS (South East Rapid Coastal Zone Assessment Survey), a survey of the coastal regions of Britain which utilised a wider range of aerial sources including oblique photographs and vertical aerial photographs from the RAF and a number of commercial aerial photographic sources held by English Heritage and Kent County Council (Hamel and Lambert 2011).

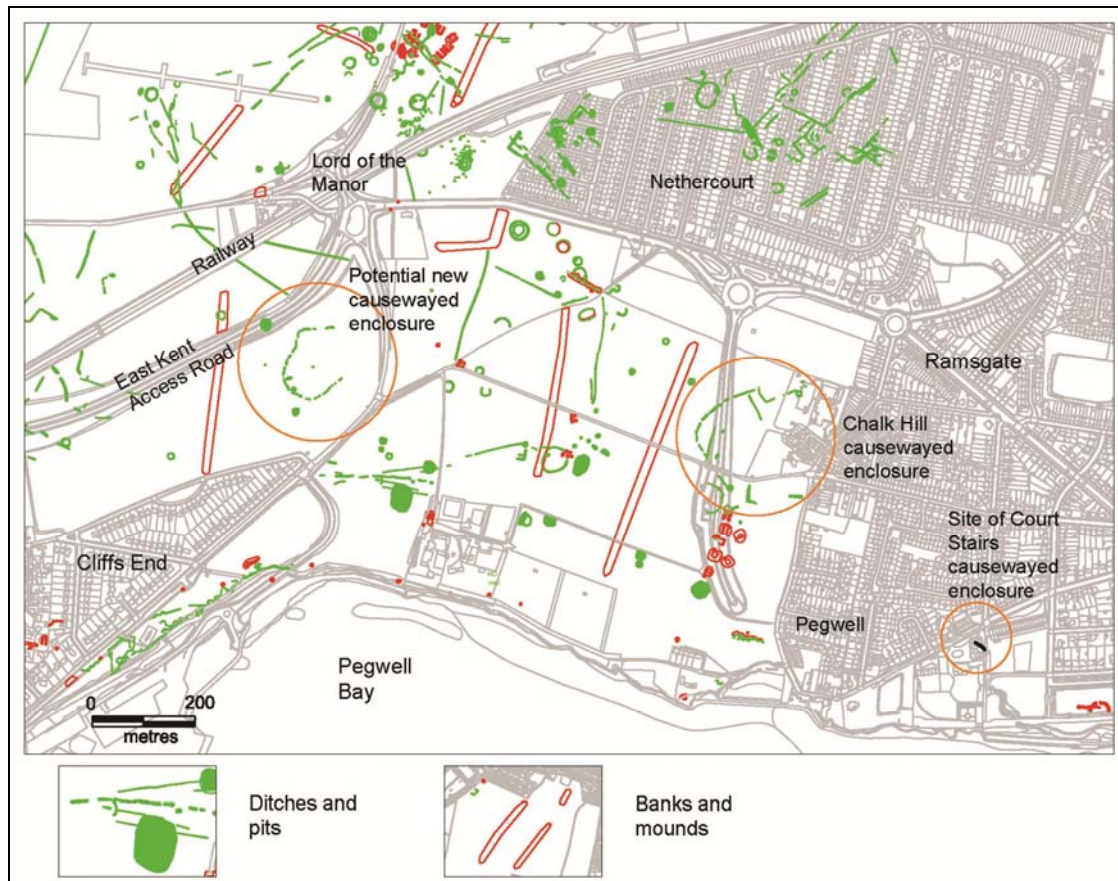


Figure 8 Extract of mapped archaeological features between Cliffs End and Ramsgate visible on aerial photographs and lidar, illustrating the locations of the two known and third potential Neolithic causewayed enclosures (ringed). Archaeological mapping © Historic England; Base map © Crown Copyright and database right 2019. All rights reserved. Ordnance Survey Licence number 100019088.

The swathe of land taken in for construction of the East Kent Access road passes just to the north of the site within 30m of the segmented ditches defining the northern side of the enclosure. Excavations along the road construction corridor encountered a number of features from a range of periods, particularly a number of Neolithic pits containing struck flints and pottery, traces of later prehistoric settlement and early medieval ('Saxon') pits and burials. One of the largest single features excavated in this area was a natural solution hollow or sinkhole in the chalk measuring 21m by 24m (Site 259336, Andrews *et al* 2015). This feature is visible

as a dark oval cropmark on aerial photographs taken prior to the road development north-west of the enclosure, now lying entirely beneath the course of the road.

History of land use

The lack of surviving upstanding earthworks in the field containing the causewayed enclosure at Cliffs End, and across Thanet as a whole suggests a long history of ploughing for cultivation. Aerial photographs taken at intervals from 1941 onwards show the field in arable cultivation, either as a single field or sub-divided into two or more arable regimes.

The lidar data for the field indicates there is no discernible earthwork surface trace of the possible causewayed enclosure, but the cropmarks caused by the enclosure ditches indicate they survive below the surface. Excavation at the Court Stairs site found traces of buried ditches cut into the chalk bedrock to a substantial depth in an area with a levelled and terraced surface (Moody 2008, 66-8). If the enclosure extended into Hollins Bottom to the east there is greater potential for sub-surface survival of ditches in the deeper deposits of soil and alluvium which have accumulated there.

Sources and Methods

The main source of aerial photographs was the Historic England Archive (HEA). The Cambridge University Collection of Aerial Photographs (CUCAP) is currently closed so a number of key photographs seen during earlier surveys were not available. Historic England Archive holds a few selected prints from the Cambridge University collection.

Online sources such as Google Earth which includes photographs from Kent County Council were also consulted and proved to be one of the primary resources for this survey. These were dated 1990, 2007, 2017 and 2019.

Geo referenced and rectified digital images were produced from oblique photographs from the Historic England Archive: HEA 33362_015 13-JUL-2017 using the University of Bradford AERIAL 5.36 rectification programme.

Archaeological features were digitally transcribed in AutoCAD 2019 using Historic England mapping conventions (see Appendix 1).

Oblique Aerial photographs

All available oblique aerial photographs held by Historic England Archive which covered the site of the possible enclosure were consulted. The site was identified on one set of oblique photographs taken by Historic England during aerial reconnaissance in advance of the Ramsgate HAZ survey on 13 th July 2017.

Vertical Aerial Photographs

Vertical aerial photography of the area has been carried out at intervals since 1941 by the RAF for reconnaissance, the Ordnance Survey and non-archaeological survey companies mainly for topographical mapping and planning purposes. These are held by the Historic England Archive.

Georeferenced digital images were supplied to Historic England through the Air Photography for Great Britain agreement by Next Perspectives, flown 21-APR-2007.

Free online sources of aerial photography including Google Earth (which included a photomosaic of photographs from Kent County Council taken in 1990) and Bing Maps, were also consulted.

The site is not clearly visible on any of these sources until 2017 when it is recorded for the first time on the aerial photographic mosaics on Google Earth. The cropmarks were not noted or identified as a potential archaeological site until the Historic England Ramsgate HAZ survey was undertaken in 2018. Faint cropmark traces of a few of the ditch segments and a pit in the south-western section of the circuit have been identified on Google Earth images taken in 2007, but possibly not

clear enough to identify the site without prior knowledge of its existence (see below).

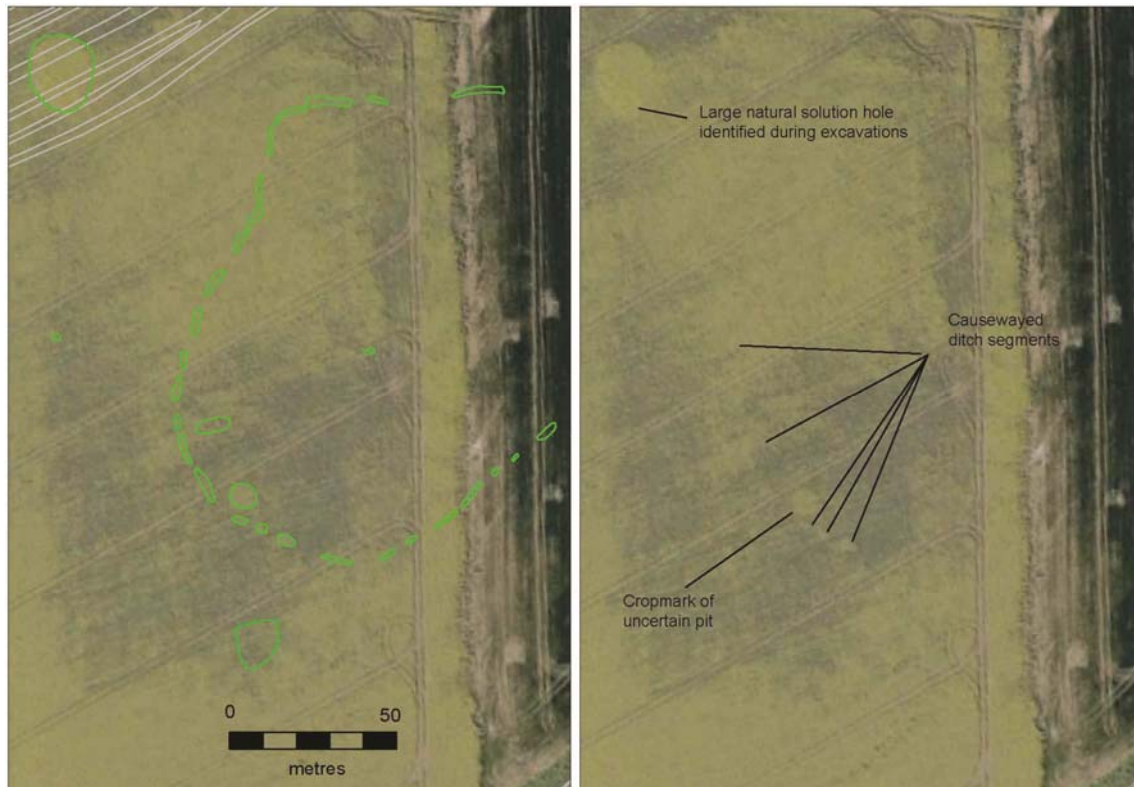


Figure 9 Google Earth image dated 21 April 2007 show very faint traces of part of the south-western circuit of segmented ditches, a pit and the large natural pit to the north-west excavated during the East Kent Access Road development. © GOOGLE.EARTH.CPM 4/21/2007 ACCESSED 30-APR-2018

The key aerial photographs used for this survey are:

33362_015 13-JUL-2017 Historic England Archive
Google Earth Uncertain day/month -1990 (Kent County Council)
Google Earth 09-APR-2017 and 30-APR-2018

Environment Agency Lidar

In addition to the aerial photographs, the survey also utilised available Environment Agency airborne laser scanning data (lidar) captured and supplied through Geomatics as 1m resolution ASCII data. This data was converted to a number of different geo-referenced visualisations, using the Relief Visualization Toolbox (RVT 1.1) developed by the Institute of Anthropological and Spatial Studies of the Research Centre of the Slovenian Academy of Sciences and Arts (ZRCSAZU) funded through the Slovenian Research Agency and ArchaeoLandscapes Europe project (Kokalj and Somrak 2019; Zakšek, Oštir and Kokalj 2011).

Causewayed Enclosures- national background

Nationwide, causewayed enclosure are a rare class of monument, and are largely found in England to the south of the River Trent, with a few scattered outliers identified in Wales, Scotland, Ireland and Cumbria (Historic England 2011). They are thought to date from the late 38th century BC, flourishing between the 37th-36th centuries before tailing off in the mid to late 36th century BC (Whittle *et al* 2001). A small handful of sites saw some continued activity into the 34th-33th centuries BC (ibid).

Causewayed enclosures represented one element of a new set of cultural changes including new technologies and the introduction of farming which arrived with incomers to southern Britain around 6000 years ago. The region of Kent has some of the earliest identified Neolithic sites suggesting this was the first point of contact and a route into the rest of Britain (Whittle *et al* 2011, 383).

Causewayed enclosures are the earliest known instances of enclosure of space in Britain, the defining features of which are single or multiple concentric circuits of segmented ditches (and in some cases, banks) separated by gaps or causeways with a characteristic lack of symmetry in the overall plan (Barnatt and Moir 1984). They vary in completeness and size – from less than 1 ha to around 27 ha in area. In some excavated instances, the bank had evidence of reinforcement or embellishment with a timber structure (Oswald *et al* 2001, 46).

Only a small number survive as earthworks (15 out of around 80 reviewed in Oswald *et al* in 2001). Most have been discovered from the air as cropmarks, and their identification is mainly based on their distinctive form (Oswald *et al* 2001, 54; Whittle *et al* 2011).

They have been found in three broad topographical zones – river valley floor, river valley side and upland locations. Those located in lowland contexts are frequently located close to rivers or streams or associated with springs and confluences of rivers (Oswald, 2001, 91).

Causewayed Enclosures in Kent

Until relatively recently, there were no confirmed Neolithic causewayed enclosures in Kent, apart from an uncorroborated and vague reference to a possible and since lost site at Chalk near Gravesend, (Barber 1997). Barber states that “As a whole, the Neolithic period in Kent was represented by a slowly increasing number of finds and sites, often with uncertain or ambiguous relationships to one another” (ibid). Since this paper was written, five causewayed enclosures have been recognised in Kent seen either as cropmarks on aerial photography and/or encountered during excavation.

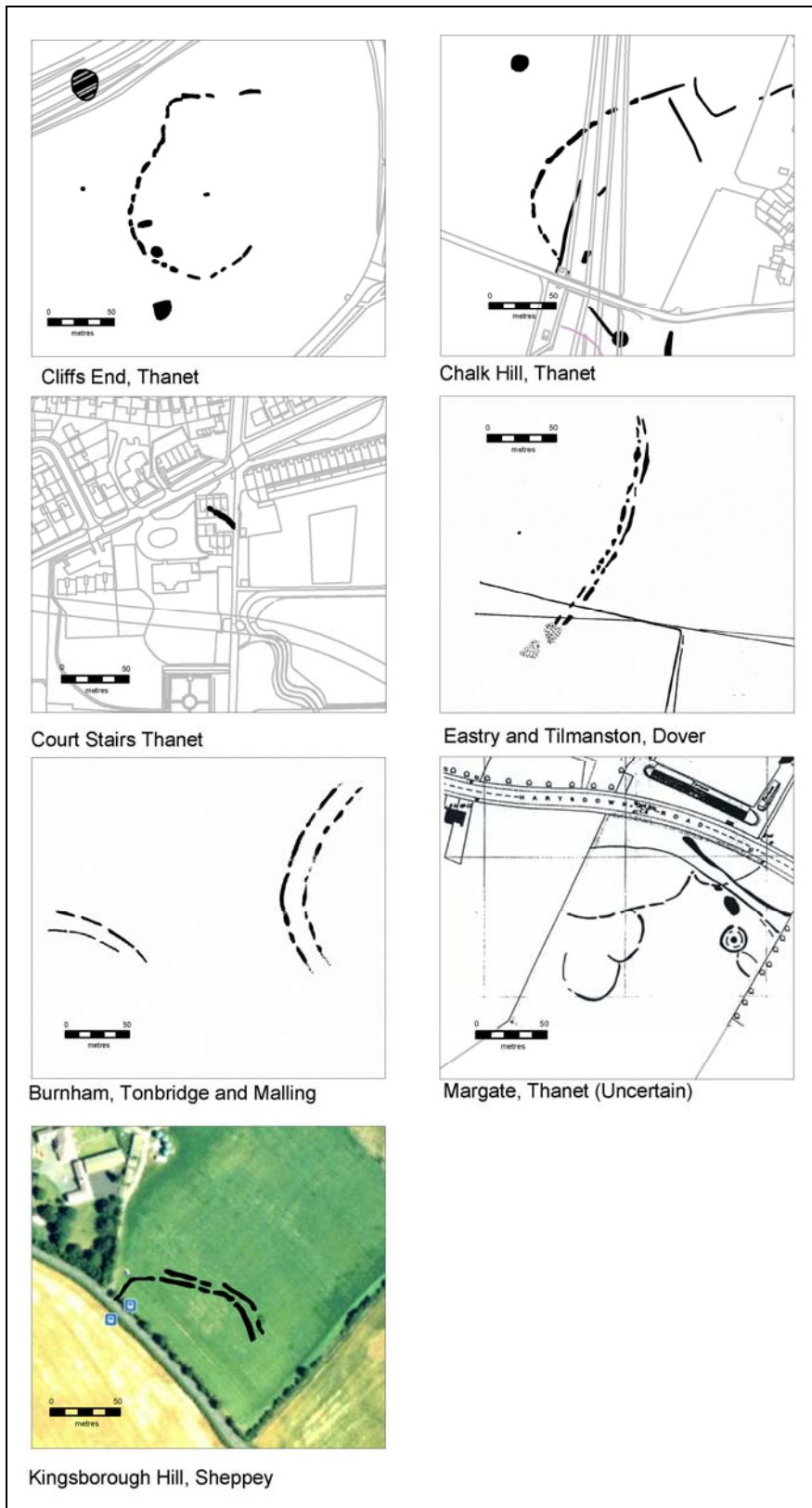


Figure 10 The outlines of all possible and certain causewayed enclosures currently identified in Kent transcribed from aerial photographs or from excavation plans. Archaeological plans © Historic England; base maps © Crown Copyright and database right 2019. All rights reserved. Ordnance Survey Licence number 100019088

The confirmed sites included Court Stairs on the western edge of Ramsgate and Chalk Hill just the west. Chalk Hill was first detected by RCHME/English Heritage in 1996 on archive aerial photographs taken in 1989. It was identified independently at roughly the same time in 1996 by the Kent County Council Heritage Conservation Group who commissioned the site to be excavated between 1997-8 in advance of construction of the Ramsgate Harbour Relief Road (Dyson *et al* 2000). The site at Court Stairs was uncovered by chance during redevelopment of a property on the outskirts of Ramsgate in 2007 (Moody 2008, 66-8).

On the Isle of Sheppey, two adjacent causewayed enclosures were discovered at Kingsborough Hill, the first in 1999 during development for housing and the second in 2004 (Whittle *et al* 2011). Two further 'probable' enclosure sites were found at Eastry near Dover and Burham, south-west of Chatham. Both these sites were retrospectively identified on existing CUCAP and RCHME aerial photographs.

In addition to the six (three confirmed and three possible) sites in Kent, a further potential causewayed enclosure at Margate was seen on CUCAP aerial photographs but was considered and rejected as unlikely by RCHME/English Heritage (Oswald *et al* 2001, 153). However, this site may now be reconsidered as a potential site on the basis of its morphological similarities to other recently confirmed sites across Kent.

Court Stairs and Chalk Hill causewayed enclosures

The enclosures at Court Stairs and Chalk Hill are located on the southern side of the Isle of Thanet, lying c. 600m apart (to the east of Cliffs End). In common with the potential site at Cliffs End both Court Stairs and Chalk Hill sit on the western sides of natural dry valleys a short distance from the coastline with views to Pegwell Bay and the English Channel beyond. Both causewayed enclosures have been dated and found to belong to the early period of causewayed enclosures construction.

The causewayed enclosure at Chalk Hill is located immediately to the west of Ramsgate and was simultaneously identified in 1997 through aerial survey (Oswald *et al* 2001, 55), and during excavations in advance of the Ramsgate Royal Harbour Relief Road (Clark *et al* 2019, 84-85).

The Chalk Hill site appeared from the aerial photographs to be a single arc of segmented ditches, but the excavations identified parts of three circuits of interrupted ditch which were made up of sequences of intercut and amalgamated pits enclosing an area at least 150m in diameter (Clark *et al* 2019, 49 and Last 2019, 6). Other features included complex multi-period remains of ditches, trackways and pits, virtually none of which are evident on the aerial photographs (Clark *et al* 2019). Analysis of radiocarbon dates obtained from animal bone in the causewayed enclosure ditch fills suggests that the ditches were probably first cut between 3,775 and 3,675 cal BC (at 95% probability), and with the main phase of use at the site ending after about 45 to 175 years (at 95% probability), somewhere

between 3630 and 3530 cal BC (at 95% probability: Clark *et al* 2019, 84-85). Therefore the site seems to have been used for around a century.

Statistical modelling of radiocarbon dates (Whittle *et al* 2011, 691, 897) suggests that Chalk Hill may well be the earliest dated causewayed enclosure in the British Isles, perhaps even the model for all those which followed as this new trend of monumental enclosure and its attendant practices from the continent spread west and north-west across the country.

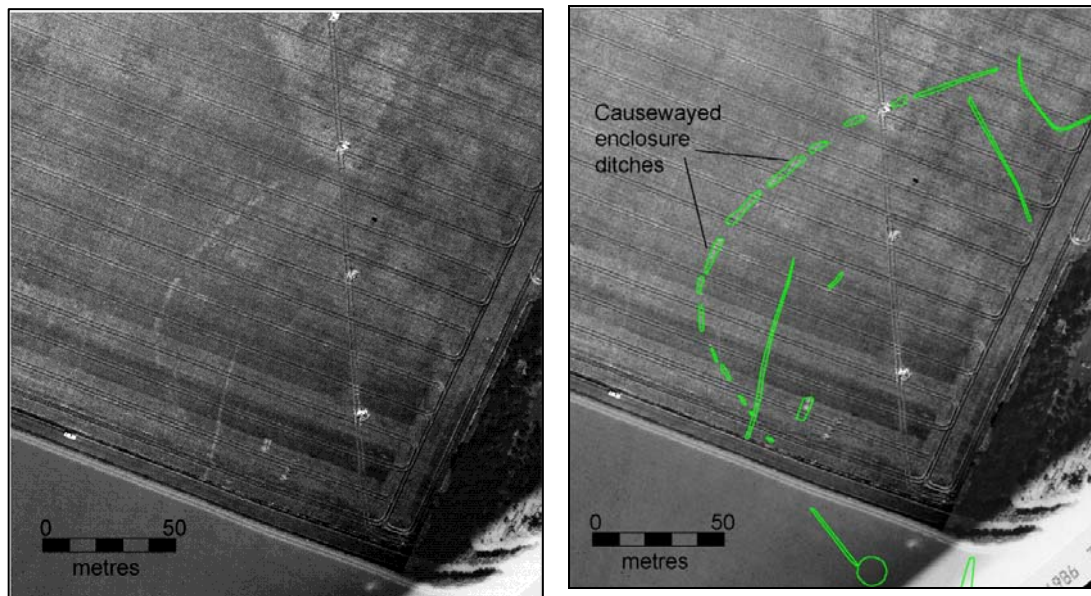


Figure 11 Extract of aerial photograph NMR TR366/6/1059 06-AUG-1986 showing the faint cropmarks (left) and the same photograph with the transcribed remains of the circuit of segmented ditch of Chalk Hill Neolithic causewayed enclosure (right). This illustrates the difficulty in identifying these sites and the often slight nature of the cropmark in comparison with the remains surviving beneath the surface. © Historic England; © Crown Copyright and database right 2020. All rights reserved. Ordnance Survey Licence number 100019088.

The site at Court Stairs is not visible on aerial photographs but was found due to construction work beneath the building and garden of Court Stairs Lodge on the outskirts of Ramsgate. Only two segments of ditch and a number of scooped hollows were excavated, but finds of significant cultural material including food waste (butchered bone including large disarticulated and split animal bones, and shellfish) provide dating evidence. This confirmed the site is likely to be part of a Neolithic causewayed enclosure with a projected diameter of approximately 100m (Moody 2008, 66-8; Last 2019, 6). The most significant find was a horned ox skull placed in the end of one of the ditches. A single date has been obtained for the enclosure at Court stairs (UBA-15141; 4778±22 BP), which gives a likely range of 3605-3520 cal BC (82% probability). This suggests it was in use later than Chalk Hill, which is supported by the presence of decorated pottery at Court Stairs whilst the pottery collected from Chalk Hill is plain in its finish (J Last pers com 2019).

Discussion

Neolithic causewayed enclosures are still relatively rare and each new discovery is considered a nationally important heritage asset. The location of two such enclosures in close proximity to one another is of great importance, but to find a third close-by potentially increases the significance of the grouping.

Radiocarbon dates for the two confirmed causewayed enclosures at Chalk Hill and Court Stairs have already proved both sites to be early examples and Chalk Hill is currently the earliest dated causewayed enclosure in Britain. Should the enclosure at Cliffs End proved to be of a similar early date, the presence of three such early sites within a 1.5km strip of coastline would be of considerable local and national importance.

Should the formerly rejected/discredited enclosure at Margate also be reconsidered, this could potentially raise the count of causewayed enclosures on Thanet to four adding weight to the suggestion that the Isle of Thanet was an important centre in the Neolithic, reflecting its proximity to the narrowest crossing of the English Channel, with the region of Kent acting as a gateway between Britain and the Continent.

Though still few in number, new causewayed enclosure sites continue to be found across Britain. Each new discovery adds to our understanding of their development, methods of construction and associated assemblages of this short-lived enigmatic group of monuments.

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