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PHASE I ENVIRONMENTAL ASSESSMENT
(DESK STUDY REPORT)

Site: 23 High Street, Swanscombe, Near Dartford, Kent DA10 0AG

Prepared for: Chopra and Associates

Date: 26th March 2019

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CLIENT: Chopra and Associates

SITE: 23 High Street, Swanscombe, Near Dartford, Kent DA10 0AG

JOB NUMBER: 08494/25

DATE: 26th March 2019

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Executive Summary

Soiltec Laboratories Limited was instructed by Mr P Chopra on behalf of Chopra and Associates to carry out a Phase 1 Environmental Assessment (Desk Study) of the site at

23 High Street, Swanscombe, Near Dartford, Kent DA10 0AG

A planning application has been submitted to Dartford Borough Council (reference 17/01833/COU). A desk study report is required to address condition 5 of the granted application and also various sections of the National Planning Policy Framework (Revised NPPF 2018).

The site is on the east side of the High Street and is currently occupied by a dental surgery and two residential flats. It is proposed to convert the existing dental surgery into a studio flat and construct and new detached dental surgery.

From the investigations carried out for this desk study the site was undeveloped in the mid 1860's until at least the early 1870's. By the late 1800's the site was developed with the main building that remains to date as well as buildings in the centre and at the east boundary. By the early 1930's buildings covered the whole site until the late 1940's. By the early 1950's only some of the buildings remained but by the early 1970's the site was occupied by buildings, which appear to be outbuildings/garages or stores, which remained until at least 2003. By 2006 only the main building and a building at the east boundary remained. The building at the east boundary was demolished between 2007 and 2013. The site has been used as a dental surgery with residential flats but could also have been used a shop for building materials and builders yard, motor repairs and spraying many years ago although this has not been confirmed.

The immediate surrounding areas to the east were also farmland from the mid 1860's until at least the early 1870's. By the late 1800's this area was a large chalk pit that continued until at least the 1920's but was disused by the early 1930's. This area was used as a landfill site from 1978 to 1993. Some of the houses in the area date from the mid 1860's but the immediate area was developed with the terraced houses and small shops that remain to date by the late 1800's. The railway further to the north also dates from at least the mid 1860's and the station from at least the early 1930's.

The predominant underlying bedrock geology is The Lewes Nodular, Seaford and Newhaven Chalk Formations (chalk with flints) of very high permeability with The Boyn Hill Gravel Member drift deposits (sand and gravel) and thus the site is overlying a principal aquifer and is within a groundwater source protection zone.

There are no current surface water abstractions for potable water but there is one for other uses in the area (within 2km). This is 1.3km from the site for mineral washing.

There are current groundwater abstractions for potable water and other uses in the area (within 2km). The nearest is just less than 1.3km from the site for mineral washing and the nearest potable water abstraction is 1.7km from the site.

The findings of this report indicate that the site represents a **very low to moderate environmental risk** and that a phase II intrusive investigation of the site is required.

Gas protection measures are required for the new building and advice should also be sought regarding gas protection measures in existing buildings, with particular regard to the proposed conversion of the existing dental surgery to a studio flat.

1. Introduction

Soiltec Laboratories were instructed by Mr P Chopra on behalf of Chopra and Associates to carry out a Desk Study of the site at; 23 High Street, Swanscombe, Near Dartford, Kent DA10 0AG (grid reference at the site centre 560622 174687). The site is approximately 28 metres above ordnance datum (AOD) in the small town of Swanscombe, 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, English Nature and The Health Protection Agency.

The site is on the east side of the High Street and is currently occupied by a dental surgery and two residential flats. It is proposed to convert the existing dental surgery into a studio flat and construct and new detached dental surgery.

Site plans showing the location, existing layout, proposed layouts and elevations are 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 0.02ha (200m^2) and is on the east side of High Street in the town of Swanscombe. The centre of Swanscombe is approximately two hundred yards to the south.

It is located in an area of medium to high density residential and agricultural use although there are small business premises in the area.

An aerial photograph of the site dated June 2015 is shown in appendix 2.

Immediately to the north of the site are terraced residential houses in the High Street. Approximately 80m to the north is a main railway line and Swanscombe station. Beyond the railway are a few residential houses in All Saint's Close and the A226 trunk road with commercial/industrial estates beyond. To the northwest beyond the railway is a small trading estate.

Immediately to the west of the site on the opposite side of High Street are terraced residential houses with residential houses in Orchard Close beyond. Just to the west/southwest are residential houses in The Grove. Approximately 150m from the site at the nearest point is a large recreation ground. The sports pavilion is approximately 150m to the southwest. Beyond the recreation ground are residential houses, which approximately 260m from the site at the nearest point. To the northwest are terraced residential houses and a few small shops in the High Street, and terraced houses in Alma Road.

Immediately to the south of the site is an access drive to the rear of the site and the adjacent houses and shops in the High Street. Beyond the access drive are terraced small shops many with residential accommodation on the first floor as well as terraced houses in the High Street.

Approximately 60m and 100m to the southwest are a small fire station and a small car park respectively. Just beyond the car park is a council office. Further to the south are residential houses in Milton Road and Stanhope Road with residential houses beyond.

Immediately to the east of the site is part of the access drive with a large area of scrubland beyond, which extends to at least 400m to the east and more than 500m to the southeast. Beyond the scrubland is a main railway line.

2.1.1 Walkover Survey

The walkover survey was carried out on the 20th March 2019. At the time of the walkover survey the site was in full use as a dental surgery and residential flats.

The dental surgery was open for business and the flats were occupied.

The site was completely hard cover occupied by the existing building, block paved parking area and a part built blockwork building at the east boundary. The part built blockwork building is to be demolished and replaced by the new dental surgery building.

The dental surgery had vinyl floor covering, with the waiting and reception area as well as the consulting room all in a very clean good condition. No access could be gained to the residential flats. The parking area between the main building and the part built building was block pavoirs. The pedestrian access to one of the flats at the north elevation was also block pavoirs.

The internal area of the part built block building was completely covered with domestic waste items (mattresses, furniture, fridge freezer, UPVC window frames, a few tyres and broken building blocks.

The access drive immediately to the south was concrete hard cover and the access drive immediately to the east was gravel. The building was of brick construction with a tiled roof.

No vegetation was on the site but all vegetation adjacent to the site appeared to be in a healthy condition, which includes the area of scrubland (former landfill) to the east.

There were no above ground tanks on or adjacent to the site and there was no evidence of any former above ground tanks. There were no below ground 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 is one current or former fuel station within 250m.

This is a former fuel station that was located 210m south of the site. It is unlikely to have impacted the site.

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

This is shown in appendix 5 (current land use map).

2.2 Hydrology

There are no surface water features on, adjacent or near to the site. There are no underground watercourses in the area.

This is shown in appendix 5 (hydrology – watercourse network and river quality map).

3. Historical Site use

3.1 1865 to 1872

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.

Some of the roads in the area were constructed including the High Street, the road that is now The Grove just to the west/southwest as well as Milton Road and Stanhope Road further to the south. Some of the houses were in the area including the terraced houses on the opposite side of the High Street and a few houses in The Grove as well as a few houses to the northwest that are now in Alma Road. To the north the main railway line was constructed but not Swanscombe station. Beyond the railway were Galley Hill Farm and the road that is now the A226. The centre of Swanscombe was much further to the south at this date.

The site and surrounding areas remained unchanged until at least 1872.

3.2 1895 to 1923

By 1895 the site had been developed with the building that is now the dental surgery fronting the High Street as well as small buildings in the centre of the site and at the east boundary. The access drive immediately to the south and east of the site that remains to date had also bee constructed. Many houses had been built in the area including the terraced houses immediately to the north and south as well as houses in Milton Road and Stanhope Road further to the south many of which remain to date. Approximately 80m to the south/southeast was a smithy and approximately 130m to the east was a chalk pit with tramways in the chalk pit. Beyond the railway line further to the north All Saints Church had been built and another chalk pit is to the east of the church also with tramways. A few more houses had been built to the west of the church and an old chalk pit is immediately beyond the 'A226'.

By 1909 the chalk pit excavations extended to immediately beyond the access drive at the east boundary and the tramways had been extended. An allotment is immediately beyond the smithy to the southeast and another allotment is immediately beyond The Grove to the west/southwest. The site remained unchanged.

The site and immediate surrounding areas remained unchanged until at least 1923.

3.3 1932 to Date

By 1932 buildings covered the whole of the site and the chalk pit to the east is marked as an old chalk pit. To the north Swanscombe Halt (now Swanscombe Station) had been built and the smithy is no longer marked. The allotment immediately beyond The Grove is no longer marked and there embankments around the former allotment area. An old chalk pit is also marked approximately 230m to the west.

The site and immediate surrounding areas remained unchanged until at least 1948.

By 1952 some of the buildings are no longer on the site with the main building in the west area, small buildings in the centre and a building at the east boundary remaining. There is a pump house approximately 60m to the east/southeast on the former chalk pit and a pipeline in the former chalk pit. The excavations are still marked although most of the area is wooded. The former allotment further to the southwest is marked a scrub and a few more houses had been built in the area. A rifle range is immediately beyond the railway to the north.

By 1971 buildings cover the whole site. The former allotment further to the southwest is marked as a recreation ground and the fire station to the southwest had been built, which all remain to date. The allotment to the southeast is no longer marked and the former chalk pit to the east is marked as scrub.

By 1977 a large pond is marked on the former chalk pit approximately 350m to the southeast that remains to date and the former chalk pit is marked as a 'refuse tip or slag heap', which remained until at least 2002.

The site and immediate surrounding areas have generally remained unchanged to date.

An assessment of historic satellite imagery shows that buildings covered the whole site until at least 2003 but not by 2006 and a building occupied the east area of the site until 2007 but not by 2013.

Copies of historic satellite images are shown in appendix 2.

3.4 Planning & Uses

Following an assessment of Dartford Borough Council planning website there has been nineteen historical planning applications for the site apart from the current application, which has been submitted and granted (reference 17/01833/COU). Tabulated below is the historical application. Council online records for the area date from at least 1949.

Date	Planning Details
1962	Change of use of retail shop premises to shop for builders materials and rear as a builders yard – granted
1963	Use of first floor residential accommodation as a dental surgery – granted
1965	Advertisement sign – granted
1967	The repair and sale of used cars – refused
1971	Use of existing building as workshop for the assembly of tanks for motor cycles – granted
1973	Use of existing building for spraying and general vehicle repairs – granted
1976	Continued use of ground floor to dental surgery and use of outbuilding as dental workshop – granted
2003	Erection of a part two, part single storey rear extension to provide 3N^{o} one bedroom flats – refused
2006	Demolition of single storey rear extension and erection of a two storey rear extension together with an enclosed staircase and internal alterations to form 2N^{o} one bedroom flats – granted
2008	Erection of a detached two bedroom house – refused
2009	Conversion and part rebuild of outbuilding for dental surgery – granted
2010	Change of use of building to provide 1N^{o} one bedroom flat and 1N^{o} two bedroom flat together with associated alterations to elevations and provision of car parking – refused
2010	Change of use of ground floor of property from dental surgery to self contained one bedroom flat with associated car parking – granted
2011	Application for a non material amendment following grant of 2009 planning permission in respect of raising ridge line of southern section roof to match height of northern section – granted
2012	Conversion and part rebuild of outbuilding for dental surgery with provision of dormer window to side elevation and pitched roof to other side elevation in connection with providing 'dentist on night call' accommodation at first floor level (revisions to 2009 planning permission in respect of provision of dormer window to create 'dentist on night call' accommodation and raising ridge line of southern section of roof to match northern section) – refused
2013	Application for a new planning permission to replace extant planning 2010 permission for change of use of ground floor of property from dental surgery to self contained one bedroom flat with associated car parking – granted
2013	Conversion and part rebuild of outbuilding for dental surgery with provision of dormer window to side elevation in connection with providing additional store/office at first floor level and raising ridge line of southern section of roof to match northern section – granted
2014	Conversion and part rebuild of outbuilding with provision of dormer window to side elevation and raising ridge line of southern section of roof to match northern section for use of outbuilding as a single storey dwelling with side dormer to provide additional room in roof space – refused
2017	Erection of a two storey rear extension to provide 1N^{o} two bed self-contained flat with associated parking and amenity space and a single storey rear extension to existing dental surgery – withdrawn

The current land use data indicates that there are several current or former 'industrial sites' within 250m of the site.

The nearest and only two within 100m are the fire station to the southwest and railway further to the north. These sites and the others listed, which are the small shops and businesses in the area are all unlikely to impact the site.

This is shown in appendix 5, Environmental Maps (current land use map).

4. Environmental Sensitivity

4.1 Site Sensitivity

The site is not within a site of special scientific interest, special protection area, a special area of conservation, RAMSAR (wetlands) site, a nature reserve, environmentally sensitive area, a world heritage site, ancient woodland, an area of outstanding natural beauty, a national park or an area of greenbelt land.

The site is within a designated nitrate vulnerable zone.

This is all shown in appendix 5 (designated environmentally sensitive sites map).

The site is not within an area that is at risk of flooding from rivers or sea without defences.

The risk of flooding from rivers and sea (RoFRaS) map shows that the risk is 'very low '.

"The Environment Agency RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection. RoFRaS data for the study site indicates the property is in an area with a **Very Low** (less than 1 in 1000) chance of flooding in any given year". (Reference EA/Groundsure report)

This is shown in appendix 5 (Environment Agency flood maps).

The site is within an area where there is a limited potential for groundwater flooding – clearwater flooding (with unconfined aquifers). "Where limited potential for groundwater flooding to occur is indicated, this means that although given the geological conditions there may be a groundwater flooding hazard, unless other relevant information, e.g. records of previous flooding, suggests groundwater flooding has occurred before in this area, you need take no further action in relation to groundwater flooding hazard". (reference BGS)

4.2 Potentially Contaminative Use

The site is not within an area of potentially contaminative use from heavy industrial uses although there have been industrial uses in the area.

There are areas of potentially infilled land, industrial sites and/or major energy features within 250m of the site.

The former chalk pits adjacent to the east and in the area, the railway line further to the north are all marked as industrial land use.

The chalk pits and railway cuttings are also marked as 'potentially infilled land'. The chalk pits adjacent and near to the site could impact the site if they have been infilled.

There are no major energy features within 250m of the site.

This is all shown in appendix 5 (historical land use map).

There are historic surface ground workings, historic underground workings or current ground workings marked within 250m on the ground workings map in appendix 5.

The former chalk pits adjacent to the east and in the area, the railway line further to the north are all marked as historic surface ground workings. The former chalk pit to the east could affect the site.

The former pipeline in the former chalk pit to the east is also marked as historic underground workings, which is unlikely to affect the site.

All the 'current' groundworkings marked are the former chalk pits that ceased many years ago.

The railways and tunnels map in appendix 5 shows that there are existing railways, former railways, tunnels and/or proposed railways within 250m.

The existing railway is marked further to the north, which is unlikely to impact the site.

The tramways on the former chalk pits are also shown, which are also unlikely to impact the site.

There are no tunnels or proposed railways on the site or within 250m.

There are areas of reclaimed ground, made ground, infilled ground, disturbed ground, worked ground and/or landscaped ground within 500m of the site as shown on the artificial ground map in appendix 5.

The nearest (within 250m) are as follows:
Area 1 on the map (10m E) is infilled ground (artificial deposit)
Area 2 on the map (60m S) is infilled ground (artificial deposit)
Area 3 on the map (70m N) is worked ground
Area 4 on the map (120m N) is worked ground
Area 5 on the map (200m N) is worked ground
Area 6 on the map (210m W) is infilled ground (artificial deposit)
Area 7 on the map (250m SE) is worked ground

Area 1 could affect the site.

4.3 Landfill and Waste Transfer Sites

There are current or former EA registered historical licensed landfill sites or local authority registered licensed landfill sites within 250m.

The former chalk pit immediately to the east and further to the northeast beyond the railway line are former EA registered historical licensed landfill sites that accepted household, industrial and commercial waste from 1978 until 1993. The landfill site immediately to the east could impact the site.

There is one current or former registered waste treatment or other waste site within 250m.

This is a waster transfer station and treatment site for inert waste located 230m to the north, which is unlikely to impact the site.

This is all shown in appendix 5 (landfill and other waste sites map).

4.4 Hydrogeology

The site is classified by the Environment Agency (EA) as overlying a secondary aquifer within the superficial geology.

These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into two types:

Secondary A - 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.

Secondary B - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.

The site is classified as overlying a secondary 'A' aquifer within the superficial geology.

The site is classified as overlying a principal aquifer within the bedrock geology.

These are layers of rock or drift deposits that have high intergranular and/or fracture permeability usually providing a high level of water storage. They may support water supply and/or river base flow on a strategic scale. Generally, principal aquifers were previously designated as major aquifers.

The site therefore could be classed as overlying a principal (major) aquifer.

The site is also within a groundwater source protection zone (SPZ). The site is within a SPZ 3, total catchment. Total catchment is defined by the EA as the area around a source within which all groundwater recharge is presumed to be discharged at the source. In confined aquifers, the source catchment may be displaced some distance from the source. For heavily exploited aquifers, the final source catchment protection zone can be defined as the whole aquifer recharge area where the ratio of groundwater abstraction to aquifer recharge (average recharge multiplied by outcrop area) is >0.75. There is still the need to define individual source protection areas to assist operators in catchment management.

This is all shown in appendix 5 (hydrogeology maps).

4.5 Geology

According to geological information, British Geological Survey sheet 271, Dartford, the site is underlain by Upper Chalk with Boyn Hill Gravel drift deposits.

This is also shown on the superficial deposits and landslips map in appendix 5 which shows that there are superficial deposits on the site and in the area.

Area 1 on the map (on site) is The Boyn Hill Gravel Member (sand and gravel)
Area 2 on the map (110m N) is The Boyn Hill Gravel Member (sand and gravel)
Area 3 on the map (370m NW) is The Boyn Hill Gravel Member (sand and gravel)
Area 4 on the map (460m E) is head deposits (clay, silt, sand and gravel)

There are no areas of landslip deposits within 500m.

The bedrock and faults map in appendix 5 shows that The Lewes Nodular, Seaford and Newhaven Chalk Formations – undifferentiated (chalk) is the bedrock geology on the site of very high permeability (area 1 on the map).

Area 2 on the map (380m SW) is The Thanet Formation (sand)

There are no fault lines marked within 500m.

There are twenty six previously drilled boreholes marked within 250m of the site.

The nearest was drilled 50m northwest of the site to a depth of 8m in 1977. The strata recorded were brown sandy clay and brown gravel and sand to 3.1m (Boyn Hill Gravel) with chalk with occasional flints beneath the gravel and sand. No water was encountered.

The next nearest was drilled 60m east of the site to a depth of 111m in 1908 or before. The strata recorded chalk with flints throughout the borehole. The rest water was at 5.5m in 1948.

This is shown in appendix 5 (borehole records map).

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 shown in appendix 5 (environmental permits, incidents and registers map).

5.2 Abstraction Consents

There are twenty one current or former groundwater abstraction consents within 2000m of the site.

The nearest is a former consent located 870m north of the site that was for dust suppression use.

The nearest current consent is located 1290m north of the site for mineral washing. There is one current groundwater abstraction for potable water supplies, which is located 1720m south of the site for public use.

There is one current or former surface water abstraction consent for potable water supplies and/or other uses within 2000m of the site.

This is a current consent located 1300m east of the site for mineral washing. There are no surface water abstractions for potable water supplies.

This is shown in appendix 5 (hydrogeology – abstraction licence, SPZ and potable water abstraction maps), which shows up to 500m only.

5.3 Pollution Incidents and Permits

There are no recorded pollution incidents within 250m of the site.

There is one current or former authorised activity enforcement within 250m of the site. This is a Part B permit for dry cleaning processes 150m south of the site, which is unlikely to impact the site.

There are no integrated pollution control permits, dangerous substances inventory sites and/or radioactive substances authorisations within 250m of the site.

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 (environmental permits, incidents and registers map).

6. Mining Hazards, Subsidence and Radon

6.1 Mining

The site is not within an area that may be affected by historic coal mining hazards.

There are three natural cavities within 500m of the site.

The nearest is located 60m east of the site and is recorded as a solution pipe (x4).

The others recorded are:
460m SE – solution pipe (x3)
490m S – solution pipe (x1) and a sink hole (x1)

There are no non coal mining cavities within 500m and the site is within an area where the non coal mining activity is classed as 'rare'.

This is all shown in the mining, extraction and natural cavities map in appendix 5.

6.2 Subsidence

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

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

The ground dissolution subsidence hazard is classed as 'low hazard'. Low hazard indicates that "Significant soluble rocks are present. Low possibility of subsidence occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow. Consider implications for stability when changes to drainage or new construction are planned. For new build, site investigation should consider potential for dissolution problems on the site and its surroundings. Care should be taken with local drainage into the bedrock. For existing property, possible increase in insurance risk due to soluble rocks".

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

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

The running sand stability hazard is classed as 'very low hazard'.

All the above are shown on the ground stability maps in appendix 5.

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.

7. Recommendations

7.1 General

From the investigations carried out for this desk study the site was undeveloped in the mid 1860's until at least the early 1870's. By the late 1800's the site was developed with the main building that remains to date as well as buildings in the centre and at the east boundary. By the early 1930's buildings covered the whole site until the late 1940's. By the early 1950's only some of the buildings remained but by the early 1970's the site was occupied by buildings, which appear to be outbuildings/garages or stores, which remained until at least 2003. By 2006 only the main building and a building at the east boundary remained. The building at the east boundary was demolished between 2007 and 2013. The site has been used as a dental surgery with residential flats but could also have been used a shop for building materials and builders yard, motor repairs and spraying many years ago although this has not been confirmed.

The immediate surrounding areas to the east were also farmland from the mid 1860's until at least the early 1870's. By the late 1800's this area was a large chalk pit that continued until at least the 1920's but was disused by the early 1930's. This area was used as a landfill site from 1978 to 1993. Some of the houses in the area date from the mid 1860's but the immediate area was developed with the terraced houses and small shops that remain to date by the late 1800's. The railway further to the north also dates from at least the mid 1860's and the station from at least the early 1930's.

There are no surface water features on, adjacent or near to the site. There are no underground watercourses in the area.

The site overlies a principal aquifer and is within a groundwater source protection zone.

The Lewes Nodular, Seaford and Newhaven Chalk Formations (chalk with flints) is the bedrock geology on the site of very high permeability with The Boyn Hill Gravel Member drift deposits (sand and gravel).

There are current groundwater abstractions for potable water and other uses in the area (within 2km). The nearest is just less than 1.3km from the site for mineral washing and the nearest potable water abstraction is 1.7km from the site.

There are no current surface water abstractions for potable water but there is one for other uses in the area (within 2km). This is 1.3km from the site for mineral washing.

It is proposed that the surface water drainage for the new building will be discharged via the existing local mains system.

The foul drainage for the new building will also be discharged via the existing local mains system.

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 possible that the site has been impacted from its former uses (builder's yard, motor repairs and spraying). However, it has not been confirmed that the site was used as a builder's yard or for motor repairs and spraying but it should be verified that there has been no impact to the site from these 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 also possible (the former landfill site at the chalk pit).

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

It is possible that landfill gases are impacting the site from off site sources (the former landfill site at the chalk pit).

7.4 Conceptual Model

Using the Contaminated Land Exposure Assessment (CLEA) model and associated Contaminated Land Report (CLR11, Model Procedures for the Management of Land Contamination) framework to assess sites, a Source (contaminant) – Pathway – Receptor approach is used.

Source – (contaminant) "a substance that is in, on or under the land and has the potential to cause harm or to cause pollution of controlled waters"
Pathway – e.g. via air, soil or water "route or means by which a receptor can be exposed to, or affected by, a contaminant"
Receptor – e.g. humans, buildings and services, groundwater or surface waters "in general terms, something that could be adversely affected by a contaminant, such as people, an ecological system, property, or a water body"

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 from on site or off site former or current uses are:
Heavy metals (vehicle repairs, builder's yard and former adjacent landfill site)
Polyaromatic hydrocarbons (vehicle repairs, builder's yard and former adjacent landfill site)
Total petroleum hydrocarbons including BTEX compounds (vehicle repairs, builder's yard and former adjacent landfill site)
Asbestos (former buildings, builder's yard and former adjacent landfill site)
Landfill gases (former adjacent landfill site)

7.4.2 Pathway(s)

It is proposed to convert the existing dental surgery into a studio flat and construct and new detached dental surgery. There will be no private gardens or soft landscaping.

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 (during construction only)
Ingestion of dusts, gases and vapours (indoors)
Ingestion of dusts, gases and vapours (outdoors during construction only)
Dermal contact with soils (during construction only)

7.4.3 Receptor(s)

The potential receptors and associated risks for this site are:
Construction staff – very low to low risk
Residents and staff on site – very low to moderate risk (no apparent current impact)
Residents and shop staff off site – very low risk (no apparent current impact)
Converted and additional new building and below ground services – very low to moderate risk
Buildings off site – very low risk (no apparent impact to the adjacent dwellings and shops)
Groundwater (principal aquifer and SPZ) – very low risk (no likely contamination pathway)

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 26/03/19 is shown in appendix 6, conceptual model.

7.5 Investigation Work Recommended

7.5.1 General

As outlined above it is possible that there are sources of contamination on this site that could have impacted the site soils from the on site past activities had those uses been carried out on the site.

It is also possible that the site has been impacted by the uses and/or activities from the immediate surrounding areas.

The risk to human health could be classed as very low to moderate.

The risk to the new building and below ground services could also be classed as very low to moderate.

The site overlies a principal aquifer and is within a source protection zone (SPZ). It is proposed that the surface water drainage for the new building will be discharged via the local mains system and the site will be completely hard cover on completion of the development.

The foul drainage for the new building will be discharged via the existing local mains system.

The risk to controlled waters from the site now and on completion of the development could be classed as very low.

It is therefore necessary to carry out a phase II intrusive investigation of the site.

7.5.2 Sampling Locations and Analysis

Soils should be taken from various locations on the site within the new building footprint and analysed for a general suite of determinands that must include heavy metals, polyaromatic hydrocarbons, total petroleum hydrocarbons and BTEX compounds as a minimum.

Near surface soils must also be screened for the presence of asbestos fibres.

As mentioned above it is possible that landfill gas is impacting the site from off site sources from the adjacent former landfill site.

There are landfill gas and groundwater monitoring points on the former landfill site as well as a gas flame compound. There are three monitoring points immediately beyond the landfill site boundary fence that are approximately 15m from the site. There are also other monitoring points within 200m of the site.

Soiltec has assessed the gas monitoring results that have been supplied by the environment Agency for 2017 to the end of 2018.

The assessment of the landfill gas results was carried out in accordance with BS8485:2015+A1:2019 (Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings).

The results show that although most of the results for methane and carbon dioxide are below the typical threshold levels for methane (<1%) and carbon dioxide (<5%) giving a characteristic gas situation (CS) value of CS1. However, there are some gas readings that exceed these threshold values with methane values of up to 6.7%$^{v}/_{v}$ and carbon dioxide values of up to 17.7% $^{v}/_{v}$ being recorded during the monitoring period. Flowrates were negligible (mostly negative pressures and 0.0lhr^{-1} with a maximum recorded flow of 1.0lhr^{-1}) giving gas screening values of 0.07 to <0.7lhr^{-1}. Thus these values give a CS value of CS2.

It is therefore recommended that the following gas protection measures are incorporated within the construction of the new building:

A CS2 for a private or commercial/public building (possible multiple) (Type B building from table 3 in BS8485:2015+A1:2019) dictates that a minimum gas protection score of 3.5 from table 4 in BS8485:2015+A1:2019 must be used.

Thus using the subsequent tables in BS8485:2015+A1:2019 the following gas protection measures incorporated in the new building must be used:

A cast in situ monolithic reinforced ground bearing raft or reinforced cast in situ suspended floor slab with minimal penetrations,
PLUS:
A passive sub floor dispersal layer of good performance e.g. clear void,
PLUS:
A suitable gas resistant (sufficiently impervious*) membrane to meet <u>all</u> the criteria in column 1, table 7 in BS8485:2015+A1:2019 e.g. a minimum 0.4mm thickness (equivalent to 370g/m^2 for low density polyethylene) reinforced membrane (virgin polymer) installed above the floor slabs are considered sufficiently strong to meet all the performance criteria in column 1, table 7. Thicker and more robust membranes or an additional membrane protection layer should be installed directly beneath cast in situ floor slabs.

The above will give a gas protection score of 4.5

*A membrane with a gas transmission rate <40.0ml/day/m^2/atm (average) for sheets and joints (tested in accordance with BS ISO 15105-1:2007 manometric method) is regarded as sufficiently impervious.

The results of the groundwater analysis from the nearest monitoring point to the site (approximately 60m SE of the site) had a pH ranging from 8.1-8.5, sulphate ranging from 295mgl^{-1}to 474mg/l^{-1} with chemical oxygen demand (COD) ranging from 22mgl^{-1} to 50mgl^{-1}, which is low. The sulphate levels, if impacting the site could affect the concrete type used in the construction.

7.5.3 Timescale

The intrusive investigation work should be carried out following the demolition of the part built blockwork building and clearance of this area of the site subject to approval of this report by the local authority.

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

The 'informatives' section (points 2 and 3) of the planning decision notice advise the applicant to contact the local authority regarding the adjacent landfill site, gas protection membrane and contaminated land assessment. This should be carried out in conjunction with the submission of this report.

Advice should also be sought from the local authority and/or the Building Research Establishment (BRE) regarding gas protection measures in the existing buildings, with particular regard to the proposed conversion of the existing dental surgery to a studio flat.

Should any contaminants be encountered during the site investigation or 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 6.2 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 Dartford Borough Council or other regulators/insurers if applicable for their consideration and approval prior to the commencement of any works on the site.

K.D.Huxley CSci CChem MRSC MIEnvSc RSoBRA
Date: 26/03/19

APPENDIX 1

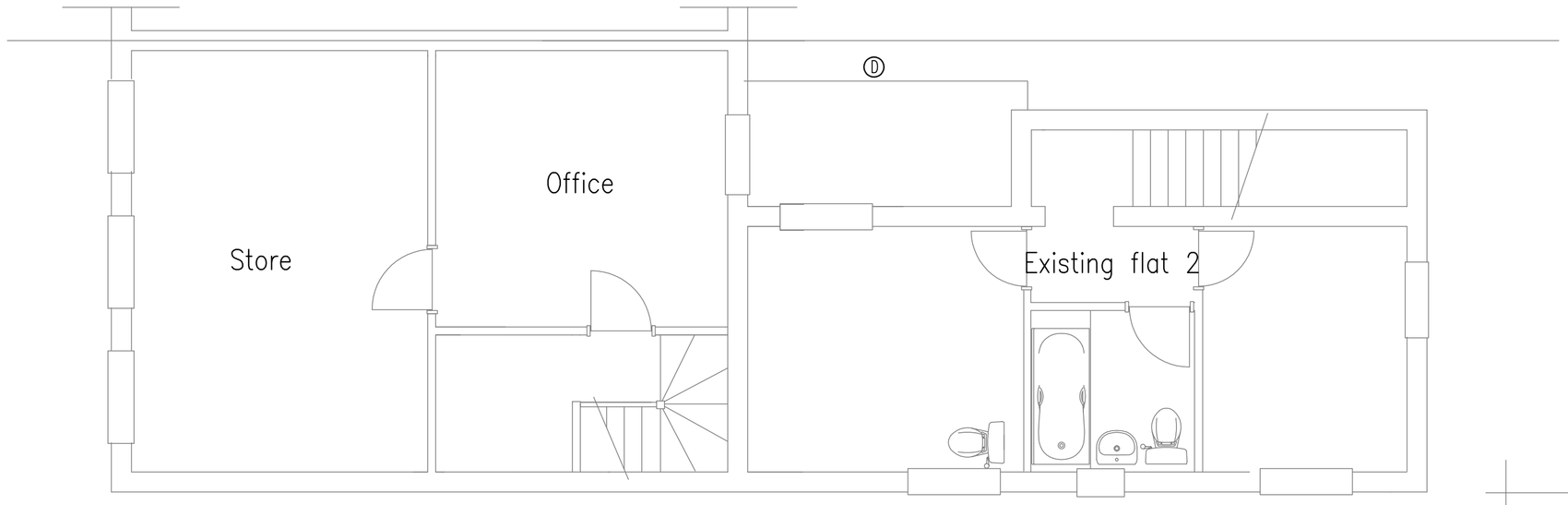
SITE PLANS

Ordnance Survey®

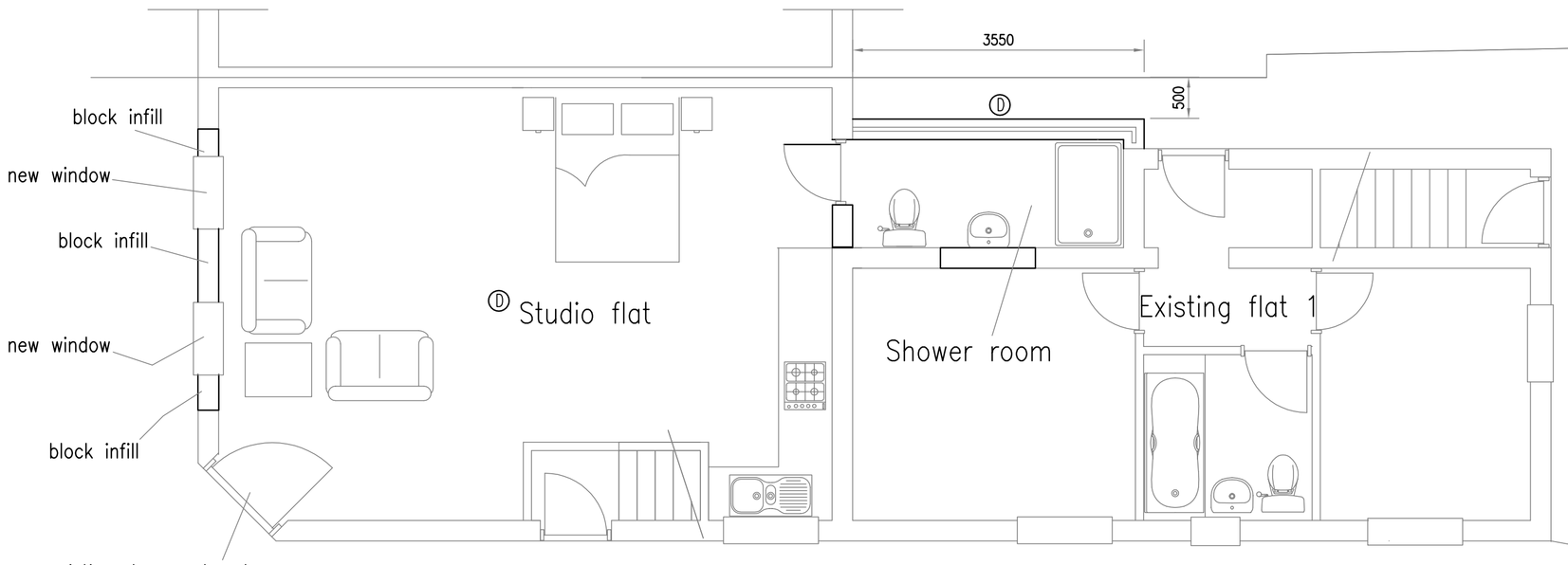
DARTFORD BOROUGH COUNC

24 OCT 2017

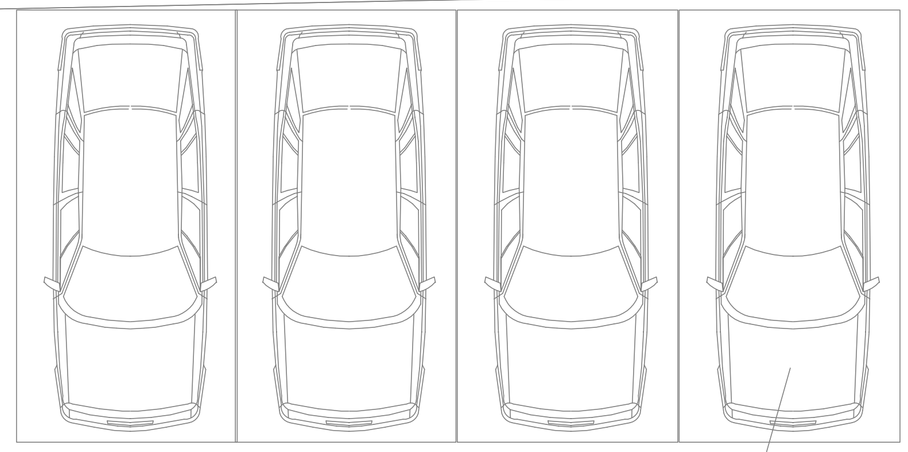
OS Site



EXISTING FIRST FLOOR PLAN Ⓓ

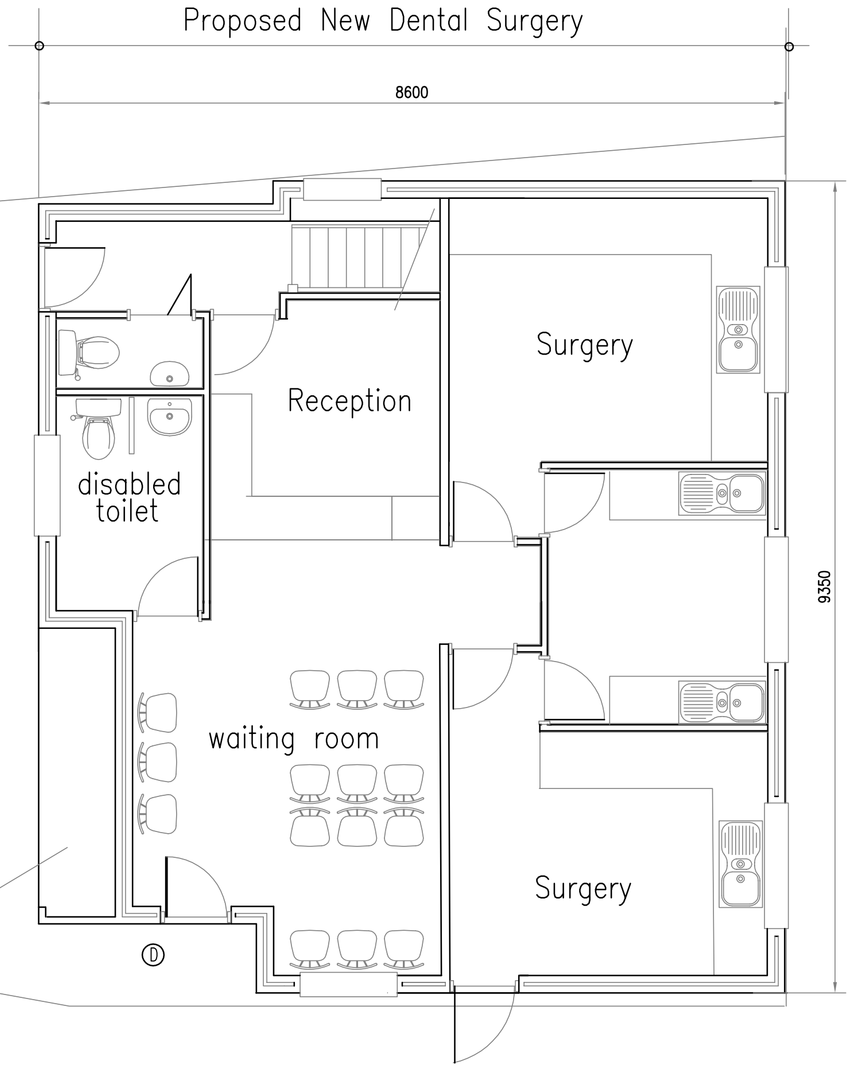


Existing Surgery converted
into one Studio flat accomadation

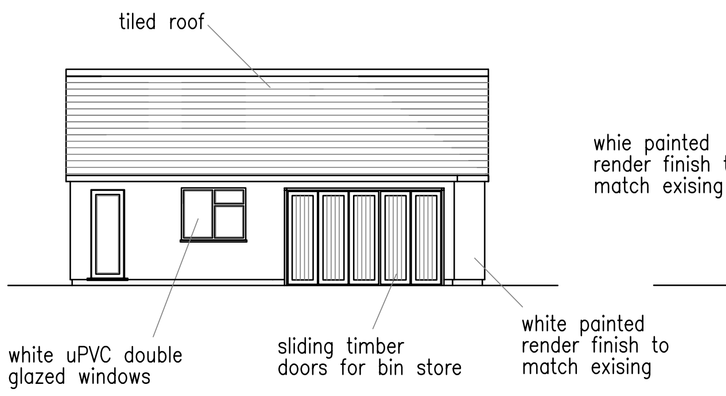


Flats & Studio Flat parking

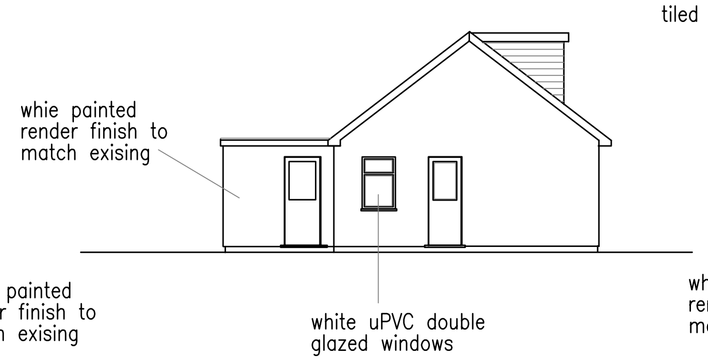
Disable parking



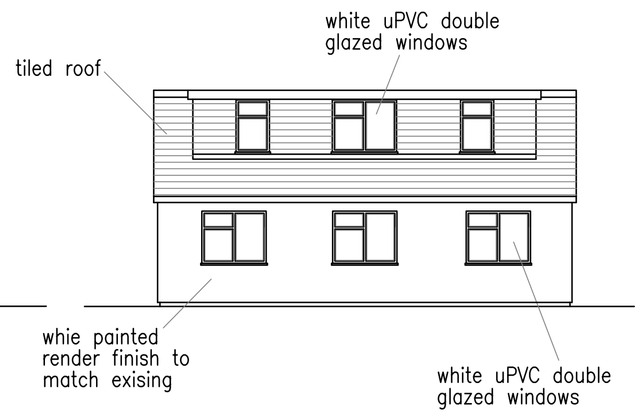
GROUND FLOOR PLAN
PROPOSED



Ⓓ FRONT ELEVATION



Ⓓ SIDE ELEVATION



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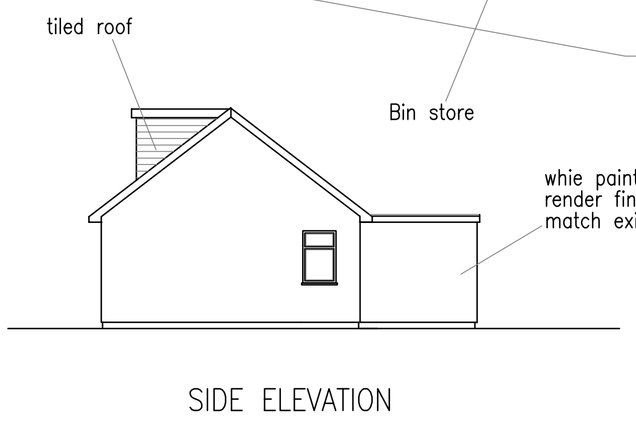

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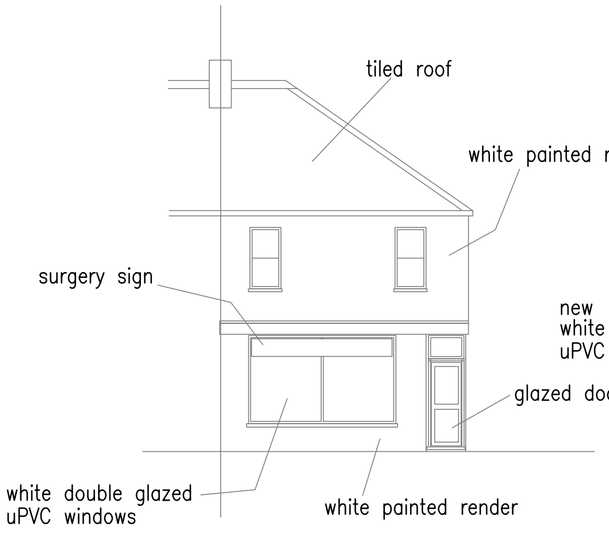
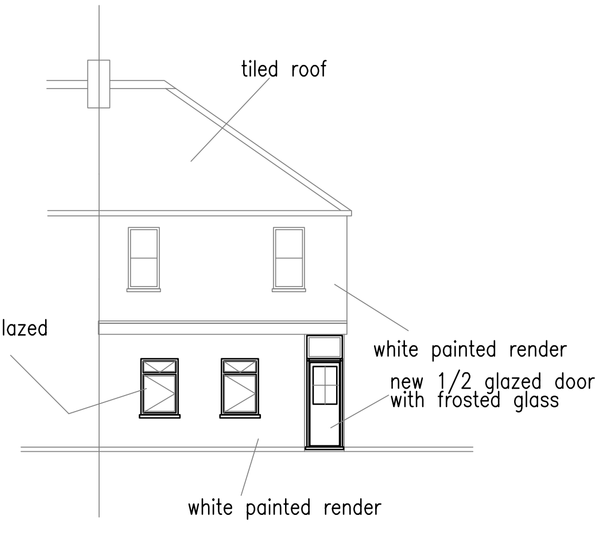


EXISTING FRONT ELEVATION



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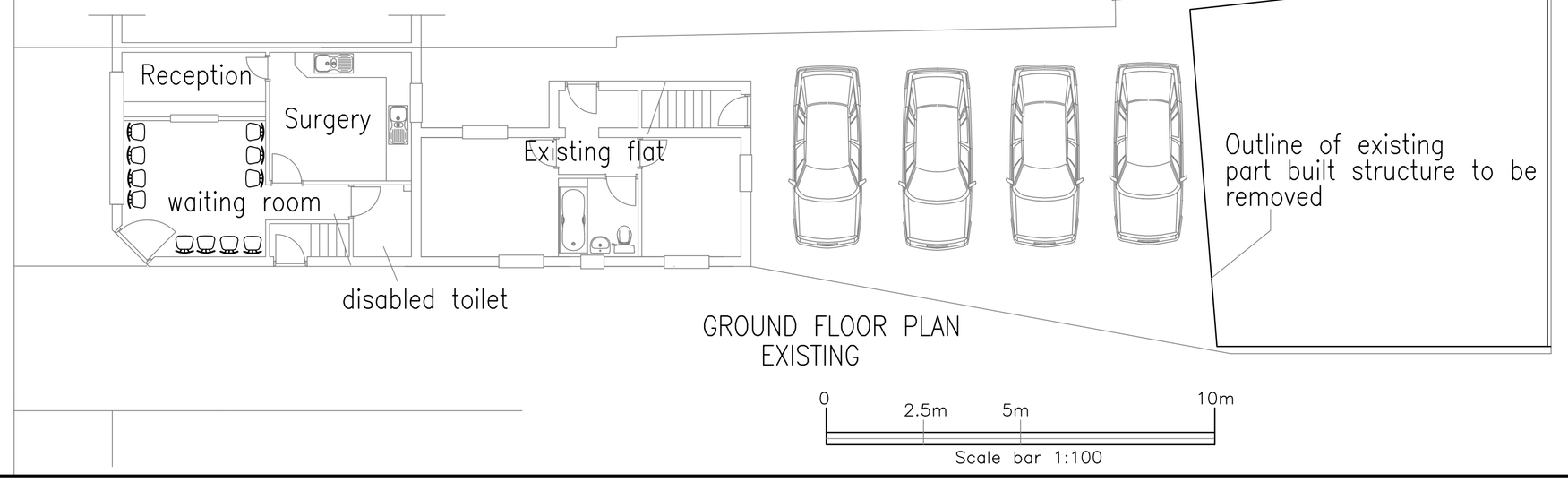


GROUND FLOOR PLAN
EXISTING

Ref.	Revision	Date	By
D	Revision shown Ⓓ	29/6/18	GDM
C	Revision shown Ⓒ	14/2/18	GDM
B	Revision to ground floor plan boundary line	22/11/17	GDM
A	Existing first floor added	8/11/17	GDM

Project

23 HIGH STREET
SWANSCOMBE KENT

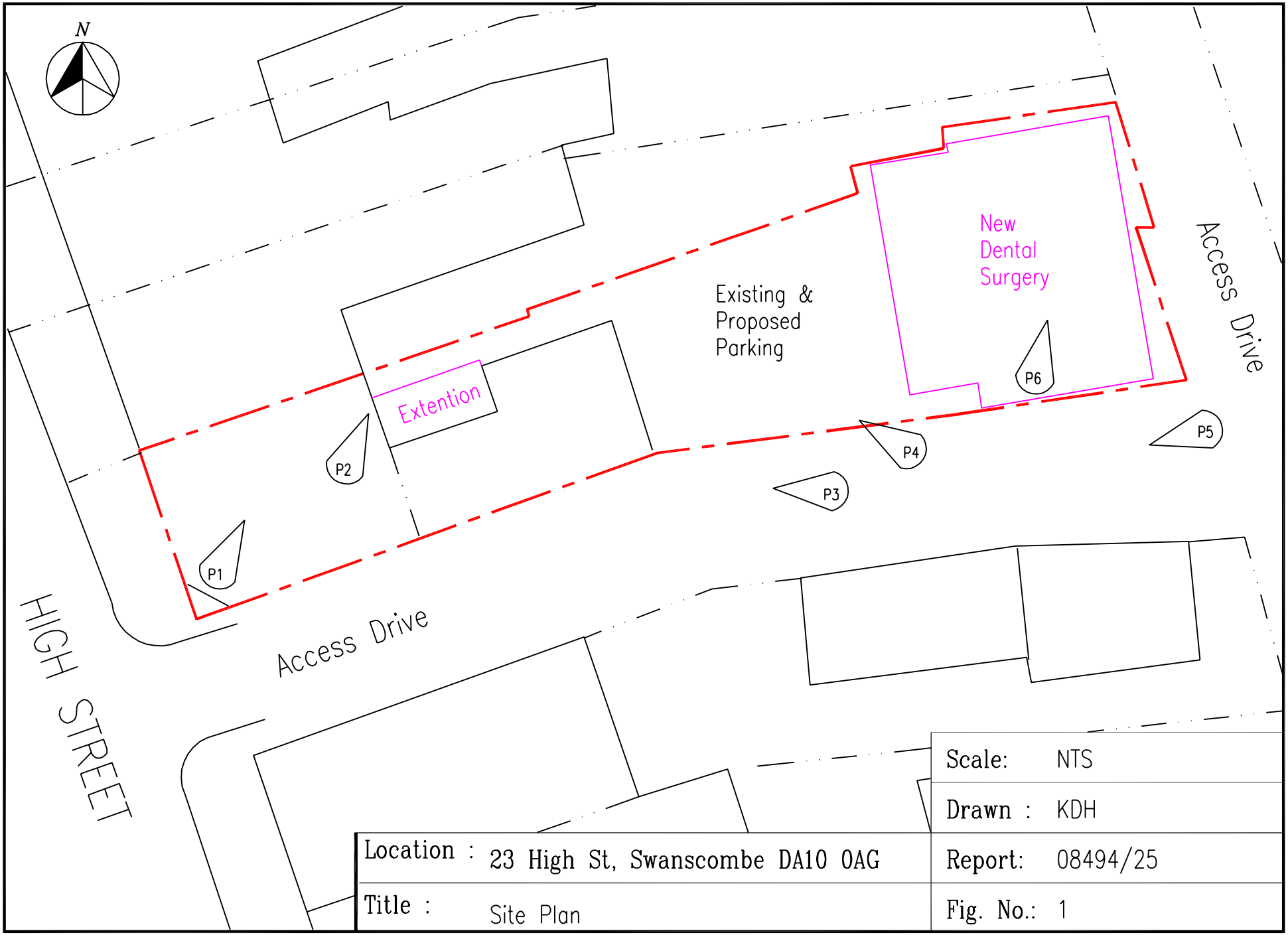
Drawing

PLANNING DRAWING

Scale 1:50 1:100		Date
Drawn By	GDM	29/7/17
Designed By		
Checked By		

Drawing number

SS/17/01 D



Location : 23 High St, Swanscombe DA10 0AG	Scale: NTS
	Drawn : KDH
	Report: 08494/25
Title : Site Plan	Fig. No.: 1

APPENDIX 2

AERIAL PHOTOGRAPHS

Enviro Insight

Address:	**23 High Street, Swanscombe, Kent, DA10 0AG**
Date:	**7 Mar 2019**
Reference:	**CMAPS-CM-783166-5500-070319EDR**
Client:	**CENTREMAPS**

NW N NE

W E

SW S SE

Aerial Photograph Capture date:	30-Jun-2015
Grid Reference:	560622,174687
Site Size:	0.0239ha

Report Reference: CMAPS-CM-783166-5500-070319EDR
Client Reference: 5500

All aerial photographs (1999 to 2018) courtesy of Google Earth

AERIAL PHOTOGRAPH 1 (1999)

AERIAL PHOTOGRAPH 2 (2003)

AERIAL PHOTOGRAPH 3 (2006)

AERIAL PHOTOGRAPH 4 (2007)

AERIAL PHOTOGRAPH 5 (2013)

AERIAL PHOTOGRAPH 6 (2018)

APPENDIX 3

SITE PHOTOGRAPHS

PHOTOGRAPH 1

Inside the existing dental surgery waiting area. This will be converted to a studio flat.

PHOTOGRAPH 2

Inside the existing dental surgery consulting room. This will be converted to a studio flat.

PHOTOGRAPH 3

Looking west at the existing building from the access drive.

PHOTOGRAPH 4

Looking northwest at the existing parking area from the access drive, which remain as the parking area.

PHOTOGRAPH 5

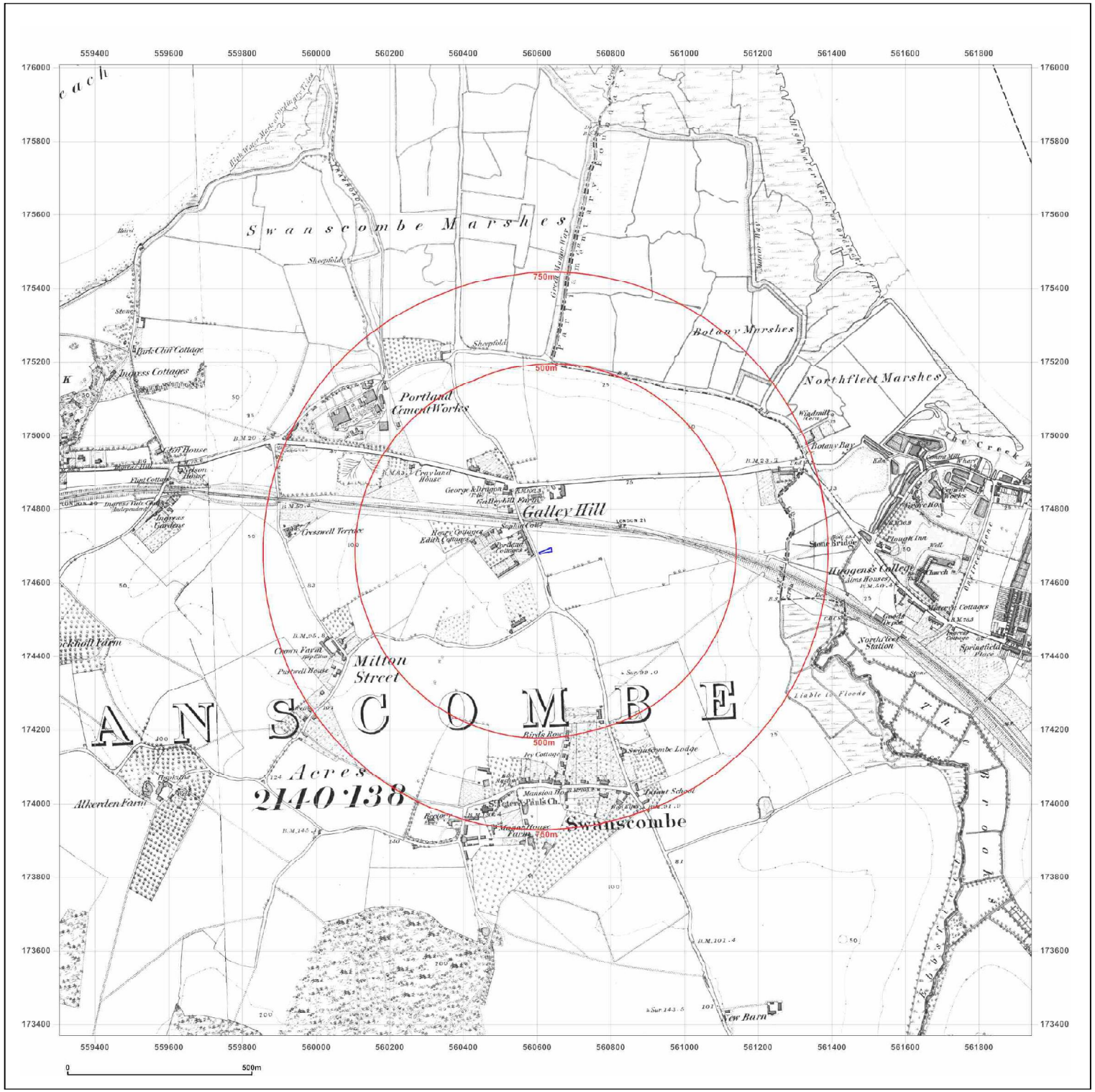
Looking west/southwest from the east boundary along the existing access drive adjacent to the south of site, which will remain as vehicle access off the High Street to the parking area.

PHOTOGRAPH 6

Looking northwest across the east area of the site that is occupied by the part built building, which will be demolished and replaced by the new dental surgery building.

APPENDIX 4

HISTORICAL MAPS



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

23 High Street, Swanscombe,
Kent, DA10 0AG

Client Ref: 5500
Report Ref: CMAPS-CM-783166-5500-070319HIS
Grid Ref: 560622, 174687

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Printed at: 1:10,560

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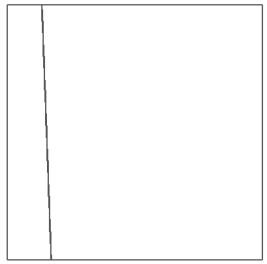

Surveyed 1866
Revised 1866
Edition N/A
Copyright N/A
Levelled N/A

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

Groundsure INSIGHTS

Produced by
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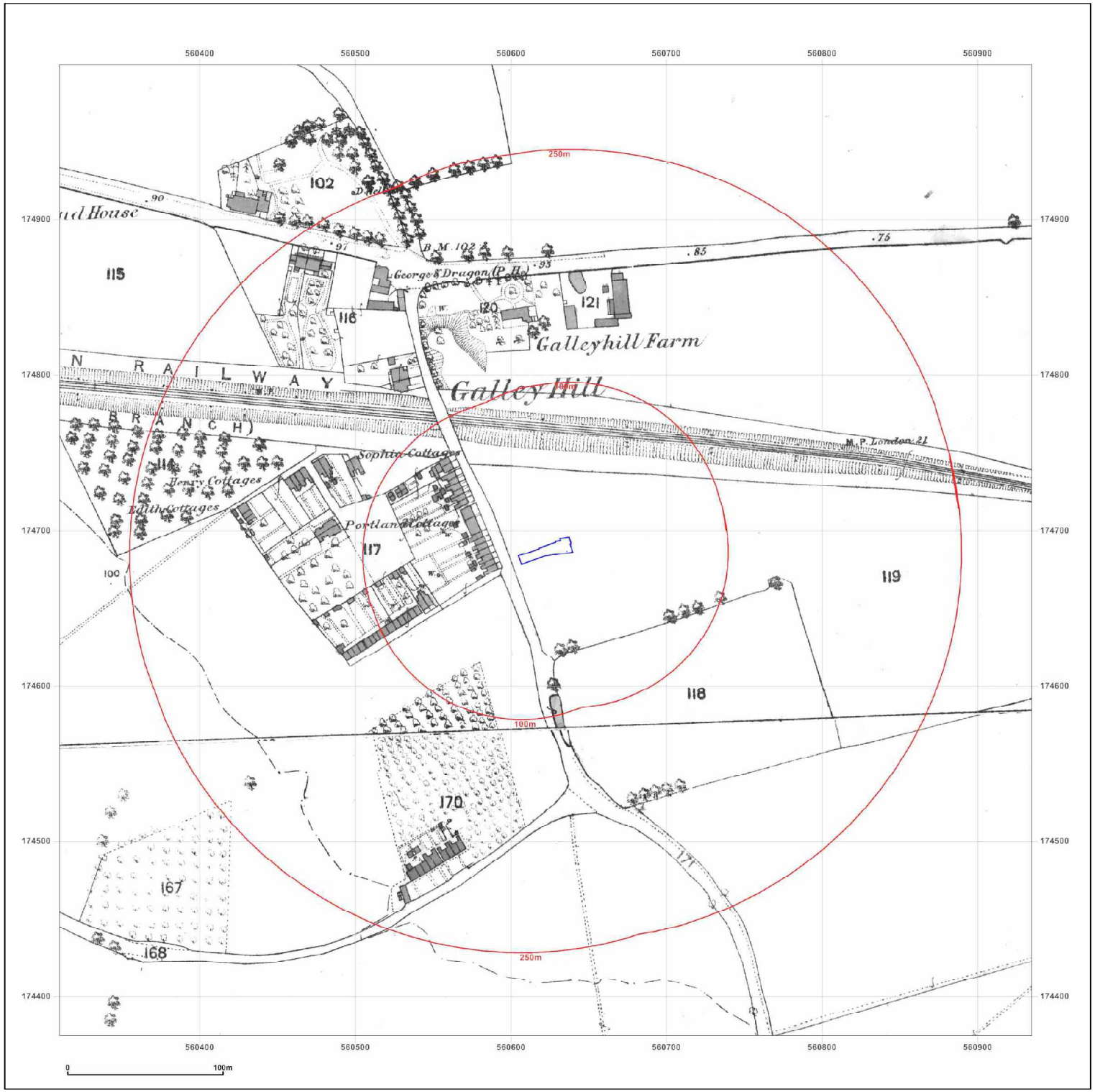
Supplied by:
www.centremapslive.com
groundsure@centremaps.com

Production date: 07 March 2019

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

23 High Street, Swanscombe,
Kent, DA10 0AG

Client Ref: 5500
Report Ref: CMAPS-CM-783166-5500-070319HIS
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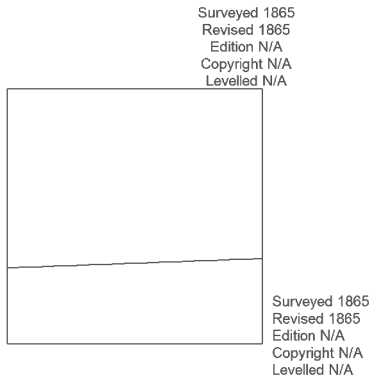

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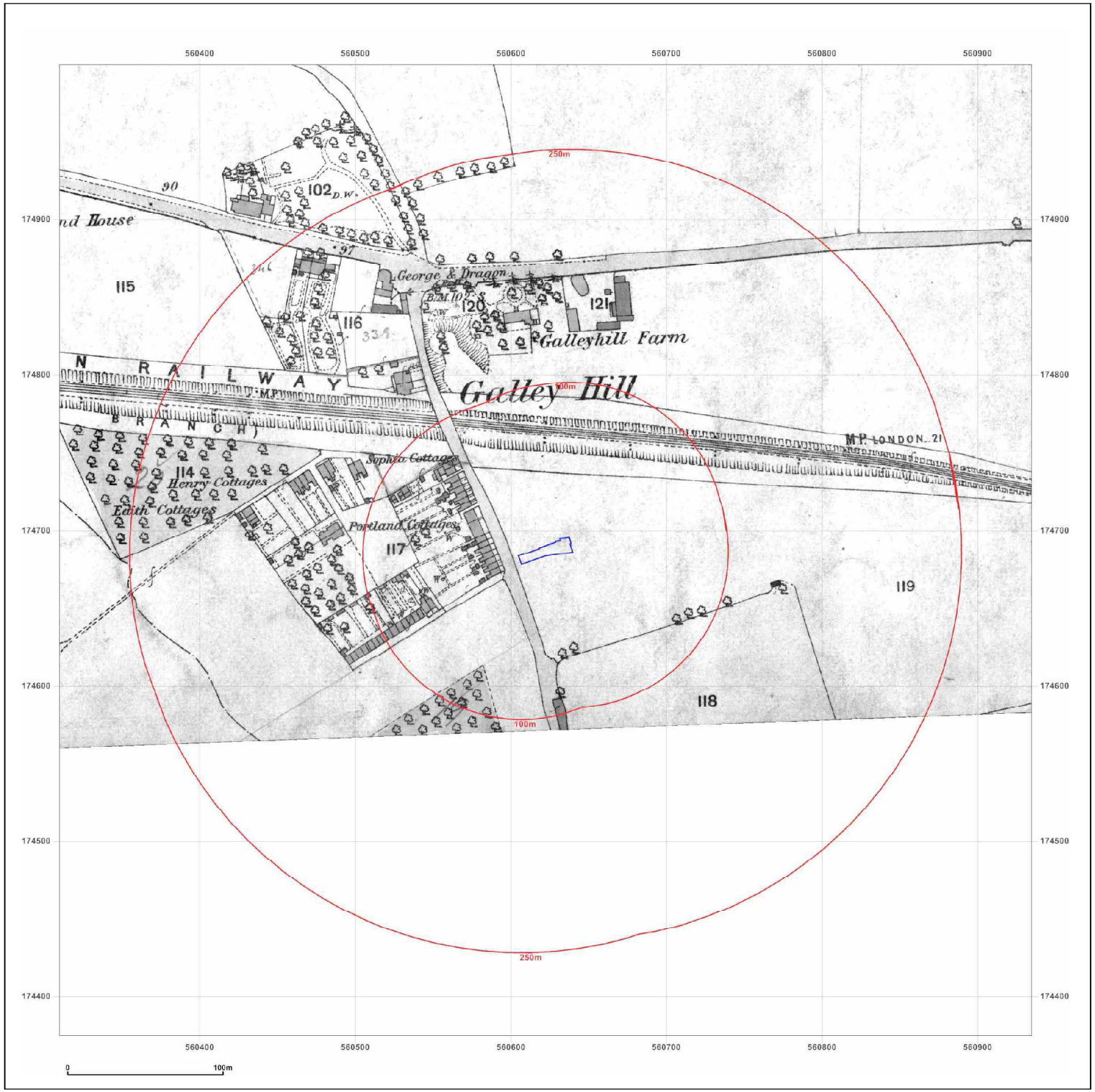
www.centremapslive.com
groundsure@centremaps.com

Production date: 07 March 2019

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

23 High Street, Swanscombe,
Kent, DA10 0AG

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Scale: 1:2,500
Printed at: 1:2,500

N
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Surveyed 1872
Revised 1872
Edition N/A
Copyright N/A
Levelled N/A

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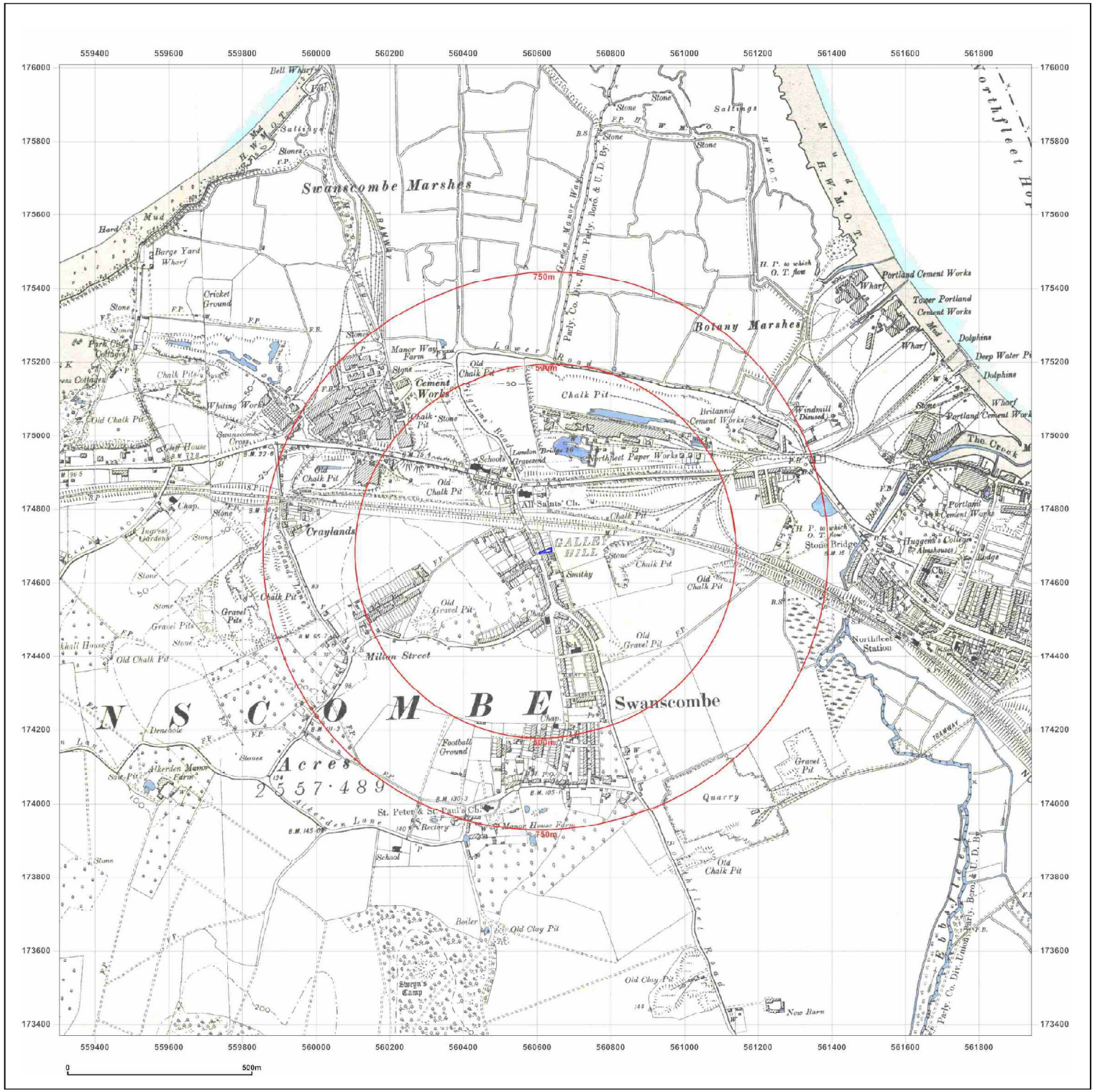
www.centremapslive.com
groundsure@centremaps.com

Production date: 07 March 2019

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

23 High Street, Swanscombe,
Kent, DA10 0AG

Client Ref: 5500
Report Ref: CMAPS-CM-783166-5500-070319HIS
Grid Ref: 560622, 174687

Map Name: County Series
Map date: 1895
Scale: 1:10,560
Printed at: 1:10,560

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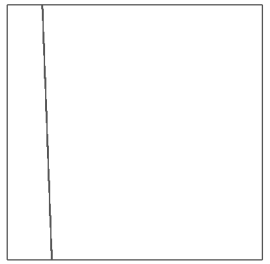

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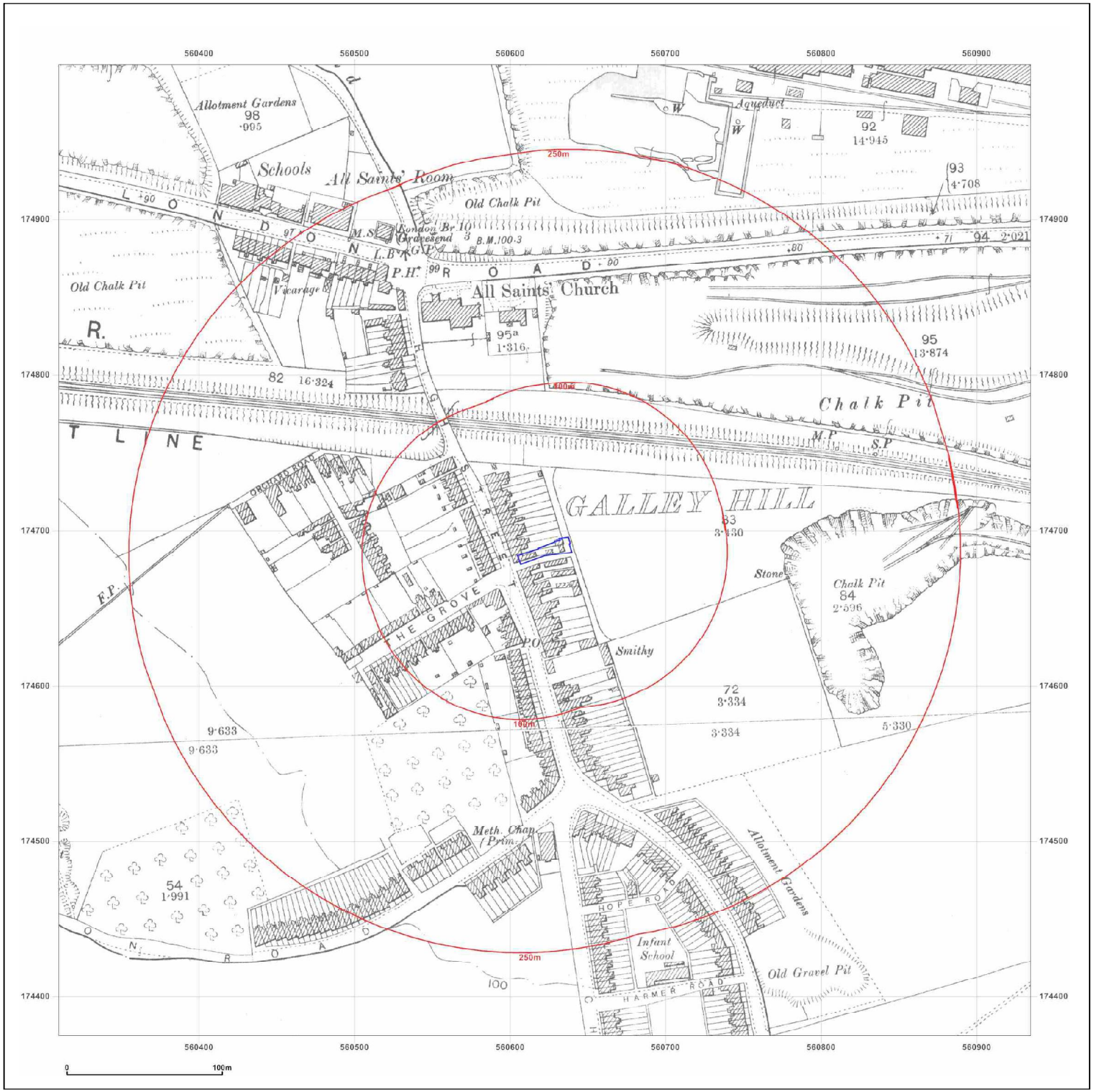

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FOR A BETTER POINT OF VIEW

Site Details:

23 High Street, Swanscombe,
Kent, DA10 0AG

Client Ref: 5500
Report Ref: CMAPS-CM-783166-5500-070319HIS
Grid Ref: 560622, 174687

Map Name: County Series
Map date: 1897
Scale: 1:2,500
Printed at: 1:2,500

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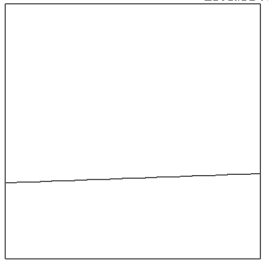
Surveyed 1897
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1897
Revised 1897
Edition N/A
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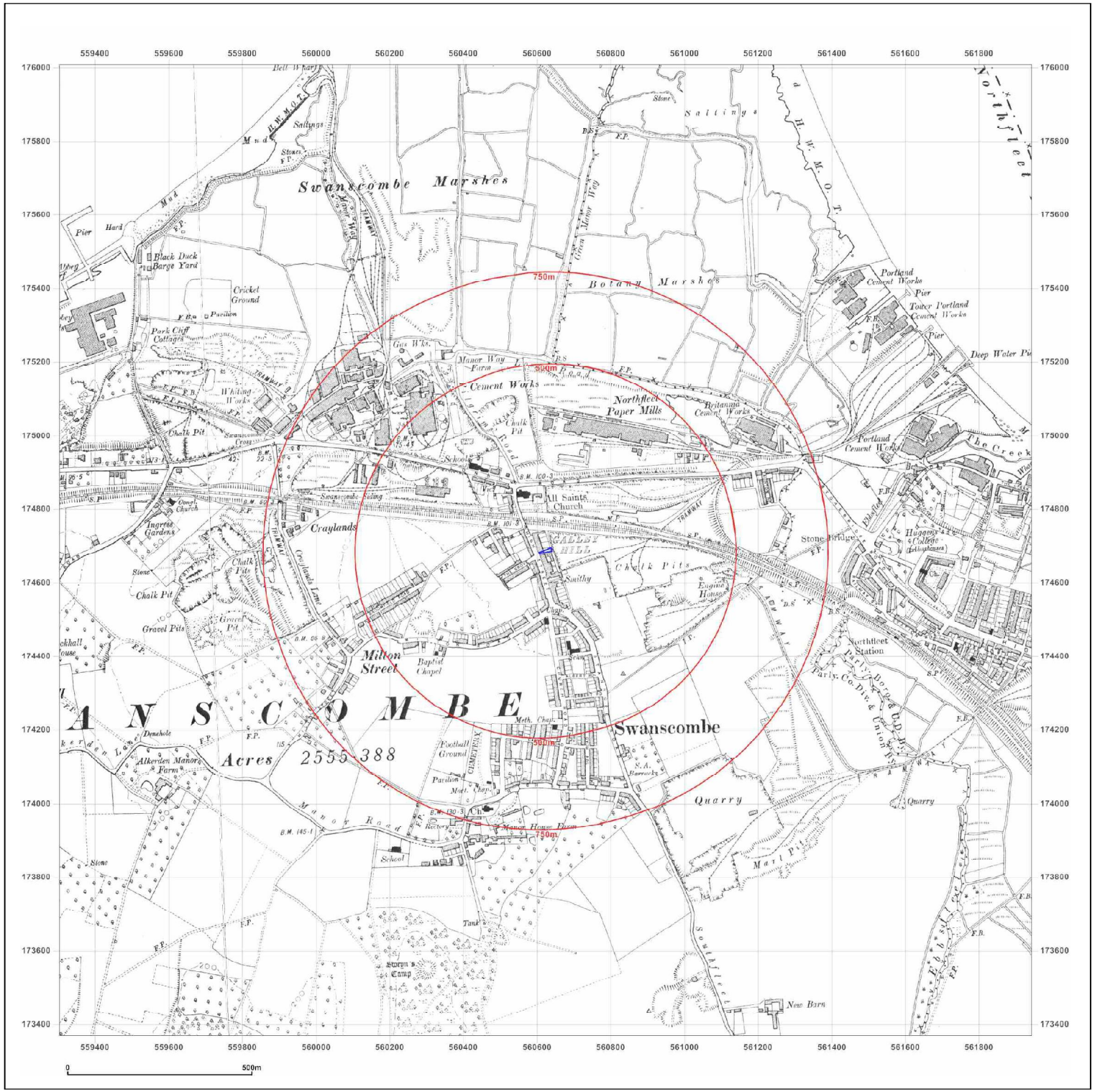

CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

23 High Street, Swanscombe,
Kent, DA10 0AG

Client Ref: 5500
Report Ref: CMAPS-CM-783166-5500-070319HIS
Grid Ref: 560622, 174687

Map Name: County Series
Map date: 1907
Scale: 1:10,560
Printed at: 1:10,560

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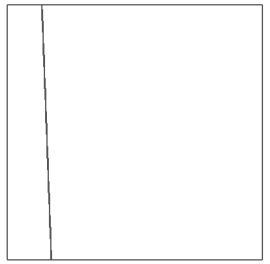

Surveyed 1864
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1864
Revised 1907
Edition N/A
Copyright N/A
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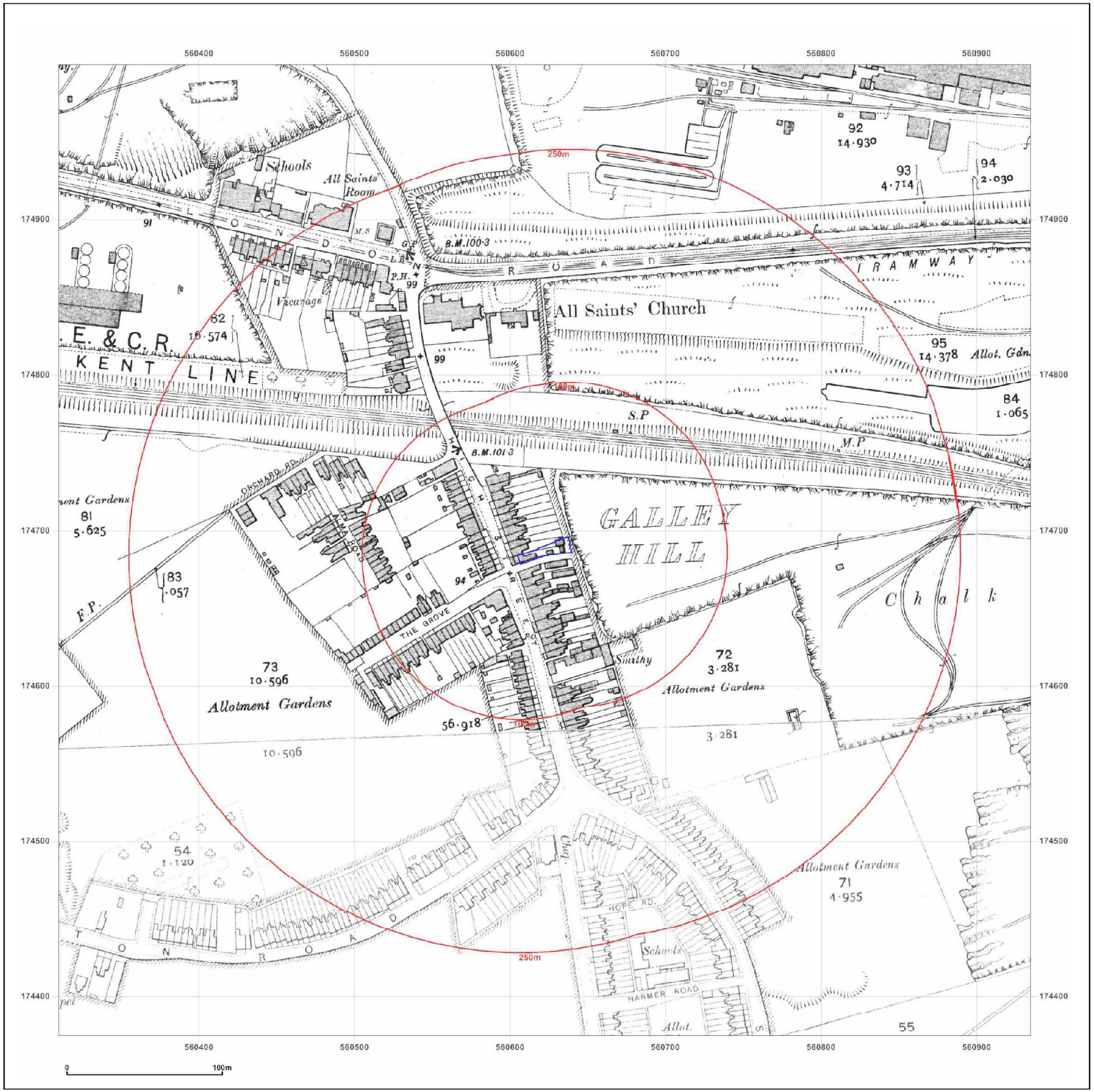

CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

23 High Street, Swanscombe,
Kent, DA10 0AG

Client Ref: 5500
Report Ref: CMAPS-CM-783166-5500-070319HIS
Grid Ref: 560622, 174687

Map Name: County Series
Map date: 1909
Scale: 1:2,500
Printed at: 1:2,500

N
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Surveyed 1864
Revised 1907
Edition 1909
Copyright N/A
Levelled N/A

Surveyed 1909
Revised 1909
Edition N/A
Copyright N/A
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Site Details:

23 High Street, Swanscombe,
Kent, DA10 0AG

Client Ref: 5500
Report Ref: CMAPS-CM-783166-5500-070319HIS
Grid Ref: 560622, 174687

Map Name: County Series
Map date: 1923
Scale: 1:10,560
Printed at: 1:10,560

N
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Surveyed 1864
Revised 1923
Edition N/A
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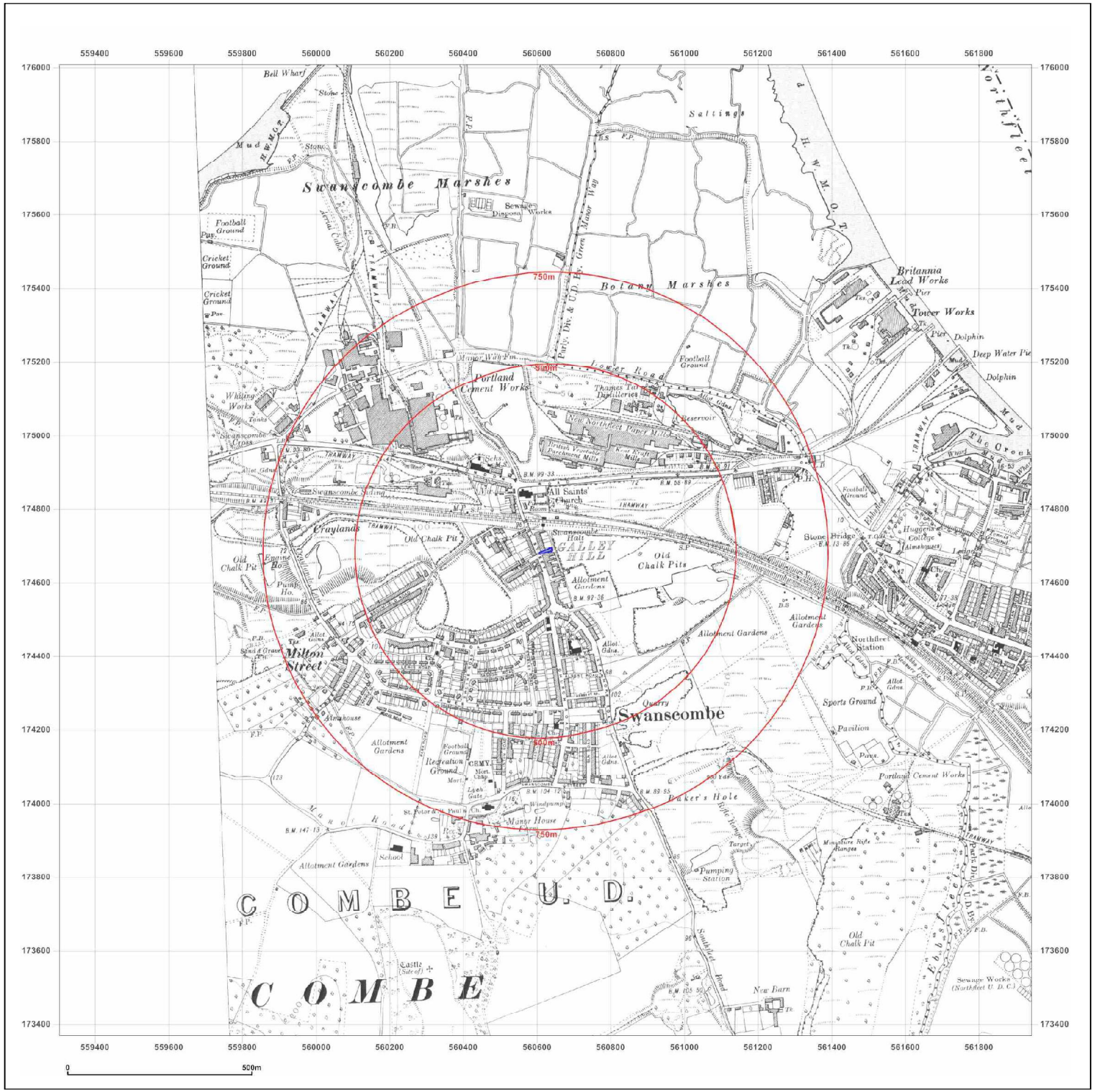

CENTRE MAPS LIVE.
FOR A BETTER POINT OF VIEW

Site Details:

23 High Street, Swanscombe,
Kent, DA10 0AG

Client Ref: 5500
Report Ref: CMAPS-CM-783166-5500-070319HIS
Grid Ref: 560622, 174687

Map Name: County Series
Map date: 1932
Scale: 1:10,560
Printed at: 1:10,560

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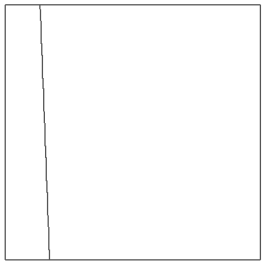

Surveyed 1864
Revised 1932
Edition N/A
Copyright N/A
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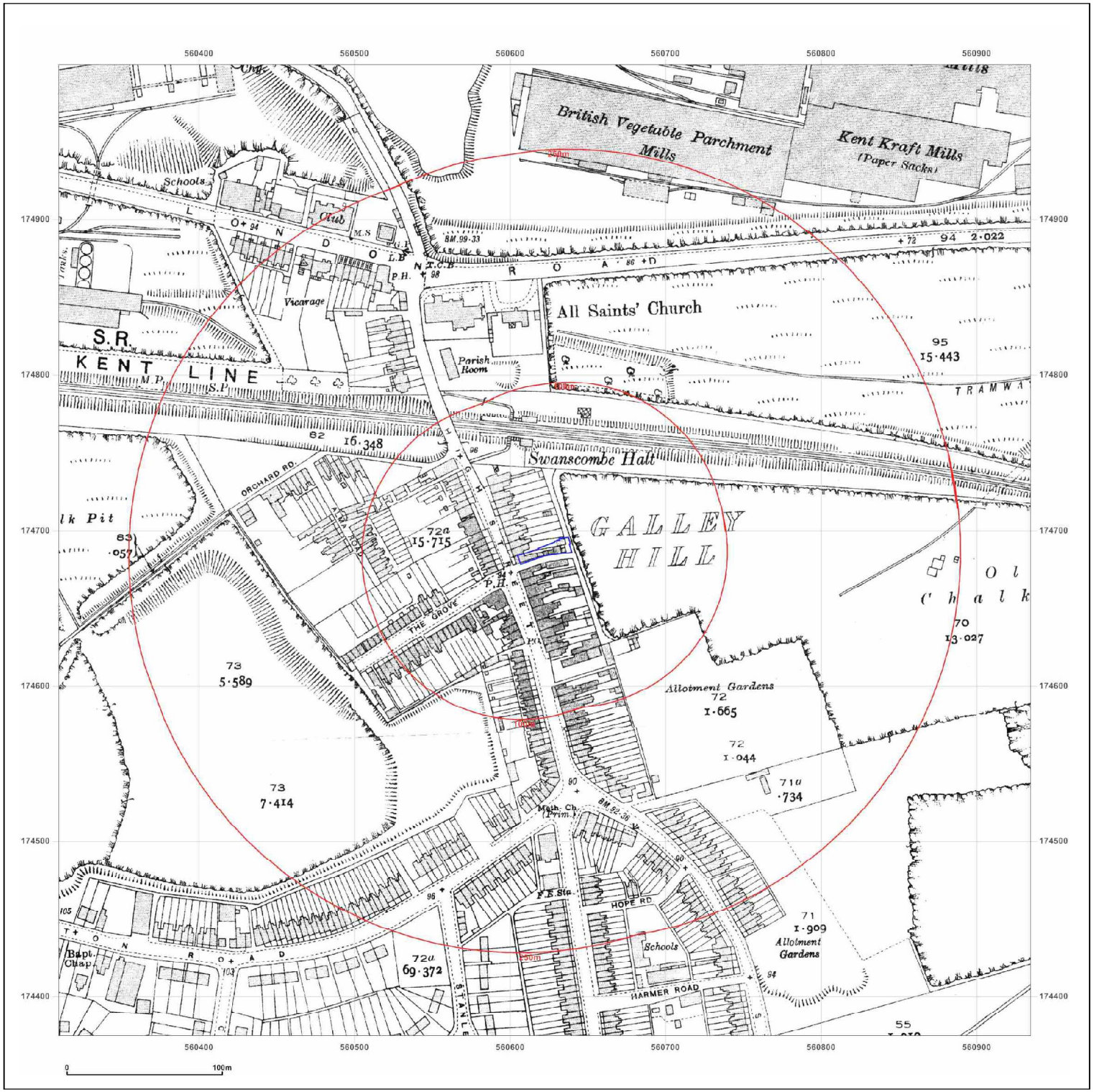

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Site Details:

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Kent, DA10 0AG

Client Ref: 5500
Report Ref: CMAPS-CM-783166-5500-070319HIS
Grid Ref: 560622, 174687

Map Name: County Series
Map date: 1932
Scale: 1:2,500
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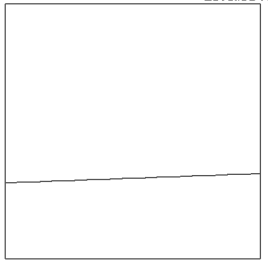
Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A



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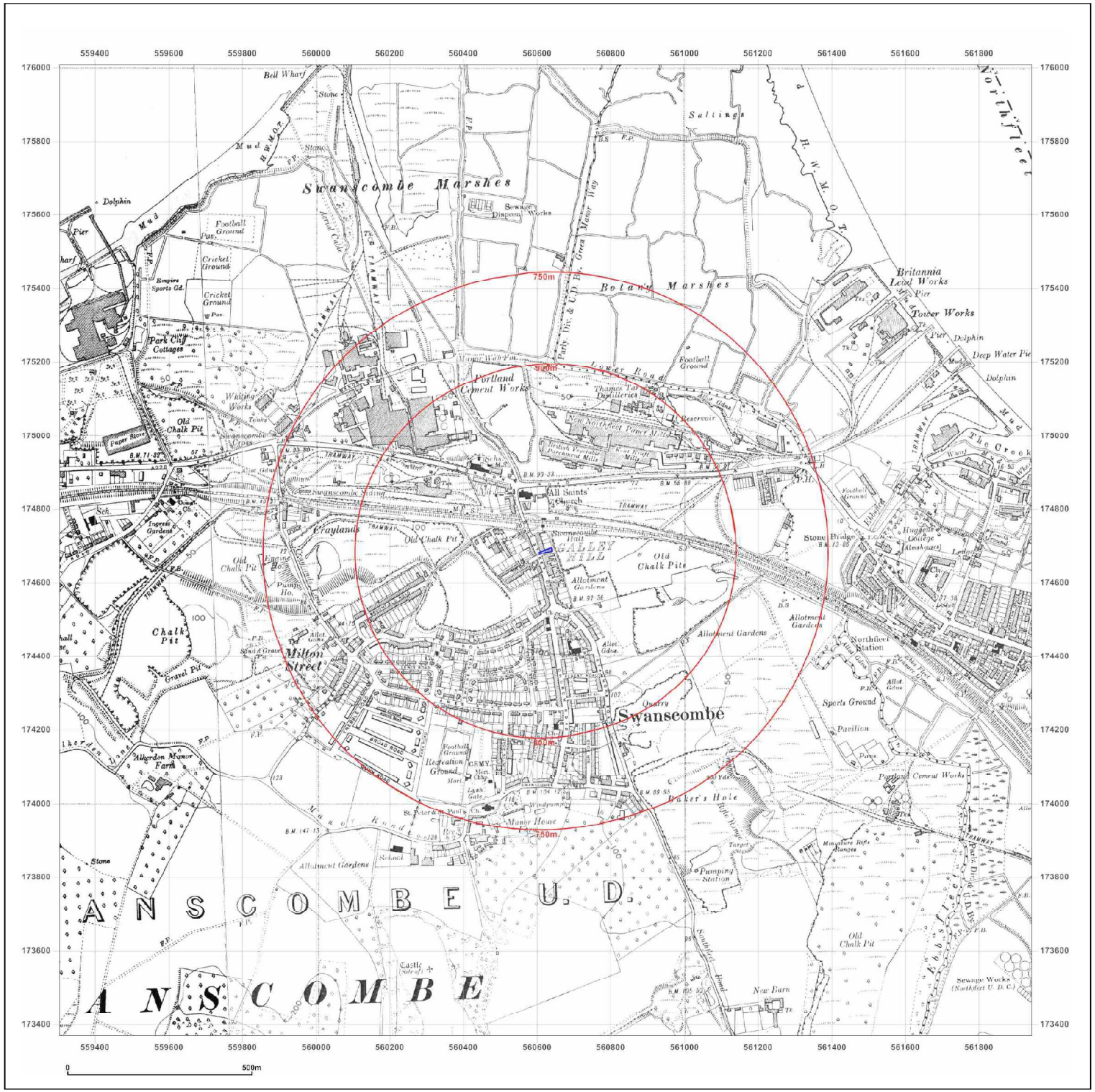

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Kent, DA10 0AG

Client Ref: 5500
Report Ref: CMAPS-CM-783166-5500-070319HIS
Grid Ref: 560622, 174687

Map Name: County Series
Map date: 1938
Scale: 1:10,560
Printed at: 1:10,560

N
W E
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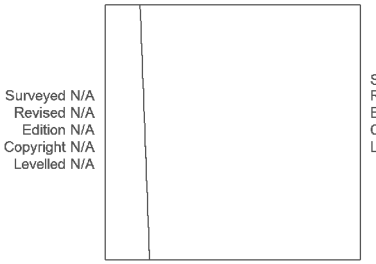

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