Meadow Environmental Consulting

Phase I Environmental Assessment –
Desk Study and Walkover Survey
(LCRM Stage 1 Tier 1 Risk Assessment)

Site: Boundary Close, Minster on Sea, Isle of Sheppey, Kent ME12 3RG

Prepared for: Taylor Brothers Limited

Date: 1st December 2023

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CLIENT: Taylor Brothers Limited

SITE: Boundary Close, Minster on Sea, Isle of Sheppey, Kent ME12 3RG

PROJECT REFERENCE: 23-141/P1

DATE: 1st December 2023

Report: Phase I Environmental Assessment – Desk Study and Walkover Survey (LCRM Stage 1, Tier 1 Risk Assessment)				
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CONTENTS & EXECUTIVE SUMMARY

Page No

APPENDICES

Executive Summary

Meadow Environmental Consulting was instructed by Refine Architecture on behalf of Taylor Brothers Limited to carry out a Preliminary Environmental Risk Assessment (desk study and walkover survey) of the site at:

Boundary Close, Minster on Sea, Isle of Sheppey, Kent ME12 3RG

A planning application has been submitted to and approved by Swale Borough Council (reference SW/05/1197). A desk study report is required to address part of condition 6(A) of the granted application and is also required to address various sections of the National Planning Policy Framework (Revised NPPF 2021). It is unclear whether condition 6(A) was addressed before the first houses were built and subsequently this condition has not been discharged.

The site is at the east end of Boundary Close and on the south side of Chequers Road. Planning was granted for seventeen two storey houses in 2007 all with private gardens and off road parking. Most of the plots have been built by various developers and it's now proposed to construct the last of the dwellings.

From the investigations carried out for this desk study the site was undeveloped and within an area of farmland and/or scrub from at least the mid 1860's until at least 2007. Between 2007 and 2013 Boundary Close had been extended onto the site and the existing houses in the south area that are now occupied were built by 2015. Two of the houses in the northwest area of the site that are also occupied were built between 2022 and 2023.

The immediate surrounding areas have been mostly farmland since at least the mid 1860's to at least the mid 1950's although a few houses had been built in the immediate area during this period that remain to date. By the early 1960's many more houses had been built in the further environs with those in Boundary Close and Echo Walk immediately to the west built by 1990. The existing recreation ground to the south and southwest has been in situ since at least the early 1960's with the recreation ground car park constructed immediately to the south of the site between 2007 and 2013. The school just to the southeast was built on former farmland in 1990's.

The predominant underlying bedrock geology is The London Clay Formation (clay and silt) of very low to low permeability with no drift deposits. The Claygate Member (clay, silt and sand) of very low to high permeability underlies the northeast and southeast areas of the site and thus the site is overlying a secondary aquifer (minor aquifer) but is not within a groundwater source protection zone (SPZ).

There are no surface water features on, adjacent or near to the site.

There are no current surface water abstractions in the area (within 2km) for potable water or for other uses.

There are no current groundwater abstractions in the area (within 2km) for potable water supplies or other uses although there is a shallow (2.5m deep) private well 40m to the north of the site at N^{o}26 Chequers Road. The water is used for garden irrigation.

The findings of this report indicates that it is unlikely that there are any sources of contamination on this site that could have impacted the site soils to unacceptable levels for the proposed residential end use, the site represents a **very low environmental risk** and that a phase II intrusive investigation (LCRM Stage 1, Tier 2/Tier 3 Risk Assessment) of the site is not required.

1. Introduction

Meadow Environmental Consulting was instructed by Refine Architecture on behalf of Taylor Brothers Limited to carry out a Preliminary Environmental Risk Assessment (desk study and walkover survey) of the site at; Boundary Close, Minster on Sea, Isle of Sheppey, Kent ME12 3RG (grid reference at the centre of the site is 596062 172806). The site is approximately 50 metres above ordnance datum (AOD) in the small town of Minster on Sea, Sheppey, Kent.

The desk study would mainly comprise of a walkover survey of the site, review historical land use, review historical maps, assess the environmental sensitivity of the site and surrounding areas, review geological maps, investigate pollution incident registers, abstraction and discharge consents and liaise with the relevant personnel at the local authority if necessary.

The main sources of the information are, but not limited to; The Environment Agency (EA), Ordnance Survey, The Coal Authority, British Geological Survey, Natural England, Public Health England and The Health and Safety Executive.

The site is at the east end of Boundary Close and on the south side of Chequers Road. Planning was granted for seventeen two storey houses in 2007 all with private gardens and off road parking (Swale Borough Council planning reference SW/05/1197). Most of the plots have been built by various developers and it's now proposed to construct the last of the dwellings. Condition 6 of the original approval was to address potential contamination. It is unclear whether this was addressed before the first houses were built and subsequently this condition has not been discharged.

Site plans showing the site location, existing layout and the proposed layout is shown in appendix 1, site plans (p1 and p2).

2. The Site and Surrounding Areas

2.1 Location and Setting

The site covers an area of approximately 0.59ha (5900m^2) and is at the east end of Boundary Close and on the south side of Chequers Road in the small town of Minster on Sea, near Sheerness. The centre of Minster is approximately one mile to the west and the centre of Sheerness is approximately three and a half miles to the northwest.

It is located in an area of predominantly medium to low density residential use although there is a school, a recreation ground and farmland in the area.

Aerial photographs of the site ranging from 1999 to 2021 are shown in the Groundsure Enviro and Geo Insight Report in appendix 5 (p9 to p13).

Immediately to the north of the site is Chequers Road with residential houses beyond Chequers Road to the northeast that extend to approximately 320m from the site with a holiday park beyond. An area of scrub is immediately beyond Chequers Road to the north/northwest with residential houses further to the northwest that extend to more than 500m from the site.

Immediately to the west of the site are houses in Boundary Close and Echo Walk with houses in Tams Gardens and Chapel Street beyond. Residential houses extend to more than 500m to the west. Approximately 20m to the west/northwest is the junction of Boundary Close, Chequers Road and Chapel Street. A recreation ground (Gilbert Hall Ground) is immediately to the west/southwest with a cricket pitch (Minster Cricket Club) and football pitches.

Immediately to the south of the site is the car park for the recreation ground with the grassed areas of the recreation ground beyond that extend to approximately 200m to the south/southwest with farmland beyond. Approximately 410m from the site beyond the farmland are residential houses.

Immediately to the east of the site is an access road to the recreation ground, St Georges Church of England Primary School and Gilbert Hall Farm. Beyond the access road to the east are residential houses that extend to more than 500m from the site. The primary school is on the opposite side of the access road to the southeast the grounds of which extend to approximately 200m from the site with farmland beyond. Elm Lane is approximately 390m to the southeast with farmland beyond.

2.1.1 Walkover Survey

The walkover survey was carried out on the 28th November 2023. At the time of the walkover survey the site was mostly in full use for residential uses. Plots 1, 2 and 9 to 16 had been built and were fully occupied (also see section 3.3). Plot 3 had been built although not completed. The built houses and private garages were all of brick construction with duel pitched tiled roofs.

The access road to the site, Boundary Close was tarmac hard cover in the west area. The road in the east area and all parking areas was block paviors.

The area at the location of plot 4 and plots 5 to 8 were exposed soil of soft brown silty clay (London Clay, see section 4.6). The groundworks had commenced in the area of plots 5 to 8 and some of the piled foundations had been installed.

The front and rear gardens, where visible, were well kept lawns with a few plants and small hedges.

The north and east boundaries to plots 5 to 8 were Heras fencing. Parts of the north boundary had a timber post and wire mesh fence with the area between this fence and the Heras fencing and the north boundary with Chequers Road was occupied with an established hedge. The northwest and south boundaries had a closed board fence.

All the vegetation on and adjacent to the site appeared to be in a very healthy condition.

There were no above ground fuel tanks on or adjacent to the site and there was no evidence of any former above ground fuel tanks on or adjacent to the site. There were no below ground fuel tanks on or adjacent to the site.

A site plan showing the existing and proposed layout and the immediate surrounding areas is shown in appendix 1 (p3). Also shown on this site plan are the locations and view direction of the photographs of the site that were taken during the walkover survey. The site photographs are shown in appendix 3.

There are no current or former fuel stations within 250m.

There are no high voltage underground electricity transmission cables or high pressure gas pipelines within 500m of the site.

This is all shown in appendix 5 (section 4).

2.2 Hydrology
There are no surface water features on, adjacent or near to the site (within 250m).

This is shown in appendix 5 (section 6).

3. Historical Site Use

3.1 1865 to 1908
The study of the historical maps of the site, some of which can be found in appendix 4, Historical Maps, shows that the site was undeveloped in 1865 and was within an area of farmland.

Most of the roads in the area were not constructed although Chequers Road (Mill Road at this date) and Chapel Street were both constructed and followed the same route that remains to date. Further to the southeast Elm Lane was also constructed. Most of the houses in the area were not constructed although the centre of Minster was developed further to the west and was smaller in layout. A house (Bath Cottage) was on the opposite side of Mill Road at the location of the existing N°26 Chequers Road. Further to the south was Borstal Hall that is now Gilbert Hall Farm. The track leading to Borstal Hall was just to the west of the site at the approximate location of the existing Boundary Close. Further to the east in Mill Road approximately 230m from the site was a windmill (corn). Further to the west/northwest in Chapel Street approximately 120m from the site was Tams Farm.

By 1896 the site and immediate surrounding areas generally remained unchanged. A small mound was marked on the opposite side of Chequers Road just to the northwest at the location of the existing N°22 Chequers Road. Further to the east approximately 100m at the nearest point, Mill Road was marked as being within a cutting, which remains to date and the windmill was no longer marked.

By 1906 a terrace of houses had been built on the opposite side of Chequers Road to the north, which remain to date.

The site and surrounding areas remained unchanged until at least 1908.

3.2 1931 to 1955
By 1931 the site remained unchanged. More roads and houses had been built in the further environs. The small mound was no longer marked and a house was marked at this location. The track to Borstal Hall was no longer to the west of the site but immediately to the east, which is the existing access road.

The site and immediate surrounding area remained unchanged until at least 1955 although by 1938 Tams Close was under construction further to the west and many more houses had been built in the further environs.

3.3 1963 to Date
By 1963 the site remained unchanged although a row of trees was marked along the north boundary. More houses had been built in the immediate area including those to the east and northeast in Chequers Road. Bath Cottage to the north had also been redeveloped with the house that remains to date. The area to the south and southwest of the site was marked as a sports ground, which remains to date. Many more houses had been built in the further environs.

The site and surrounding areas remained unchanged until at least 1981.

By 1993 Boundary Close and its associated houses as well as Echo Walk had been built immediately to the east, which remain to date.

By 2001 the primary school had been built just to the southeast.

According to the OS mapping the site and immediate surrounding areas remained unchanged until at least 2010 and the extension to Boundary Close and the houses in the south area of the site were first marked on the 2023 OS map.

An assessment of historic aerial photographs shows that the site was undeveloped in 1940 and was open farmland (pasture). Most of the houses in the immediate area were not built although those on the opposite side of Chequers Road to the north were built. The access road was also immediately to the east of the site that remains to date. A small building was immediately to the west of the site. By 1960 the small building to the west was no longer shown and the site and most of the immediate surrounding area remained unchanged although the cricket field was to the southwest. By 1990 Boundary Close had been constructed as far as the west boundary of the site. The site remained unchanged. Most of the houses in the immediate area and further environs had been built by this date including those immediately to the west in Boundary Close and Echo Walk. The school just to the southeast was built in the 1990's. The site remained undeveloped until at least 2007 although appears to be an area of scrub from 2003 until 2007. By 2013 Boundary Close had been extended onto the site to the main layout that remains to date and the car park for the recreation ground had been constructed immediately to the south. By 2015 the houses had been built in the south area of the site. The north area of the site remained undeveloped and was scrub until at least March 2022.

Copies of the historical aerial photographs are shown in appendix 2 and 5.

3.4 Planning & Uses

Following an assessment of Swale Borough Council planning website there has been several planning applications all in conjunction with reserved matters for the original granted planning application as well as that tabulated below. Council online records for the area date from at least 1986.

Date	Planning Details
2005	Completion of adoptable access road and construction of 18 detached 2 storey dwellings with associated garaging and parking – withdrawn

The current land use data indicates that there are a no current or recent 'industrial sites' within 250m of the site.

There are no small electrical sub stations within 100m of the site.

This is all shown in appendix 5 (section 4).

4. Environmental Sensitivity

4.1 Site Sensitivity

The site is not within a site of special scientific interest (SSSI), special protection area (SPA), a special area of conservation (SAC), RAMSAR (wetlands) site, a nature reserve, ancient woodland, an area of greenbelt land, a biosphere reserve, forest park, a marine conservation zone (MCZ) or a nitrate vulnerable zone.

The site is within a SSSI Impact Risk Zone and this should be borne in mind with any potential planning applications and the local authority may need to be consulted although this unlikely for the type of development proposed.

This is all shown in appendix 5 (section 10).

The site is not within a conservation area, national park, an area of outstanding natural beauty, a registered park/garden or a world heritage site. There are also no scheduled monuments or listed buildings within 100m.

This is all shown in appendix 5 (section 11).

The agricultural land classification for the area and small areas of the site is recorded as grade 3 land. Grade 3 land is good to moderate quality agricultural land. "Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2." (reference Natural England).

This is all shown in appendix 5 (section 12).

The site is not within a designated habitat area.

This is all shown in appendix 5 (section 13).

4.2 Flooding

The highest risk of flooding from rivers and sea (RoFRaS) shows that the risk is '**Very Low**'.

"The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance)." (reference EA).

There are no flood defences within 250m.

There are no recorded flooding events on or within 250m of the site since records began in 1946.

This is all shown in appendix 5 (section 7).

The highest risk of surface water flooding on the site is negligible and in the immediate area (within 50m) is 1 in 30year, to a depth of 0.1m to 0.3m. (reference Ambiental Risk Analytics).

Ambiental Risk Analytics surface water (pluvial) flood map identifies areas likely to flood as a result of extreme rainfall events, typically this is topographical low spots which are naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

This is all shown in appendix 5 (section 8).

The potential for groundwater flooding is classed as negligible on the site and in the immediate area (within 50m).

This is shown in appendix 5 (section 9).

4.3 Potentially Contaminative Use

The site is not within an area of potentially contaminative use from past industrial use but there are past 'industrial' uses within 250m.

The small mound that was to the northwest, the windmill and road cuttings further to the east are all marked but highly unlikely to impact the site.

There are no major historical energy features with 250m.

This is all shown in appendix 5 (sections 1 and 2).

The railway infrastructure information in appendix 5, section 22 shows that there are no existing railways, former railways, tunnels or proposed railways on the site or within 250m.

There are no areas of reclaimed ground, made ground, infilled ground, disturbed ground, worked ground and/or landscaped ground within 500m of the site (see appendix 5, section 15).

4.4 Landfill and Waste Transfer Sites

There are no current EA registered licensed landfill sites or local authority registered licensed landfill sites within 250m.

There are no EA registered historical licensed landfill sites in the area.

There is one waste exemption licence site within 250m. This is located 180m northwest of the site for the use of waste in construction at South Lees Farm. This activity is unlikely to impact the site from this location.

There are no other current or former licensed waste sites within 250m.

This is all shown in appendix 5 (section 3).

4.5 Hydrogeology

As there are no superficial deposits on the site there is no classification by the EA regarding the aquifer status within the superficial geology.

The site is classified by the EA as mostly overlying unproductive strata although small areas in the southeast and northeast area of the site and the wider area immediately to the east is a secondary 'A' aquifer within the bedrock geology.

These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers. (reference EA).

The site therefore could be classed as overlying a secondary (minor) aquifer.

The groundwater vulnerability is classed as high in the areas of the secondary aquifer. High indicates that "areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits." (reference British Geological Survey (BGS)/EA).

"Infiltration value (surface); >70%, Dilution value <300mm/year. Aquifer type (superficial); n/a, Vulnerability; unproductive, Thickness; <3m, Recharge potential; no data, Aquifer type (bedrock); secondary, Vulnerability; high, flow mechanism – mixed". (reference BGS/EA).

The site is not within a groundwater source protection zone (SPZ). (reference EA).

This is all shown in appendix 5 (section 5).

4.6 Geology

According to geological information, BGS sheet 272, Chatham, the site is underlain by Bagshot Beds (sand with pebble)/Claygate Beds (sands and clays)/London Clay with no drift deposits.

This is also shown on the superficial deposits and landslips information in appendix 5, section 15, which shows that there are no superficial deposits on the site but there are in the area (within 500m).

The areas marked are:
Area 1 (160m E) is head deposits (gravel, sand, silt and clay)
Area 2 (290m N) is head deposits (clay and silt)
Area 3 (350m NW) is head deposits (gravel, sand, silt and clay)
Area 4 (500m NE) is head deposits (clay and silt)

There are no areas of landslip deposits within 500m.

The bedrock and faults map in appendix 5, section 15 shows that The London Clay Formation (clay and silt) is the bedrock geology on most of the site of very low to low permeability (area 2 on the map). Also on the site in the northeast and southeast areas is The Claygate Member (clay, silt and sand), area 1 on the map, of very low to high permeability.

The other areas marked are:
Area 3 (50m NE) is The Bagshot Formation (sand)
Area 4 (90m W) is The Claygate Member (clay, silt and sand)
Area 5 (170m W) is The Bagshot Formation (sand)
Area 6 (410m N) is The Claygate Member (clay, silt and sand)
Area 7 (460m N) is The Bagshot Formation (sand)

There are no fault lines marked within 500m.

There is one previously drilled borehole within 250m of the site (see appendix 5, section 16).

This was ‘drilled’ 40m north of the site to a depth of 2.5m. The drilling date and detailed strata encountered are not recorded. It is an old private well approximately 800mm diameter and is on the site of N°26 Chequers Road (formerly Bath Cottage). The drilling date is unknown. The stratum recorded was The Claygate Member and the water level recorded in May 2021 was at 0.8m, hence a water depth of 1.7m, assuming a borehole/well depth of 2.5m. The water was being used for garden irrigation.

5. Discharge Consents, Water Abstractions and Pollution Incidents

5.1 Discharge Consents
There are no current or former licensed discharge consent points within 250m of the site.

This is all shown in appendix 5 (section 4).

5.2 Abstraction Consents
There are two current or former groundwater abstraction consents for potable water supplies or other uses within 2000m of the site.

Both are former consents that were located 360m and 700m northwest of the site

There are no current or former surface water abstraction consents for potable water supplies and/or other uses within 2000m of the site.

This is all shown in appendix 5 (section 5, p37, the map shows abstractions up to 500m only)

5.3 Pollution Incidents, Inventories and Permits
There are no recorded pollution incidents within 250m of the site.

There are no pollution inventories within 250m.

There are no Control of Major Accident Hazards (COMAH) sites within 250m.

There are no radioactive substance authorisations or regulated explosive sites within 250m.

There are no historical licensed industrial activities (IPC) within 250m.

There are no licensed industrial activities (Part A(1)) within 250m.

There are no licensed pollutant release (Part A(2)/B) within 250m.

There are no List 1 or List 2 dangerous substances records within 250m.

There are no sites determined as ‘contaminated land’ under Part 2A of the Environmental Protection Act 1990 within 500m of the site.

This is all shown in appendix 5 (section 4).

6. Subsidence, Mining Hazards and Radon

6.1 Subsidence

The clay swelling/shrinking subsidence hazard is classed as 'moderate hazard' (soils that are predominantly high plasticity) although this would depend on the localised clay content.

The running sand stability hazard is predominantly classed as 'negligible hazard' on most of the site and as 'very low hazard' in the southeast and northeast areas.

The compressible subsidence hazard is classed as 'negligible hazard'.

The collapsible ground stability hazard is predominantly classed as 'very low hazard'.

The landslides ground stability hazard is classed as ''very low hazard'.

The ground dissolution subsidence hazard is classed as 'negligible hazard'.

This is all shown in appendix 5 (section 17).

6.2 Mining Hazards

There are no surface ground workings on the site although there are in the area (within 250m). The former small mound just to the northwest and the road cuttings further to the east are marked but are highly unlikely to affect the site.

There are no BritPits (British Pits, active and closed surface and underground mineral workings) within 250m.

There are no underground workings on the site or within 250m.

The site is not within an area that may be affected by past, current or future coal mining.

There are no natural cavities within 250m of the site.

There are no non coal mining cavities within 250m.

This is all shown in appendix 5 (sections 18 and 19).

6.3 Radon

There are less than 1% of properties* in the area that are above the action level for radon and therefore radon protection measures are not necessary in new buildings and/or extensions.

* Estimated percentage of dwellings exceeding the Radon Action Level. The highest radon reading within the buffer is provided. This data is the highest resolution radon dataset available for the UK, produced to a 50m accuracy. This data has been pre-buffered to account for the relative accuracy and other uncertainties, so no additional buffering on site is required. The findings of this section should supersede any estimations derived from the Indicative 1km Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households (reference BGS and Public Health England).

This is shown in appendix 5 (section 20).

7. Recommendations

7.1 General

From the investigations carried out for this desk study the site was undeveloped and within an area of farmland and/or scrub from at least the mid 1860's until at least 2007. Between 2007 and 2013 Boundary Close had been extended onto the site and the existing houses in the south area that are now occupied were built by 2015. Two of the houses in the northwest area of the site that are also occupied were built between 2022 and 2023.

The immediate surrounding areas have been mostly farmland since at least the mid 1860's to at least the mid 1950's although a few houses had been built in the immediate area during this period that remain to date. By the early 1960's many more houses had been built in the further environs with those in Boundary Close and Echo Walk immediately to the west built by 1990. The existing recreation ground to the south and southwest has been in situ since at least the early 1960's with the recreation ground car park constructed immediately to the south of the site between 2007 and 2013. The school just to the southeast was built on former farmland in 1990's.

There are no surface water features on, adjacent or near to the site.

The site overlies a secondary aquifer (minor aquifer) but is not within a groundwater source protection zone (SPZ).

The London Clay Formation (clay and silt) is the predominant bedrock geology on the site of very low to low permeability with no drift deposits. The Claygate Member (clay, silt and sand) of very low to high permeability underlies the northeast and southeast areas of the site.

There are no current groundwater abstractions in the area (within 2km) for potable water supplies or other uses although there is a shallow (2.5m deep) private well 40m to the north of the site at N^{o}26 Chequers Road. The water is used for garden irrigation.

There are no current surface water abstractions in the area (within 2km) for potable water or for other uses.

It is proposed that the surface water drainage for the new buildings will be discharged via the existing local mains system as it is at present.

It is proposed that the foul drainage for the new dwellings will also be discharged via the existing local mains system as it is at present.

The site is not within a flood risk area.

7.2 On-Site Contamination Impact

From the investigations carried out for this desk study it is unlikely that the site has been impacted to unacceptable levels for residential end uses from its former and current uses.

There are no recorded pollution incidents on the site that could have impacted the site.

It is unlikely that landfill gases are impacting the site from on site sources.

7.3 Off-Site Contamination Impact

The findings of this desk study indicate that contamination impact to the site from the immediate surrounding areas is unlikely.

There are no recorded pollution incidents near the site that could have impacted the site.

It is unlikely that landfill gases are impacting the site from off site sources.

7.4 Conceptual Model

Using the Contaminated Land Exposure Assessment (CLEA) model and associated Environment Agency Land Contamination Risk Management guidance (LCRM) framework to assess sites, a Source – Pathway – Receptor approach is used.

Source – "a contaminant or pollutant that is in, on or under the land and that has the potential to cause harm or pollution"
Pathway – "route by which a receptor is or could be affected by a contaminant"
Receptor – "something that could be adversely affected by a contaminant, for example a person, controlled waters, an organism, an ecosystem, or Part 2A receptors such as buildings, crops or animals"

If any of the above elements are missing i.e. there is no pollution linkage, then it is considered that there is no significant risk associated with contamination. If there is a pollution linkage the potential risks to the identified receptors need to be assessed.

7.4.1 Source(s)

The possible sources of contamination on this site are:
There are unlikely to be any sources of contamination on this site at unacceptable levels

7.4.2 Pathway(s)

It is proposed to develop the site with residential houses with off road parking and private gardens. Most of the houses have been built and are occupied.

Using the CLEA model the potential pathways for a residential site are:
Ingestion of soils/groundwater/surface water
Ingestion of dusts, gases and vapours (indoors and outdoors)
Dermal contact with soils/groundwater/surface water
Ingestion of contaminated vegetables and or soils attached to vegetables (if applicable)
Leachate via soakaways (if applicable)
Leachate via infiltration

The potential pathways for this site are:
Ingestion of soils
Ingestion of dusts (indoors and outdoors)
Dermal contact with soils
Ingestion of contaminated vegetables and or soils attached to vegetables (if applicable)
Leachate via infiltration

7.4.3 Receptor(s)

The potential receptors and associated risks for this site are:
Construction staff – very low risk
Residents on site – very low risk (no existing impact to the current residents)
New/existing buildings and below ground services – very low risk
Adjacent and nearby dwellings and buildings – very low risk (no apparent current impact)
Groundwater (secondary aquifer not SPZ) – very low risk via infiltration (no expected leachable contaminants at unacceptable levels)

7.4.4 Assessment of Risk

The assessment of the associated risk is based on the CIRIA (Construction Industry Research and Information Association) C552 methodology, contaminated land risk assessment, a guide to good practice (2001), tabulated below and overleaf.
(SH = Significant Harm, SPOSH = Significant Possibility of Significant Harm).

Classification of Consequence

Classification	Definition
Severe	Concentration of contaminants is likely to (or is known from previous data to) exceed that indicative of unacceptable intake or contact. **Highly elevated** concentrations **likely** to result in 'significant harm' to human health as defined by the EPA 1990 Part 2A, if exposure occurs i.e. SH/SPOSH concentrations are high enough to cause acute (short term) effects. Equivalent to an EA category 1 pollution incident including **persistent and/or extensive** effects on water quality (controlled waters); leading to a closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce. **Major damage** to aquatic or other ecosystems, which is **likely** to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long term maintenance of the population. **Catastrophic** damage to buildings or property.
Medium	Concentration of contaminants is likely to (or is known from previous data to) exceed that indicative of unacceptable intake or contact. **Elevated** concentrations which could result in 'significant harm' to human health as defined by the EPA 1990 Part 2A, if exposure occurs i.e. greater than SH/SPOSH Equivalent to an EA category 2 pollution incident including **a significant** effect on water quality (controlled waters); notification required to abstractors; reduction on amenity value or significant damage to agriculture or commerce. **Significant damage** to aquatic or other ecosystems, which **may** result in a substantial adverse change in its functioning or harm to a species of special interest that **may** endanger the long term maintenance of the population. **Significant** damage to buildings or property.

Classification of Consequence (cont)

Classification	Definition
Mild	Concentration of contaminants is likely to (or is known from previous data to) exceed that indicative of no harm but not unacceptable intake or contact. Exposure to human health **unlikely** to lead to 'significant harm' i.e. concentrations are greater than SGV/GAC but less than SH/SPOSH. Equivalent to an EA category 3 pollution incident including **minimal or short term** effects on water quality (controlled waters); minor impact on amenity value, agriculture or commerce. **Minor damage or short term damage** to aquatic or other ecosystems, which is **unlikely** to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long term maintenance of the population. **Minor** damage to buildings or property.
Minor	Concentration of contaminants is likely to (or is known from previous data to) be less than that indicative of no harm. No measurable effect on humans i.e. less than SGV/GAC. Equivalent to an unsubstantial pollution incident with **no observed** effect on water quality (controlled waters); no reduction on amenity value or damage to agriculture or commerce. **No observed effect** to aquatic or other ecosystems. **Repairable effects of damage** to buildings or property.

Classification of Probability

Classification	Definition
High Likelihood	There is a pollution linkage and an event that appears **very likely** in the short term and **almost inevitable** in the long term, or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is **probable** that an event will occur. Circumstances are such that an event is **not inevitable** but possible in the short term and likely over the long term.
Low Likelihood	There is a pollution linkage and circumstances are possible under which an event **could occur**. However, it is **no means certain** that even over a longer period such event could take place, and it is less likely in the shorter term.
Unlikely	There is a pollution linkage but the circumstances are such that it is **improbable** that an event would occur even in the very long term.

Matrix of Consequence against Probability to determine Risk Classification

	Consequence			
Probability	Severe	Medium	Mild	Minor
High Likelihood	Very High Risk	High Risk	Moderate Risk	Low Risk
Likely	High Risk	Moderate Risk	Low Risk	Very Low Risk
Low Likelihood	Moderate Risk	Low Risk	Low Risk	Very Low Risk
Unlikely	Low Risk	Very Low Risk	Very Low Risk	Very Low Risk

A schematic diagram of the conceptual model for the site dated 29/11/23 is shown in appendix 6, conceptual model.

7.5 Investigation Work Recommended

7.5.1 General

As outlined above it is unlikely that there are any sources of contamination on this site that could have impacted the site soils to unacceptable levels for the proposed residential end use from the on site past or current uses.

It is unlikely that the site has been impacted to unacceptable levels by the uses and/or activities from the immediate surrounding areas.

The risk to human health could be classed as very low (worse case consequence – minor: worse case probability – unlikely).

The risk to the new buildings and below ground services could be classed as very low (worse case consequence – minor: worse case probability – unlikely).

The site overlies a secondary aquifer (minor aquifer) but is not within a source protection zone (SPZ). There are no groundwater abstractions or surface water abstractions within 2km of the site although there is a shallow (2.5m deep) private well 40m to the north of the site at N°26 Chequers Road where the water is used for garden irrigation. It is proposed that the surface water drainage for the new buildings will be discharged via the existing local mains system.

It is proposed that the foul drainage for the new dwellings will be discharged via the existing local mains system.

There are no expected sources of leachable contamination at unacceptable levels on the site.

The risk to controlled waters now and on completion of the development could be classed as very low (worse case consequence – minor: worse case probability – unlikely).

It is therefore not necessary to carry out a phase II intrusive investigation of the site (EA LCRM stage 1 tier 2/3 contaminated land investigation). LCRM (Land Contamination Risk Management, published October 2020 and last updated April 2021).

7.6 Excavated Soils

Any excavated soils that are produced as part of the construction work that are to be removed from the site to landfill, chemical analysis will be required to classify the 'waste' in conjunction with the EU Landfill Directive that came into effect in 2005, which defines the criteria for the chemical analysis and classification of materials that are to be disposed to landfill.

Should soils need to be removed from the site to landfill, a European Landfill Directive Waste Acceptance Criteria analysis will be required on the material to be disposed to be submitted to the proposed receiving tip before the soil is removed from the site.

The different strata excavated (if applicable) should be segregated and analysed separately prior to disposal off site.

7.7 Additional Notes

Should any contaminants be encountered during the development works that were not expected analysis must be carried out to identify the type and extent of the contamination.

During the construction work, exposed soils should be protected from any accidental leakage or spillages from stored oils/fuels or chemicals used in the construction work, if any, to prevent any potential impact to the site or controlled waters.

The ground stability hazards in section 6.1 and associated comments where applicable are the opinion of the BGS based on the expected geology.

A copy of this report should be forwarded to Swale Borough Council or other regulators/insurers if applicable for their consideration and approval.

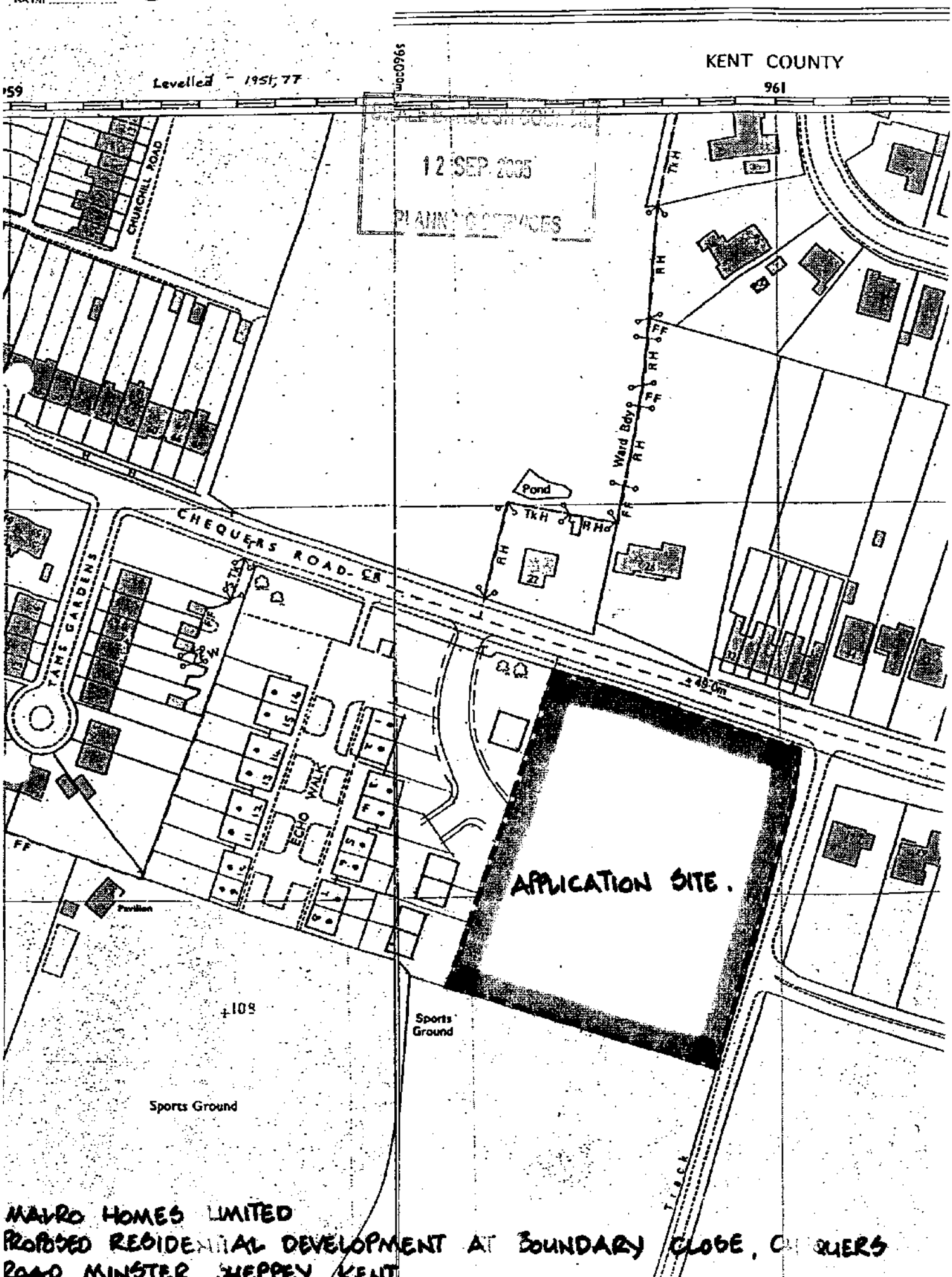
K.D.Huxley CSci CChem MRSC MIEnvSc RSoBRA
Date: 01/12/23

APPENDIX 1

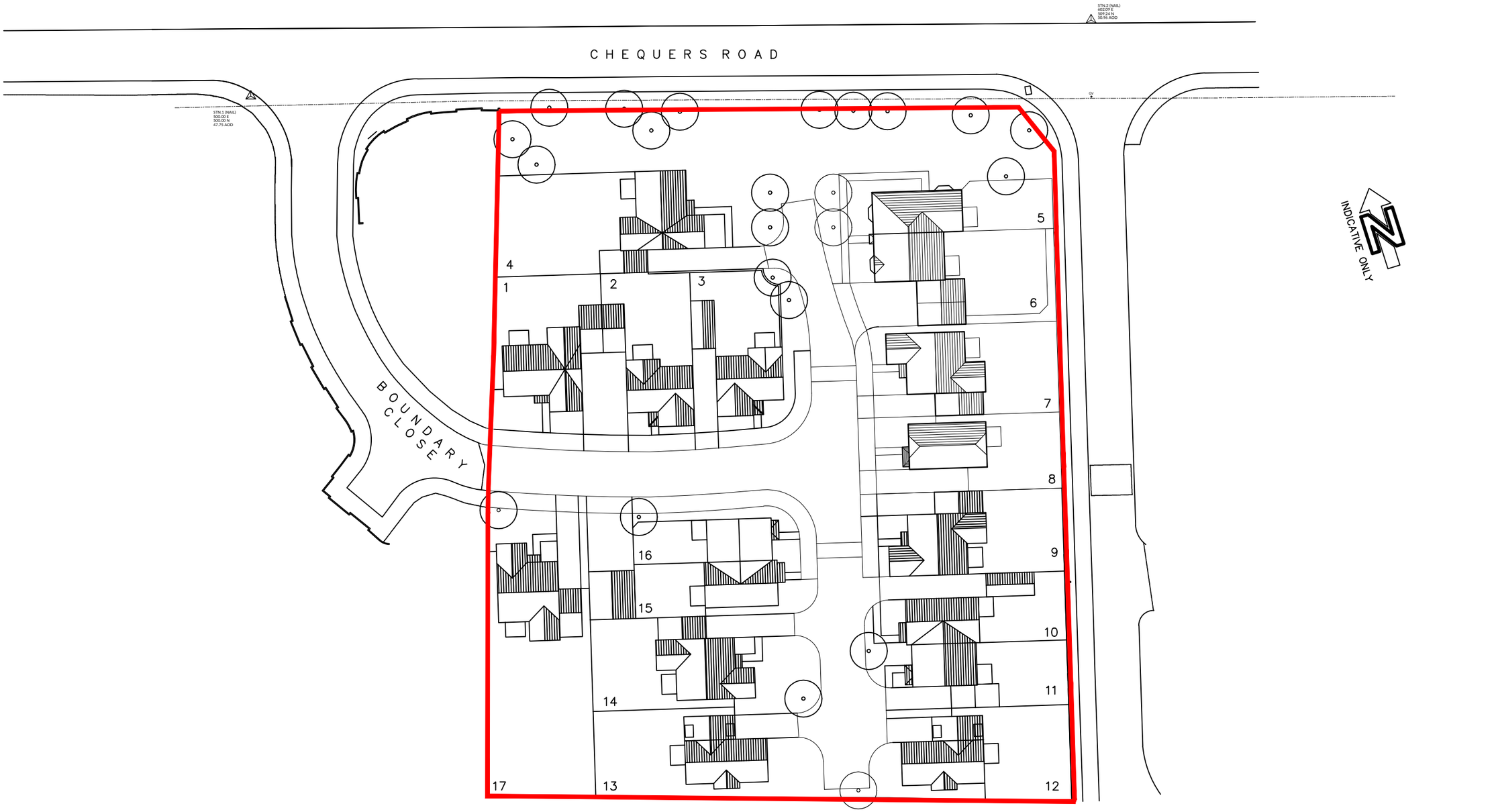
SITE PLANS

SW/05/1193 43 SH

PLAN TQ NAL GRID PLANS Scale 1:1250



MAYRO HOMES LIMITED
PROPOSED RESIDENTIAL DEVELOPMENT AT BOUNDARY CLOSE, CHEQUERS ROAD MINSTER SHEPPEY KENT



PLANNING

23-13-PL11

Drawn By	Checked By	Date	Scale	Size	Revision
DDL	RE	October 2023	1:500	A3	

Residential Development at

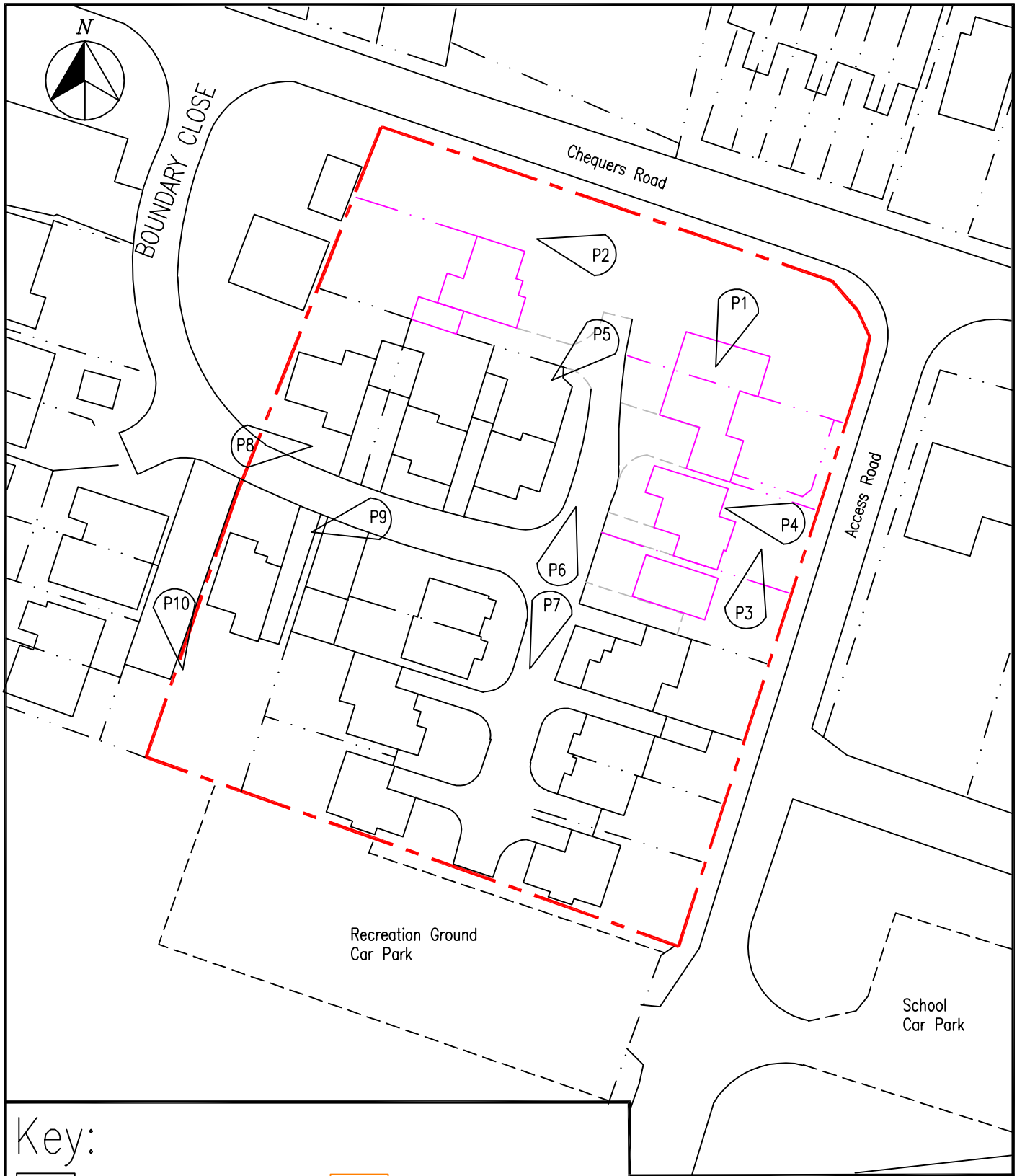
Boundary Close, Sheppey, Kent.

TFP Investments Ltd.

Proposed Block Plan

REFINE ARCHITECTURE

Address : Unit 6, Grove Diary Farm,
Bobbing Hill, Sittingbourne, Kent, ME9 8NY
Telephone : 01795 844162
E-mail : mail@refinearchitecture.co.uk



Key:

- Existing Dwellings and Garages
- Former Buildings
- New Dwellings and Garages
- Proposed Access and Parking

Scale: NTS

Drawn: KDH

Site: Boundary Close, Minster on Sea ME12 3RG

Report: 23-141/P1

Title: Phase 1 Contamination Investigation (Desk Study)

Figure No: 1

APPENDIX 2

HISTORIC AERIAL PHOTOGRAPHS

All aerial photographs below courtesy of Google Earth

AERIAL PHOTOGRAPH 1 (1940)

AERIAL PHOTOGRAPH 2 (1960)

AERIAL PHOTOGRAPH 3 (1990)

AERIAL PHOTOGRAPH 4 (2003)

AERIAL PHOTOGRAPH 5 (2007)

AERIAL PHOTOGRAPH 6 (2013)

AERIAL PHOTOGRAPH 7 (2015)

AERIAL PHOTOGRAPH 8 (2019)

AERIAL PHOTOGRAPH 9 (2022)

APPENDIX 3

SITE PHOTOGRAPHS

PHOTOGRAPH 1

Looking south across the northeast area of the site that is proposed for plots 5 to 8. The central area will be occupied by the new dwellings.

PHOTOGRAPH 2

Looking west/northwest across the northwest area of the site at the area that is proposed for plot 4.

PHOTOGRAPH 3

Looking north across the northeast area of the site at the east boundary that is proposed for plots 5 to 8. This area will mainly be the private gardens.

PHOTOGRAPH 4

Looking west/northwest across the central area of the northeast area of the site that is proposed for plots 5 to 8. The unfinished plot 3 is in the background.

PHOTOGRAPH 5

Looking southwest from the northeast area of the site at the incomplete plot 3. The adjacent occupied plot 2 is in the background.

PHOTOGRAPH 6

Looking north/northeast from the centre of the site at the location of the proposed access road to plot 4. The parking areas to plots 5 to 8 will be on the right and the unfinished plot 3 is on the left.

PHOTOGRAPH 7

Looking south/southwest from the centre of the site showing the occupied plots in the south area of the site that were built between 2013 and 2015.

PHOTOGRAPH 8

Looking east from the west boundary showing the occupied plots 1 and 2 with the unfinished plot 3 in the background.

PHOTOGRAPH 9

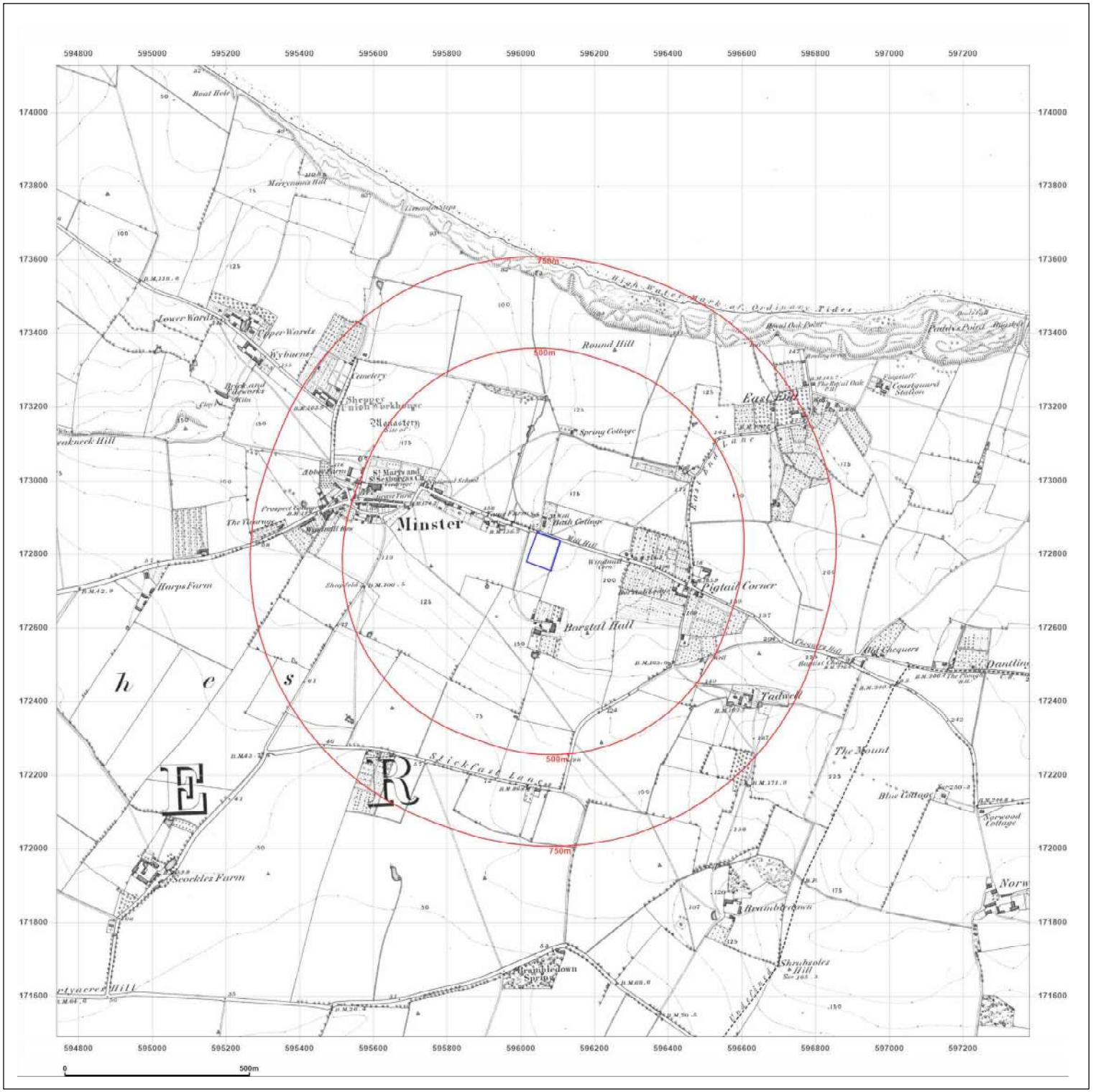
Looking west/southwest across part of the southwest area of the site showing the occupied plot 17 that was built between 2013 and 2015. The adjacent dwellings in Boundary Close and Echo Walk that were built in the 1980's are in the background.

PHOTOGRAPH 10

Looking southwest across the rear garden to plot 17. The adjacent recreation ground (Minster Cricket Club) is in the background beyond the gate.

APPENDIX 4

HISTORICAL MAPS



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

Boundary Close, Minster-On-Sea,
Sheppey, ME12 3RG

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Report Ref: CMAPS-CM-1136987-61952-221123HIS
Grid Ref: 596060, 172807

Map Name: County Series
Map date: 1865
Scale: 1:10,560
Printed at: 1:10,560

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Surveyed 1865
Revised 1865
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 22 November 2023

Map legend available at:
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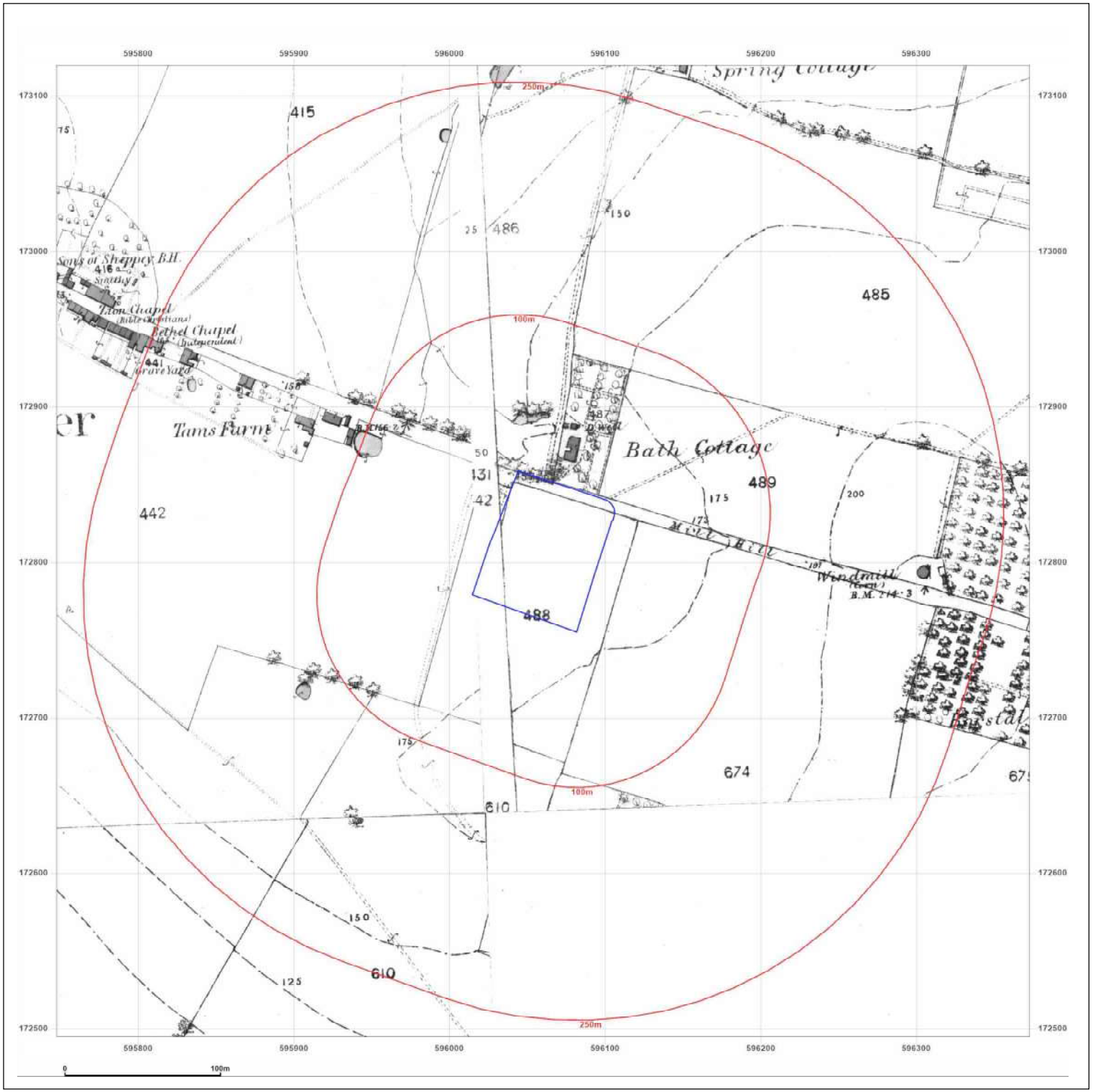

CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

Boundary Close, Minster-On-Sea,
Sheppey, ME12 3RG

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Report Ref: CMAPS-CM-1136987-61952-221123HIS
Grid Ref: 596060, 172807

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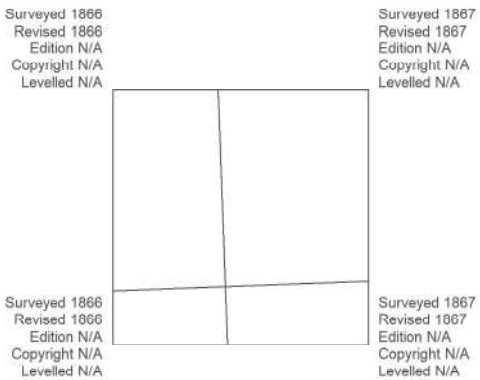

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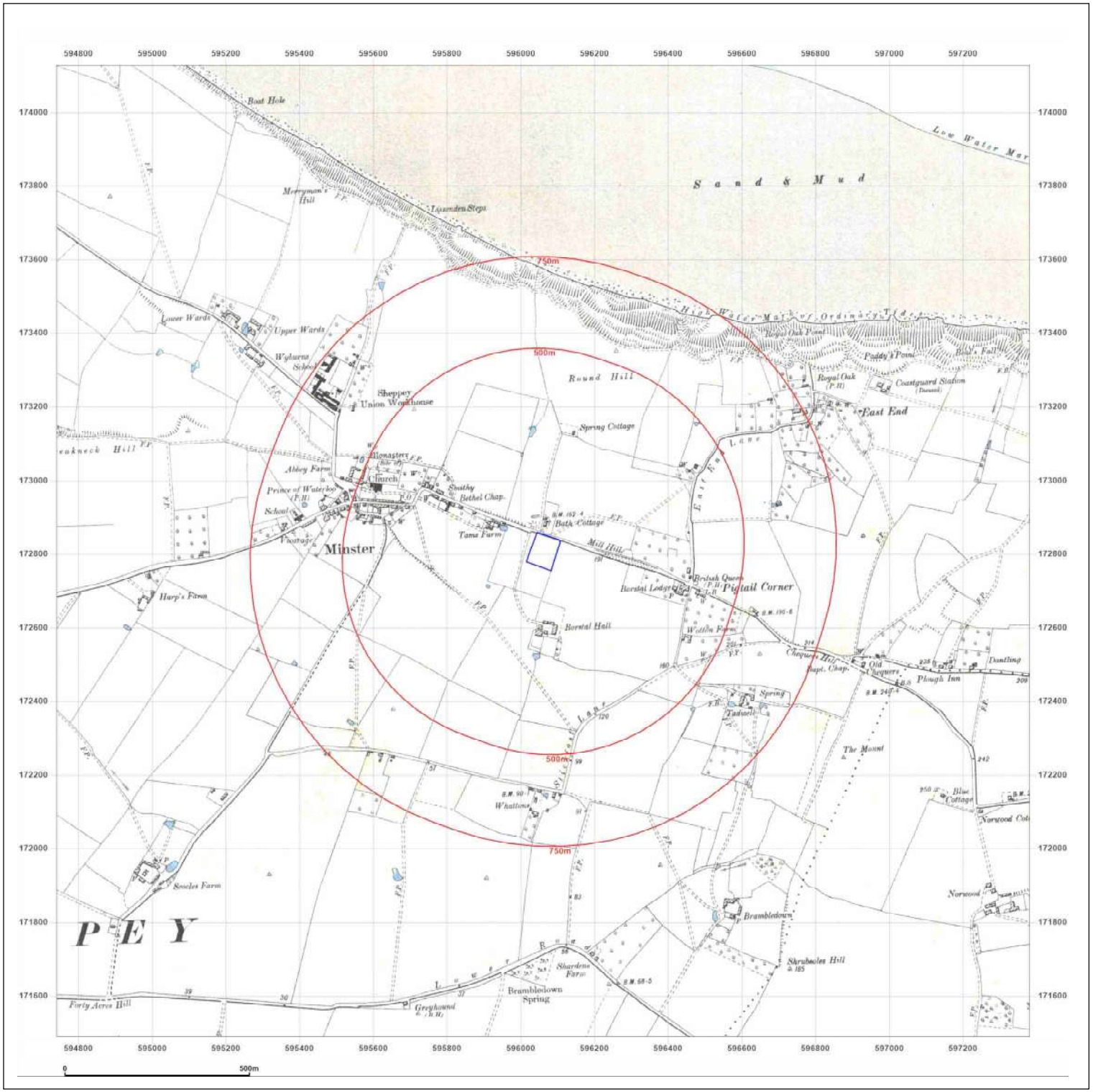

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FOR A BETTER POINT OF VIEW

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Boundary Close, Minster-On-Sea, Sheppey, ME12 3RG

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Printed at: 1:10,560

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Surveyed 1864
Revised 1896
Edition N/A
Copyright N/A
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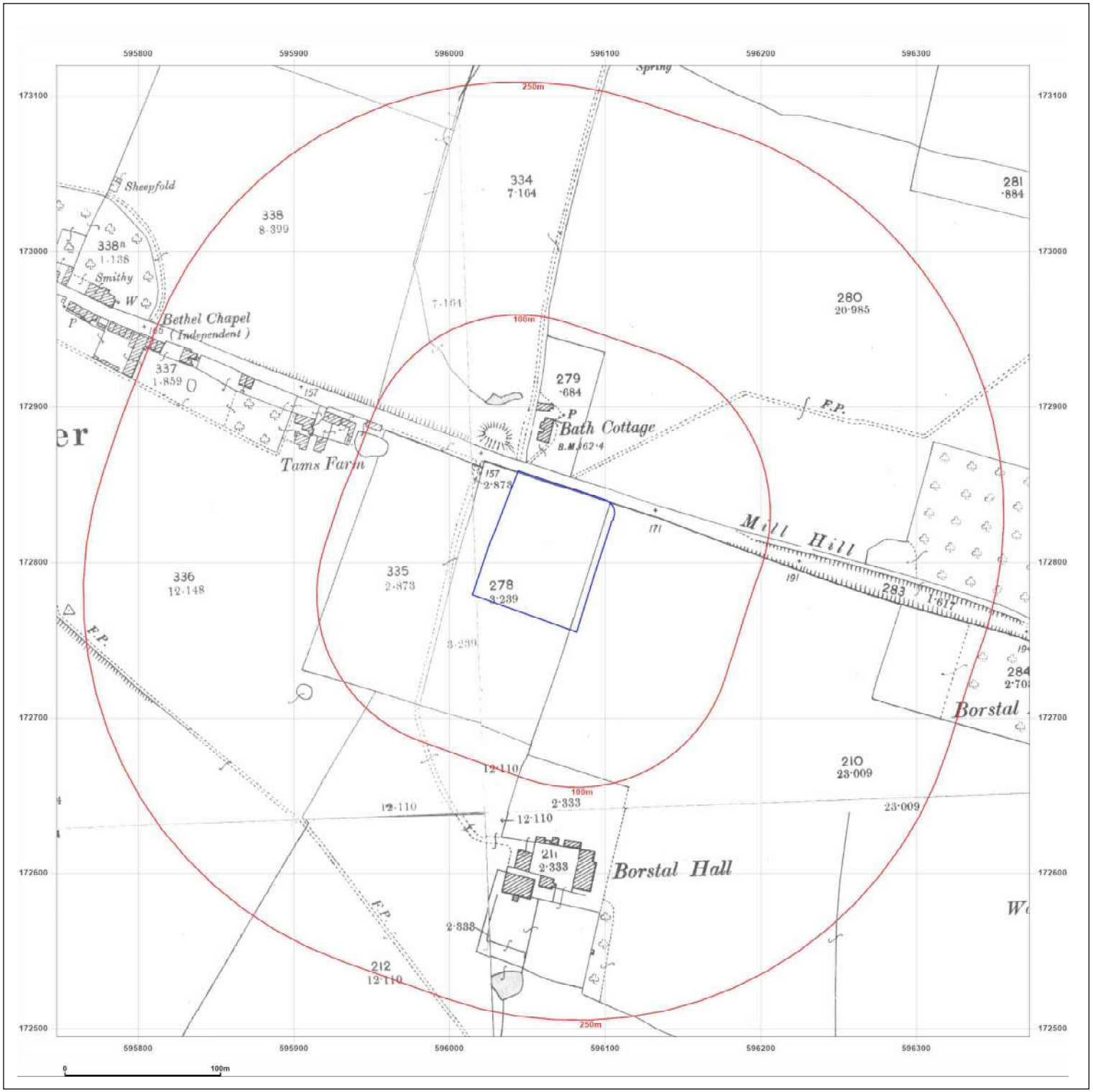

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FOR A BETTER POINT OF VIEW

Site Details:

Boundary Close, Minster-On-Sea,
Sheppey, ME12 3RG

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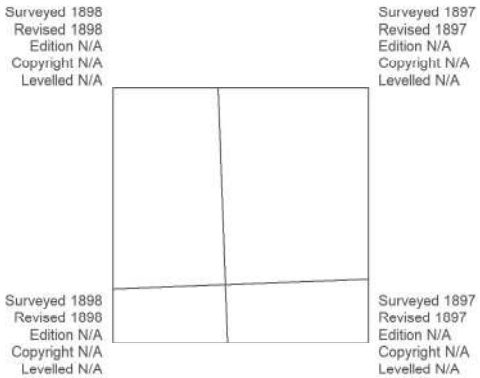

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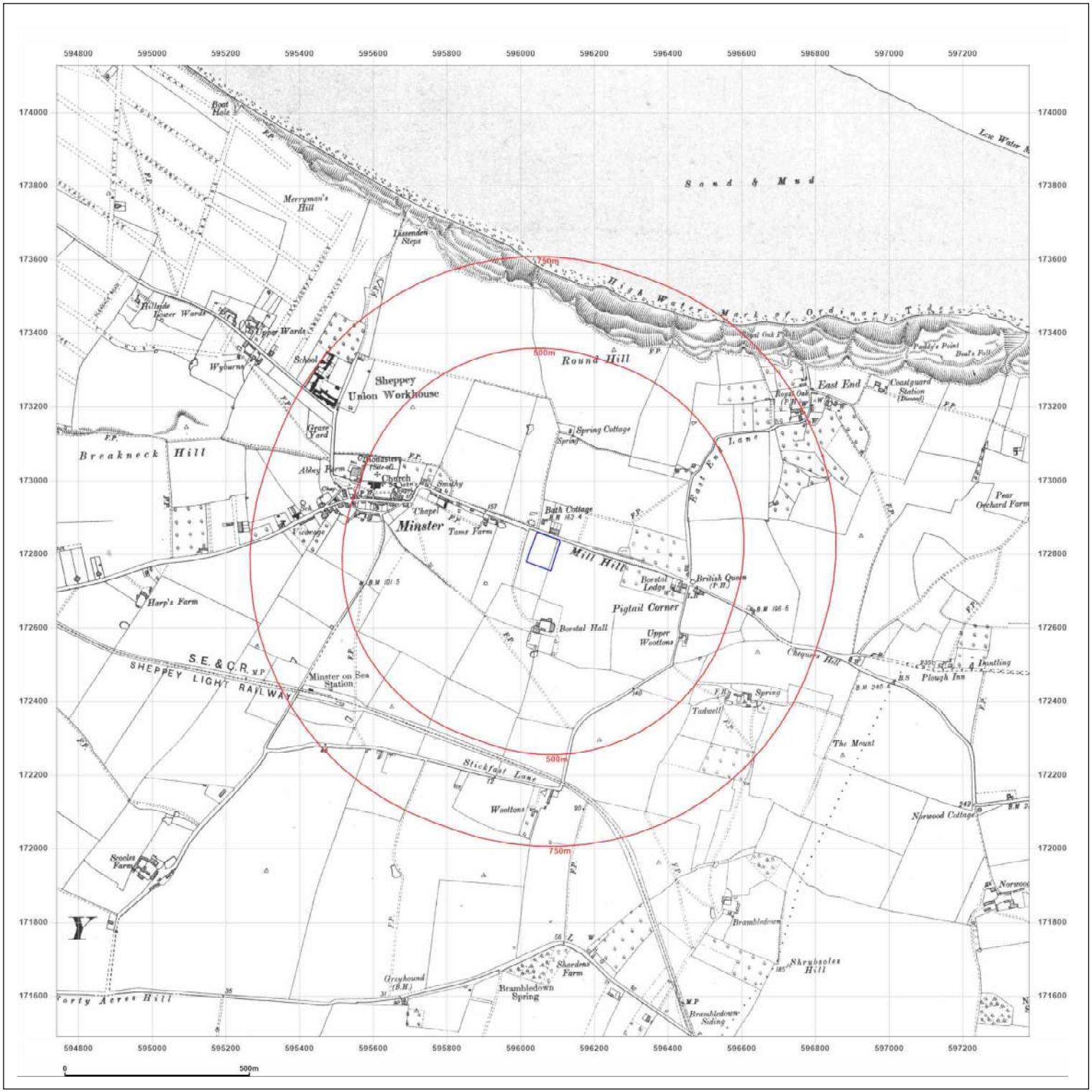

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Revised 1906
Edition N/A
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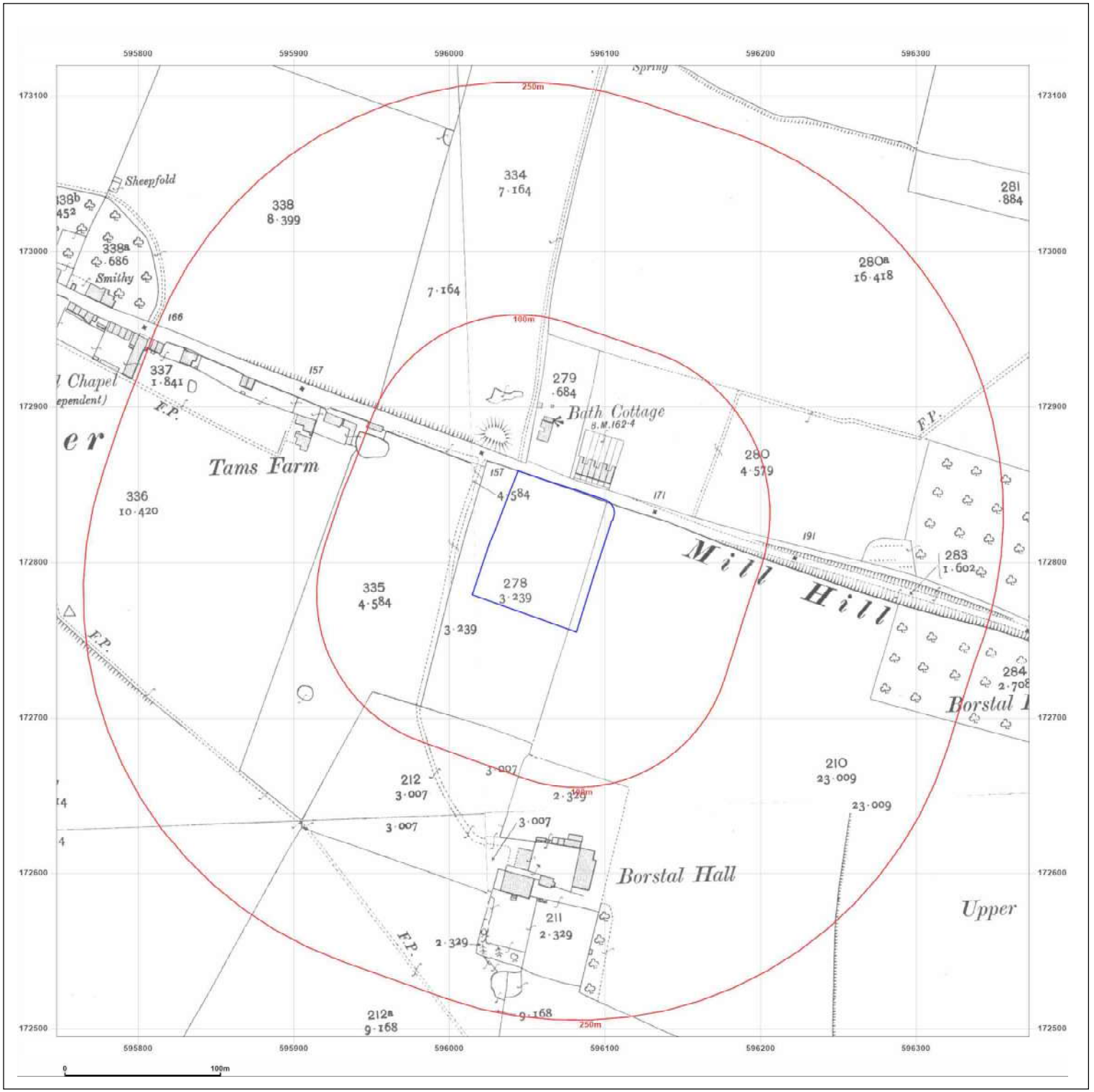

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Sheppey, ME12 3RG

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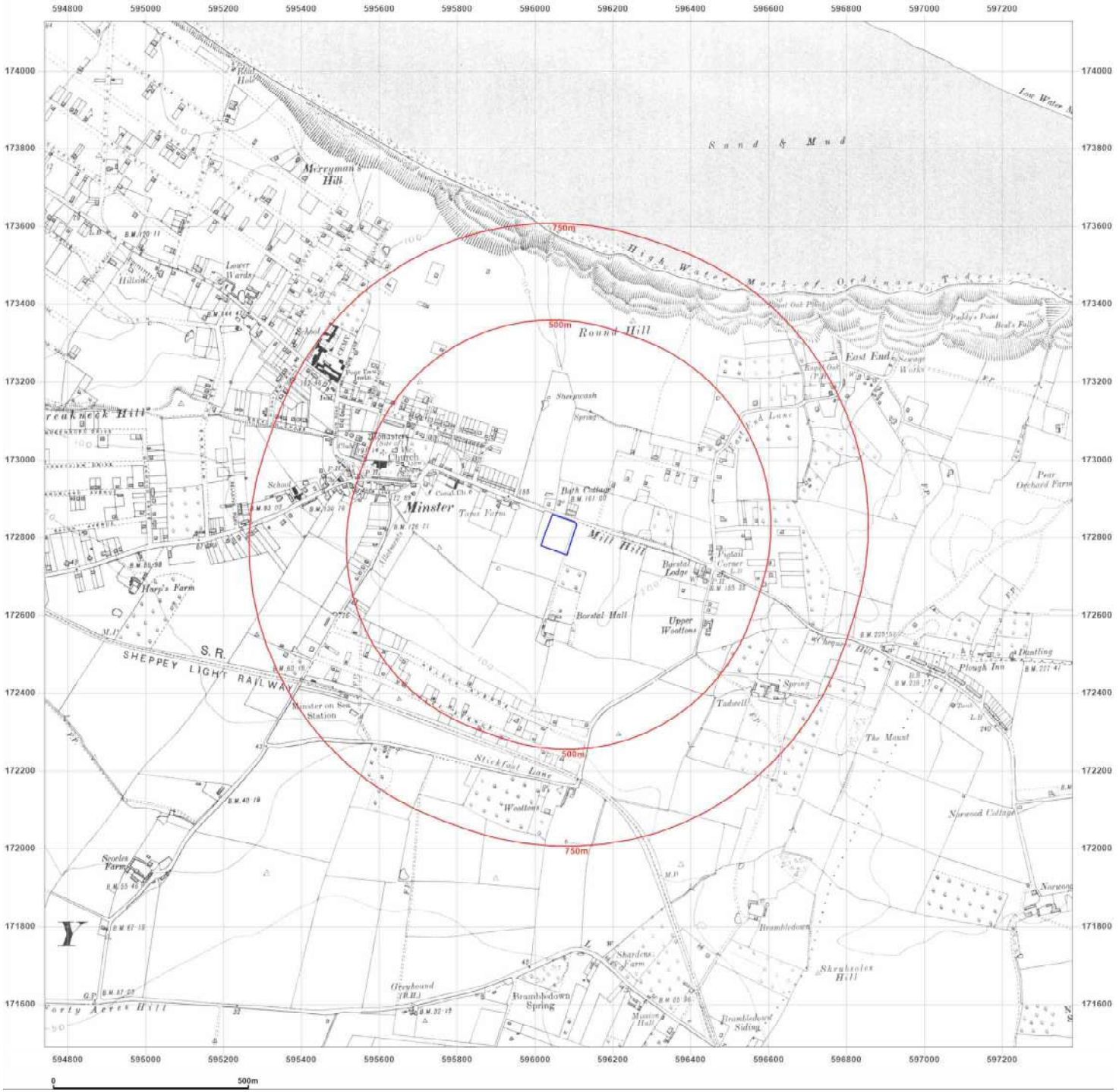

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Edition N/A
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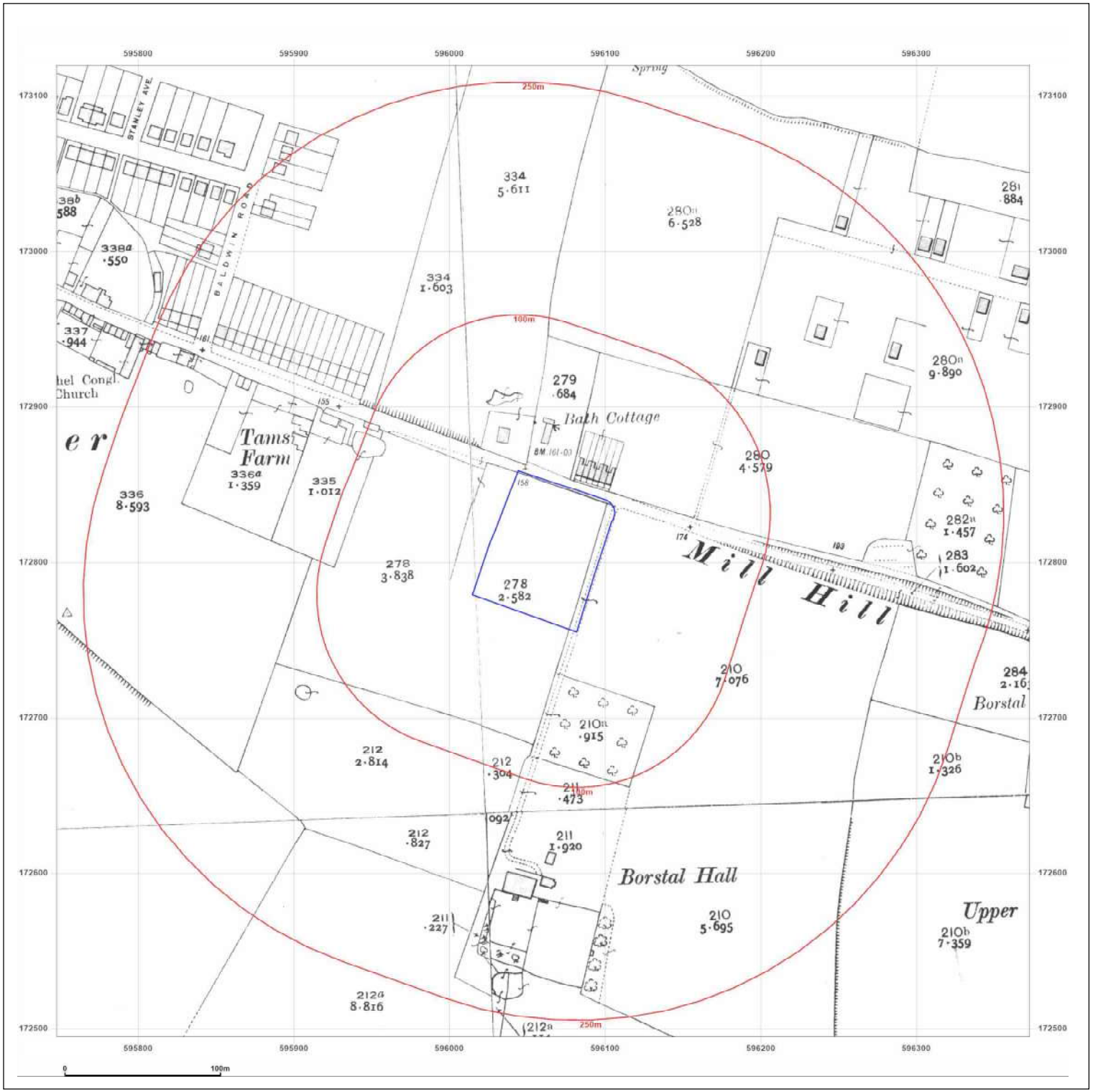

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Sheppey, ME12 3RG

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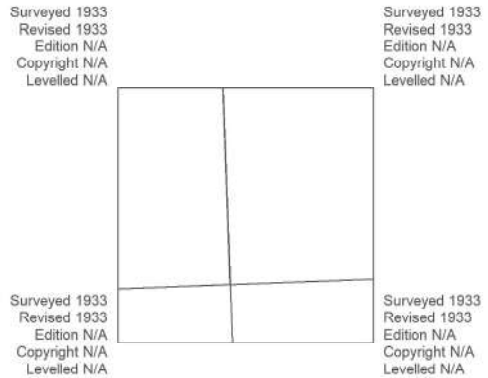

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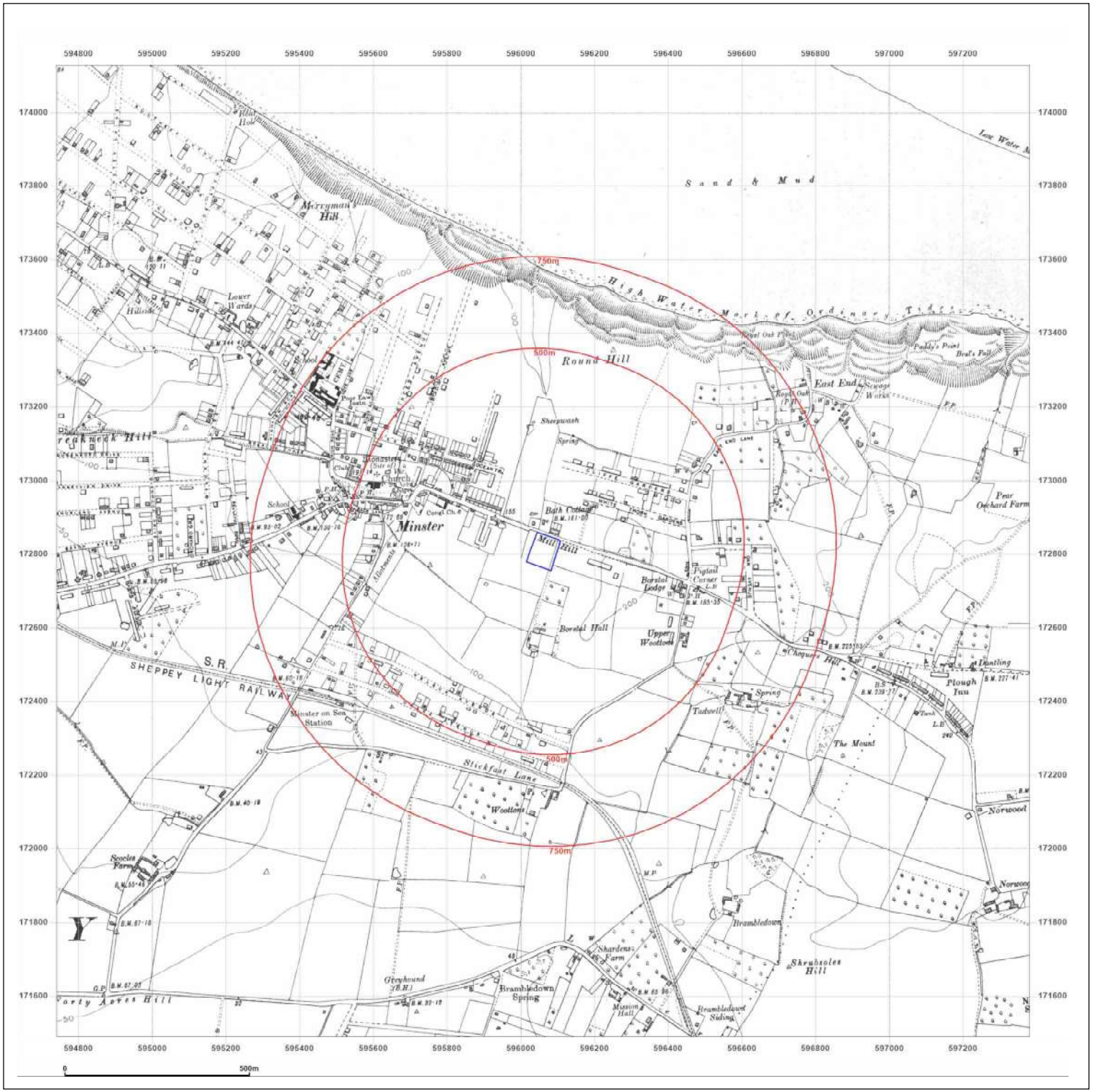

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Sheppey, ME12 3RG

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Report Ref: CMAPS-CM-1136987-61952-221123HIS
Grid Ref: 596060, 172807

Map Name: County Series
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Printed at: 1:10,560

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