

R. CARR GEOTECHNICAL SERVICES

Ref: 4121/24

PROPOSED REDEVELOPMENT AT MID KENT GOLF CLUB, SINGLEWELL ROAD, GRAVESEND, KENT DA11 7RB.

PHASE I GEO ENVIRONMENTAL DESK STUDY AND PRELIMINARY RISK ASSESSMENT



February 2024

R. Carr Geotechnical Services, 9 The Mallows, Maidstone, Kent ME14 2PX

Tel: 07974 758617 Email: RONCARR200@aol.com

Contents

	Page
1. Introduction	1
2. Topography	1
3. Geology	1
4. Hydrology and Hydrogeology	2
5. Site History	2
6. Environmental Information Search	3
7. Site Inspection	5
8. Conceptual Site Model	5
9. Preliminary Risk Assessment	6
10. Discussion/Recommendations	9

Fig 1 Site location Plan

Plates 1- 4

Appendix A Site History

Appendix B Environmental Information Search

Mid Kent Golf Club, Singlewell Road, Gravesend, Kent DA11 7RB.

1. Introduction

- 1.1 This report has been prepared following receipt of instructions from Mr S. Barrow, representing the Mid Kent Golf Club, Singlewell Road, Gravesend.
- 1.2 The site is currently being considered for residential development. Plans for the proposed development have not been examined.
- 1.3 The purpose of this report is to identify and quantify contaminative and environment related issues which could affect the development, site workers and future users of the site.
- 1.4 This report provides a review of the history of the site and its surrounding area together with an environmental risk check and preliminary risk assessment in general compliance with the following guidelines:
- Land Contamination Risk Management (LCRM) Environment Agency (2020)
 - National Planning Policy Framework (NPPF) (2021)

2. Topography

- 2.1 The site is located on relatively level ground to the west of Singlewell Road (OS Land Ranger map reference TQ 646 724).

3. Geology

- 3.1 Reference to the local Geological Survey sheet (no. 271: Dartford) has indicated that the site is located upon the Seaford Chalk member of the White Chalk subgroup (formerly referred to as the Upper Chalk).
- 3.2 The Seaford Chalk consists of soft, white, friable limestone that is 95% calcium carbonate and contains seams of flints. The upper surface of the Chalk is often

deeply convoluted and may contain solution pipes filled with more recent deposits.

4. Hydrology and Hydrogeology

- 4.1 No surface water features have been identified within 500m of the site.
- 4.2 The Chalk is the Principal Aquifer of the area with high groundwater vulnerability. A Principal Aquifer is defined by the Environment Agency as a “highly permeable formation with known or possible presence of significant fracturing”. These tend to be highly productive and capable of supporting public supply and other abstractions.
- 4.3 Borehole records obtained from the Geological Survey indicate that groundwater does not occur within 10m of ground level in the local area.

5. Site History

- 5.1 A search has been undertaken of historical Ordnance Survey Maps provided by the Kent County Archives and Promap websites. The following maps have been examined for the presence of on and off-site contamination, extracts of which are contained in Appendix A:
- 5.2 OS map scale 1:2500 1869:
On site: The site is undeveloped, comprising open agricultural land located on the west side of a country lane referred to as Shinglewell Road.
Off site: The area immediately surrounding the site is also undeveloped, scattered residential properties being in evidence within 400m to the northwest. Gravesend town centre is located approximately 1.5 km to the north.
- 5.3 OS map scale 1:63660 1896:
On site: No significant change.
Off Site: No significant change.
- 5.4 OS map scale 1:63660 1912:
On site: No significant change.

Off site: Scattered residential development has occurred within 400m to the north of the site. Shinglewell Road is now referred to as Singlewell Road.

5.5 OS map scale 1:2500 1947:

On Site: No significant change.

Off Site: Extensive residential development has extended south to within 100m from the north end of the site and within 200m to the east. A golf course is denoted within 100m to the south of the site, a building being in evidence within 150m on the west side of Singlewell Road.

5.6 OS map scale 1:2500 1955:

On site: The site now comprises the east end of an area of allotment gardens.

Off site: Additional allotment gardens are in evidence within 200m to the southwest of the site. A golf club house is denoted on the east side of Singlewell Road, within 50m to the northeast.

5.7 OS map scale 1:10000 1980-1982:

On site: The footprint of the site is now denoted.

Off Site: The existing golf club house has been constructed within 25m to the south of the site. Allotment gardens are no longer in evidence, land to the south of the site now being denoted as the Mid Kent Golf Course.

6. Environmental Information Search

6.1 A search of environmental information has been carried out for the site by Landmark Information Group, who provide a database of environmental data. A summary of relevant information is provided as follows, full details of which are contained in Appendix B:

6.2 **Potentially Contaminative Industrial Uses (Past Land Use)**

Electrical Substation Facilities: 1986	177mS
Electrical Substation Facilities: 1972	175mS
Electrical Substation Facilities: 1972	191mE

Electrical Substation Facilities: 1951	205mE
Electrical Substation Facilities: 1986	227mN
Electrical Substation Facilities: 1972	250mNW

6.3 Potentially Infilled Land

None identified within 250m of the site.

6.4 Landfill and Waste

None identified within 250m of the site.

6.5 Local Authority Pollution Prevention & Controls

None identified within 250m of the site.

6.6 Contemporary Trade Directory Entries

Concrete Pumping (Active)	98mSE
Joinery Manufacturers (Inactive)	129mNW
Waste Disposal Services (Inactive)	173mNW
Blinds, Awnings & Canopies (Inactive)	228mNE
French Polishing (Active)	231mN

6.7 Flooding

A risk of flooding has not been identified to the site.

6.8 Energy & Infrastructure Screen

The site is located within 4km of existing or proposed wind farms or wind turbines and within 2km of existing or proposed solar farms.

6.9 Radon

Intermediate Probability	No radon protection measures necessary within development
-----------------------------	--

6.10 Environmental Constraints

None identified within 250m of the site.

7. Site Inspection

- 7.1 An inspection of the site was undertaken on 25th February 2024 during inclement weather conditions with intermittent showers and sunny periods.
- 7.2 The site was situated within a residential area to the south of Gravesend town centre. Semi-detached and detached dwellings of early to late twentieth century appearance were present in the surrounding area, a club house and associated golf course being situated to the south of the site.
- 7.3 The site comprised a relatively small area of worn tarmac surfacing which currently functions as a car park for the golf club (Plates 1-4). Two vehicles were parked on the car park at the time of the inspection.
- 7.4 An elliptical area of granular surfacing supporting a row of ornamental horticultural tubs extended across the south end of the site, the north, east and west sides of the site comprising mown grass. Ornamental trees and shrubs were situated on the east and west sides of the site.
- 7.5 The public footpath along Singlewell Road formed the east boundary of the site, tarmac surfacing comprising the main entrance into the golf club from Singlewell Road extending alongside the site's south end. Additional vehicular parking for the golf club was situated beyond the west boundary of the site. The side elevation of a semi-detached dwelling and its associated garden fences formed the north boundary of the site.
- 7.6 No visual or olfactory evidence of contamination was observed on or around the site during the course of the inspection.

8. Conceptual Site Model

- 8.1 Based upon the available information the site would appear to have comprised undeveloped land until it was included within an area of allotment gardens around the middle part of the twentieth century. By the 1980's the site had been converted

into a small car park around the time the adjacent golf club house was constructed. At the time of the site inspection vegetation present around the site perimeter appeared to be in healthy condition. The site is underlain by a Principal Aquifer. A potential risk of flooding has not been identified to the site or within its surrounding area. A low to moderate risk to receptors including human health, plant life and underground polyethylene water services has been identified from the following potential sources of contamination:

- Metals, polyaromatic hydrocarbons (PAH) and petroleum hydrocarbons (TPH) possibly present within sub-base material beneath the site surfacing
- Possible localised TPH contamination as a result of fuel and lubricant leakages from parked vehicles

8.2 A low risk has been identified to the water environment as any potential contamination is likely to be superficial and groundwater is not anticipated to occur for some considerable depth. No surface waterbodies have been identified within 500m of the site.

8.3 Historic electricity substation facilities and more recent commercial activities identified within the area surrounding the site are considered sufficiently remote to present a significant risk to the site. A low risk has therefore been identified from off-site sources of potential contamination.

8.4 No areas of landfill or infilled ground have been identified within 250m of the site. The topography of the site does not indicate the presence of excessive quantities of made ground beneath the site surface and no radon protection measures are reported to be necessary by the Landmark report within the proposed development. The risk to the site from both on and off-site emissions of ground gas is therefore considered to be low.

9. Preliminary Risk Assessment

9.1 A preliminary risk assessment has been defined utilising the available information. The risk from possible sources of contamination to receptors including the public,

workers, future users and environment has been analysed using the Source – Pathway – Receptor model approach. The main receptors considered in the following assessment are:

- Future users
- Occupants of surrounding buildings and livestock
- Groundwater and associated abstractions
- Site workers
- Building fabric
- Plants

Source	Hazard	Receptor	Pathway	Severity of impact	Risk	Action required to clarify and define mitigation, if necessary
Organic contaminants associated with fuel leakages and made ground e.g. TPH, PAH,	Toxic and carcinogenic	Future Users	Inhalation, ingestion and skin contact	Serious	Low to moderate	Limited testing of soil samples during the course of ground workings. Removal of contaminated soil, if necessary.
		Adjoining site occupiers	Ditto	Negligible	Low	Minimise dust, avoid spillages.
	Attack on plastic or rubber	Site workers	Ditto	Serious	Low	Provision of protective clothing and equipment during construction work.
		Groundwater Drains & surface water	Leaching, permeable strata, drainage	Serious	Low	Appropriate precautions with storage of fuel and lubricants during construction work.
Inorganic contaminants associated with made ground e.g. arsenic, lead, etc.	Attack on plastic or rubber	Building Services and Fabric	Leaching and diffusion	Serious	Low to moderate	Limited testing of soil samples during the course of ground workings. Consult local water authority if in doubt over suitability of materials.
		Future users	Inhalation, ingestion and skin contact	Serious	Low to moderate	Limited testing of soil samples during the course of ground workings. Removal of contaminated soil, if necessary.
	Zootoxic	Local residents	Ditto	Moderate	Low	Minimise dust where possible
		Site Workers	Ditto	Moderate	Low	Provision of protective clothing/equipment. Minimise dust.
	Zootoxic	Groundwater	Leaching, permeable strata, groundwater	Serious	Low	Precautions within the design of surface water drainage in areas of vehicular parking.
		Plants	Uptake	Serious	Low to moderate	Limited testing of soil samples in proposed garden areas and replacement with clean topsoil if contamination detected.
Phytotoxic metals e.g. copper, zinc.	Phytotoxic	Groundwater	Leaching, permeable strata, groundwater	Serious	Low	Precautions within the design of surface water drainage in areas of vehicular parking.
Asbestos	Carcinogenic and Respiratory Irritant	Future Users	Air inhalation	Serious	Low	No evidence of demolished buildings on site. Removal by experienced contractor if discovered on site.
		Adjoining site occupiers	Ditto		Low	
		Site workers				
Ground gases e.g. methane, carbon dioxide.	Asphyxiant, explosive	Future Users	Service ducts	Serious	Low	No credible sources of gas migration identified within 250m of the site. Radon protection unnecessary. Excessive made ground not indicated by site topography.
		Adjoining site occupiers	Air inhalation			

10. Discussion/Recommendations

10.1 Part IIA of the Environment Protection Act 1990 defines contaminated land as: “any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land that:-

- a) significant harm is being caused or there is a significant possibility of such harm being caused, or;
- b) pollution of controlled waters is being, or is likely to be, caused

“Harm” means harm to the health of living organisms or other interference with the ecological systems of which they form part, and in the case of man, includes harm to his property.

10.2 There are two steps in applying the definition of contaminated land:

- 1) Identification of a “contaminant”, a “pathway” (or pathways) and a “receptor” with respect to the land in question.
- 2) Identification of a pollutant linkage and that the pollutant linkage:
 - a) is resulting in significant harm being caused to the receptor in the pollutant linkage.
 - b) presents a significant possibility of significant harm being caused to that receptor.
 - c) Is resulting in the pollution of controlled waters
 - d) Is likely to result in such pollution.

10.3 Under the Groundwater Regulations Act 1998, it is an offence to allow List I substances to enter groundwater. It is also an offence to allow List II substances to enter groundwater without prior consultation with the local authority.

10.4 Based upon the information currently available, the site is considered to pose a low to moderate risk to human health, plant life and subterranean polyethylene water supply pipes. It is therefore recommended that a limited regime of chemical laboratory testing is undertaken on near-surface soil samples obtained during the course of ground workings for the development. The samples should be tested for a suite of common contaminants including metals, speciated polyaromatic

hydrocarbons (PAH) and petroleum hydrocarbon fractions (TPH/CWG). Proposed areas of garden within the development should be specifically targeted by the sampling.

- 10.5 Every precaution should be taken during the course of the development in order to prevent the escape and subsequent migration of pollutants into the underlying Principal Aquifer. Any fuel and/or lubricants utilised by contractors' plant during the course of the development should be stored in a secure, preferably bunded area of the site.
- 10.6 In the event that contamination not detected by the Desk Study is encountered on the site during the course of the development, the nature of the contamination should be adequately assessed and dealt with in an appropriate manner. Evidence of contamination may include discoloured or malodorous soil and the presence of ash, clinker or asbestos. If any contamination is discovered, works should cease and an appropriate remediation strategy implemented.
- 10.7 This report should be made available to the Contaminated Land Officer of the Local Planning Authority for due consideration prior to the commencement of the development.



R. Carr BA (Hons) FGS

February 2024



**Mid Kent Golf Club, Singlewell Road, Gravesend.
Fig 1. Location Plan of Site.**



Plate 1



Plate 2



Plate 3



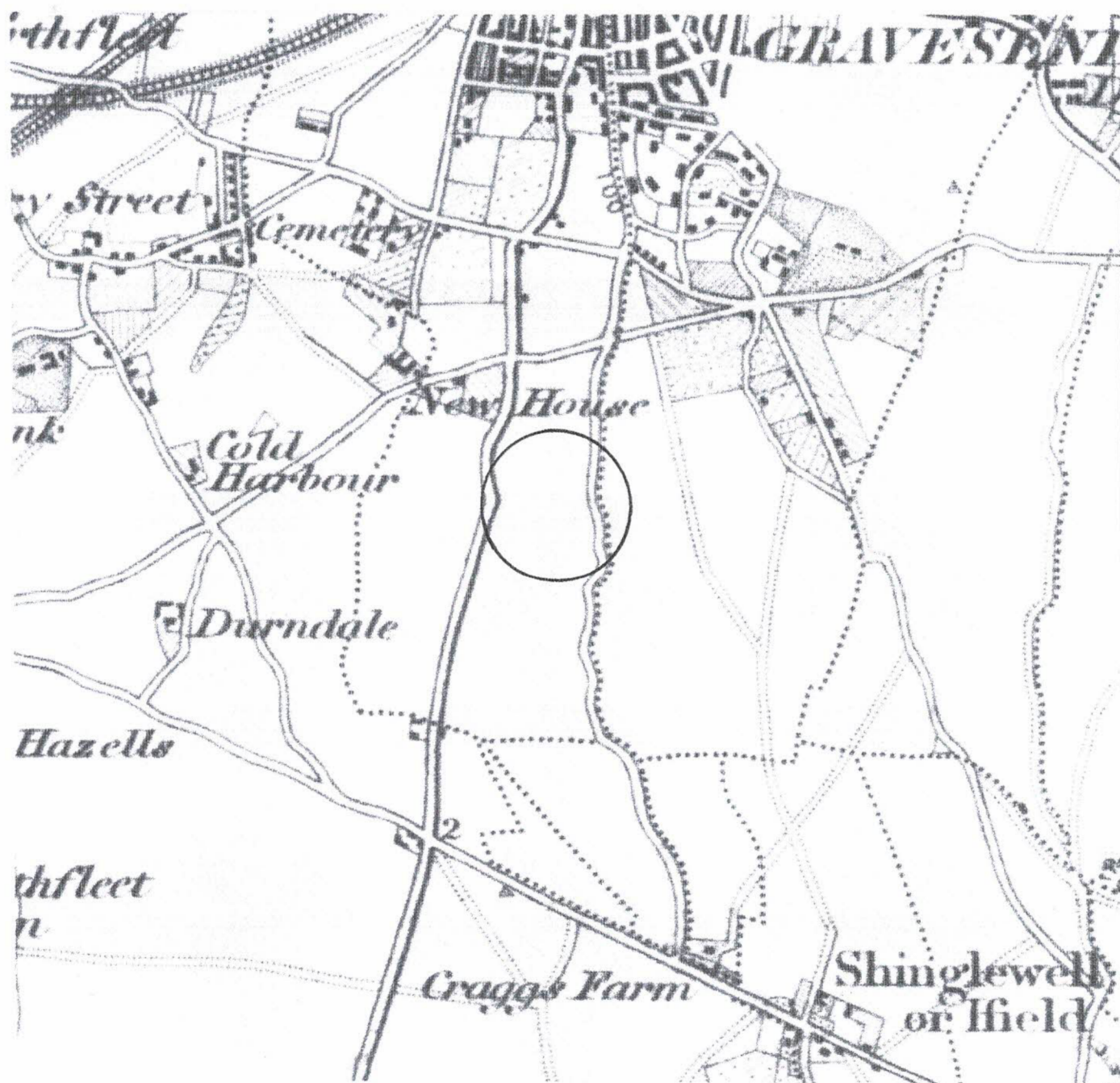
Plate 4

Appendix A

Site History



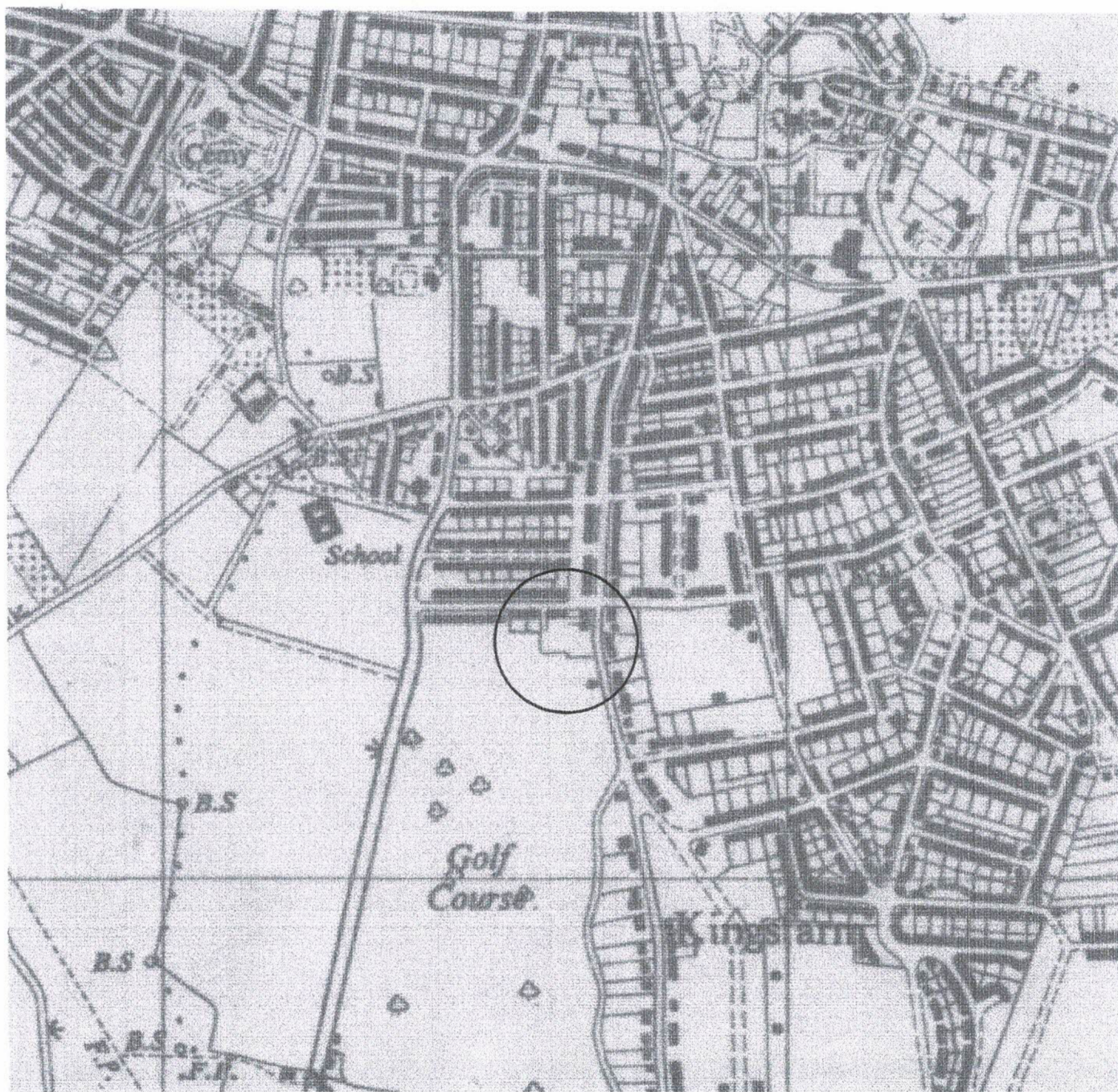
Mid Kent Golf Club, Singlewell Road, Gravesend.
OS map scale 1:2500: 1869.



Mid Kent Golf Club, Singlewell Road, Gravesend.
OS map scale 1:63360: 1896.



Mid Kent Golf Club, Singlewell Road, Gravesend.
OS map scale 1:63360: 1912.



**Mid Kent Golf Club, Singlewell Road, Gravesend.
OS map scale 1:2500: 1948.**





**Mid Kent Golf Club, Singlewell Road, Gravesend.
OS map scale 1:10000: 1980-1982.**