

R. CARR GEOTECHNICAL SERVICES

Ref: 3962/22

**PROPOSED REDEVELOPMENT AT
UNIT K6, LOWER ROAD, NORTHFLEET,
KENT DA11 9BL.**

**PHASE I GEO ENVIRONMENTAL DESK STUDY
AND PRELIMINARY RISK ASSESSMENT**



March 2022

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Fig 1 Plan of Proposed Development

Plates 1- 6

Appendix A Site History

Appendix B Environmental Information Search

Unit K6 Lower Road, Northfleet, Kent DA11 9BL.

1. Introduction

- 1.1 This report has been prepared following receipt of instructions from Mr P Rudd representing Jacksons Lifts Ltd, prospective developers of the site at Unit K6, Lower Road, Northfleet.
- 1.2 The proposed development comprises the addition of upper storeys to the existing commercial unit, together with the construction of a rear, multi-storey car park (Fig 1).
- 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 northeast of Lower Road (OS Land Ranger map reference TQ 613 751).

3. Geology

- 3.1 Reference to the local Geological Survey sheet (no. 271: Dartford) has indicated that the site is located upon an area of Alluvium, underlain by the Seaford Chalk member of the White Chalk subgroup (formerly referred to as the Upper Chalk).

- 3.2 Alluvial deposits comprise fine-grained sediments of geologically recent origin. Occupying river valleys and coastal flats, the deposits are characterised by a high moisture content and may contain layers of compressible peat.
- 3.3 The White Chalk consists of soft, white, friable limestone that is 95% calcium carbonate and contains scattered nodular and tabular flint. 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 A surface watercourse is located approximately 100m to the northwest of the site. The Thames Estuary is situated within 300m to the northeast.
- 4.2 Subject to its constituents, the Alluvium is usually classified as a Non Aquifer. Such formations are generally regarded as containing insignificant quantities of groundwater.
- 4.3 The Chalk is the Principal Aquifer of the area. 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. Soil Classification: Soils of High Leaching Potential (U).

5. Site History

- 5.1 A search has been undertaken of historical Ordnance Survey Maps obtained from the Kent County Council Archives and Landmark websites. The following maps have been examined for the presence of potential 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 comprises undeveloped land located within an area of estuarine

marshes. A drainage ditch passes roughly west to east across the site, discharging into a meandering surface watercourse to the north.

Off site: A corn windmill and an associated building are located adjacent to the northwest corner of the site. An additional surface watercourse is present within 10m to the northwest. Kilns are denoted within 100m to the south and southeast, a quarry also being in evidence within 100m to the southwest. Cement Works are located within 200m to the southeast of the site.

5.3 OS map scale 1:2500 1898:

On site: Tramways have been installed within the local area and appear to cross the southeast corner of the site.

Off site: An additional building has been constructed next to the windmill, though the windmill is now disused. Additional cement works and associated tramways have been installed within 200m to the west of the site and within 400m to the northeast, a quarry associated with the former cement works being located within 250m to the west. A flooded quarry is in evidence within 200m to the southwest. Wharfs have been installed alongside the estuary to the northeast. The quarry to the south is no longer denoted.

5.4 OS map scale 1:2500 1910:

On site: No significant change.

Off site: The windmill has been demolished, though the pair of adjacent buildings remain. The flooded quarry to the southwest has been infilled. Northfleet Paper Mills have been established within 300m to the west of the site.

5.5 OS map scale 1:2500 1934:

On site: No significant change.

Off site: The quarry to the west is now referred to as a reservoir. The Britannia Lead Works are denoted within 400m to the northeast of the site.

5.6 OS map scale 1:2500 1929-1952:

On site: No significant change.

Off site: Allotment gardens are denoted within 25m to the west of the site.

5.7 OS map scale 1:10560: 1961-1962:

On site: The drainage ditch is no longer in evidence on the site.

Off site: A pipeline passing roughly southwest to northeast has been installed within 25m to the north of the site and a football ground has been constructed within 150m to the south.

5.8 OS map scale 1:10000: 1991-1993:

On site: A large building incorporating the existing unit is now present on the site, extending across the former allotments to the west.

Off site: The tramways have been removed and the surrounding area extensively developed with buildings of commercial appearance. Depots are denoted within 100m to the south and southeast. Works are also located within 200m to the southeast. The football ground remains to the south.

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)

Factory or Works: 1991	On Site
Road Haulage: 1991	27mSE
Factory or Works: 1946	34mE
Factory or Works: 1961-1991	95mW
Factory or Works: 1962-1991	106mSW
Factory or Works: 1991	145mSE
Factory or Works: 1961	196mN
Metal casting/foundries: 1946	212mN
Factory or Works: 1991	222mSE

6.3 Historical Tanks & Energy Facilities

Tanks: 1973	54mSE
Electrical Substation Facilities: 1973	76mW
Electrical Industry Facilities: 1973	55mW
Electrical Substation Facilities: 1953	71mW
Electrical Substation Facilities: 1954	70mW
Tanks: 1970	171mE
Tanks: 1971	174mE
Tanks: 1953	187mNE
Tanks: 1971	232mE
Tanks: 1953	234mW
Tanks: 1954	234mW
Tanks: 1971	237mNE
Tanks: 1971	238mE

6.4 Potentially Infilled Land (Non water)

Unknown Filled Ground (pit, quarry, etc): 1994	243mW
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6.5 Potentially Infilled Land (Water)

Unknown Filled Ground (pond, marsh, river, stream, Dock etc): 1898	198mSW
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6.6 Local Authority Pollution Prevention and Control Enforcements

Units P1- 2 Northfleet Industrial Estate	170mW
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6.7 Landfill Sites/Waste Management Facilities

None identified within 250m of the site.

6.8 Fuel Station Entries

Shell Northfleet (Status: Open)	162mS
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6.9 Local Authority Pollution Prevention and Controls

A large number of Local Authority Pollution Prevention and Controls have been identified within the area surrounding the site, the nearest of which are as follows:

Manufacture of timber and wood-based products	15mN
Waste oil burners	96mW
Mobile screening and crushing processes	144mE
Waste oil burners	161mW
Petrol filling station	162mS
Respraying of road vehicles	170mW
Manufacture of timber and wood-based products	174mNW
Lime Processes	195mN

6.10 Control of Major Accident Hazard Sites

Britannia Refined Metals Ltd (Status: Active)	212mN
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6.11 Contemporary Trade Directory Entries

A large number of Contemporary Trade Directory Entries have been identified within the area surrounding the site, many of which are inactive multiple entries. The nearest are as follows:

Industrial Services (Inactive)	10mE
Packaging Materials Manufacturers and Suppliers (Active)	56mNW
Sand, Gravel & Other Aggregates (Inactive)	60mE
Tyre Dealers (Inactive)	61mNW
Air Conditioning Equipment & Systems (Inactive)	67mN
Ventilators & Ventilation Systems (Inactive)	69mN
Metal Products- Fabricated (Inactive)	73mNW
Sheet Metal Work (Inactive)	73mNW
Packaging Materials Manufacturers and Suppliers (Inactive)	73mNW
Tile Manufacturers (Inactive)	73mNW

Joinery Manufacturers (Active)	69mNW
Joinery Manufacturers (Inactive)	69mNW
Ventilators & Ventilation Systems (Active)	88mNW
Refrigerators & Freezers – Service & Repairs (Inactive)	73mSW
Distribution Services (Inactive)	68mSW
Concrete Reinforcements (Active)	82mSW
Electronic Engineers (Inactive)	93mW
Plastic Products – Manufacturers (Active)	99mW

6.12 **Flooding**

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

6.13 **Energy & Infrastructure Screen**

The site has been identified as being within 4km of existing or proposed wind farms or turbines.

6.14 **Radon**

The site has been identified as being within an intermediate probability radon area. No radon protective measures are considered necessary within the development.

6.15 **Environmental Constraints**

None identified within 250m of the site.

7. **Site Inspection**

7.1 An inspection of the site was undertaken on 29th March 2022 during dry, overcast weather conditions.

7.2 The site was located on the south side of a cul-de-sac within an industrial estate supporting a number of heavy industries. Light commercial premises occupied the immediate area surrounding the site.

- 7.3 The site comprised a vacant unit of brick and steel construction contained within a larger rectangular block of similar commercial premises (Plate 1). The east section of the unit supported two-storey office accommodation, with a roll-over commercial vehicle entry point to the west. Access into the building was unavailable.
- 7.4 Concrete surfacing of an unstained appearance was present at the front of the building, adjacent to the estate road (Plate 2). A trailer was parked on the roadside to the front of the building.
- 7.5 The neighbouring unit to the east was vacant and advertised for lease. A wholesale alcoholic drink business occupied the unit to the west. Overhead power cables passed over the latter unit, in close proximity to the west side of the site.
- 7.6 Access to the rear of the site was gained via a concrete road which led from the end of the estate road around the east end of the main block and alongside the rear of the units. The rear elevations of the units were of brick construction under a steel roof. A single door accessed via a short flight of steps was present on the rear elevation of the subject unit (Plate 3). Compact granular surfacing approximately 2m in width with patches of emergent weeds formed the ground surface between the concrete road and the rear elevation of the unit.
- 7.7 The rear section of the site comprised a vacant, roughly square area of compact granular surfacing located on the south side of the concrete road and enclosed on its east and west sides by steel railings. A panelled timber fence formed the south boundary of the site (Plate 4 to Plate 6). The southeast corner of the site contained a mature Oak tree.
- 7.8 A large pylon was located within the adjacent site to the southwest, in close proximity to the southwest corner of the site. Overhead power cables passed over the adjacent yard to the west. A vacant office building of block construction occupied land to the east of the site, the yard to the west being utilised for the storage of steel beer kegs. Commercial vehicles were parked on land to the south of the site.
- 7.9 No visual or olfactory evidence of contamination was observed on the site at the

time of the inspection.

8. Conceptual Site Model

- 8.1 Based upon the available information the site would appear to have comprised undeveloped land until the existing commercial unit was constructed during the latter part of the twentieth century. It is reasonable to assume that historic tramways which may have crossed the southeast corner of the site would have been removed prior to the site's development. Though referred to as a factory or works by the Landmark report there is some uncertainty regarding the previous use of the unit, though there is no evidence to suggest that significant contaminative processes have been carried out within the building. With regard to the vacant area of land at the rear of the site, there is similarly no evidence to indicate that it has supported previous contaminative activities and no underground fuel storage tanks have been identified beneath the site. Consequently no on-site sources of contamination which could have been identified and redevelopment of the site is considered to pose a low risk.
- 8.2 Historic industrial activities including a number of cement works and a paper mill existed within the area surrounding the site, some of which remain currently active. Extensive commercial development took place within the surrounding area following reclamation of the marshes toward the end of the twentieth century and would have been concurrent with the development of the site. The existing commercial processes located adjacent to the site are relatively inconsequential and due to the site's enclosed location it is considered unlikely to have been impacted by surrounding activities. Historic tanks and electricity substation facilities within the local area are situated in excess of 50m from the site and are therefore considered to be inconsequential. No off-site sources of potential contamination have therefore been identified.
- 8.3 No landfill sites with the potential to contain biodegradable material have been identified within 250m of the site. Infilling of the flooded quarry to the southwest had been completed by 1910 and the infilled quarry to the west is relatively remote from the site. CIRIA report c665 states that gas generation of landfill sites would be insignificant by thirty years and minimal by fifty years, therefore gas generated

during any decomposition would have peaked and be in decline. Radon protection measures are not required within the design of the proposed development and the topography of the site does not indicate the excessive quantities of made ground beneath its surface. No credible sources of gas migration have been identified and the risk to the site from ground gas emissions 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
- 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 leakages, spillages or possibly present in made ground e.g. TPH, PAH.	Toxic and carcinogenic	Future Users	Inhalation, ingestion and skin contact	Serious	Low	No evidence of leakages, spillages or significant made ground beneath site.
		Adjoining site occupiers	Ditto	Negligible	Low	Minimise dust, avoid spillages.
		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 used by contractors' plant during construction work.
Inorganic contaminants associated with industrial processes or possibly present in made ground e.g. arsenic, lead, etc	Attack on plastic or rubber	Building Services and Fabric	Leaching and diffusion	Serious	Low	No evidence of potentially contaminative processes on site. Consult local water authority if in doubt over suitability of materials.
		Future users	Inhalation, ingestion and skin contact	Serious	Low	No evidence of potentially contaminative processes or significant made ground beneath site.
		Local residents	Ditto	Moderate	Low	Minimise dust where possible
		Site Workers	Ditto	Moderate	Low	Provision of protective clothing/equipment. Minimise dust.
Phytotoxic metals e.g. copper, zinc.	Phytotoxic	Groundwater	Leaching, permeable strata, groundwater	Serious	Low	No evidence of potentially contaminative processes on site. No action considered necessary.
		Plants	Uptake	Serious	Negligible	No garden/landscaping proposed within development.
		Groundwater	Leaching, permeable strata, groundwater	Serious	Low	No evidence of potentially contaminative processes on site. No action considered necessary.
		Future Users	Air inhalation	Serious	Low	Removal and appropriate disposal by experienced contractor if discovered on site.
Asbestos possibly present in existing building	Carcinogenic and Respiratory Irritant	Adjoining site occupiers	Ditto		Low	
		Site workers				
		Future Users	Service ducts	Serious	Low	No areas of biodegradable landfill identified within 250m of site. Historic quarry to SW infilled in excess of one hundred years ago. Infilled quarry to west relatively remote. No radon protection measures necessary.
		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 on the information currently available, there is little evidence to suggest that the site has been significantly impacted by either on-site or off-site contaminative activities. The extent of the proposed development is therefore not considered to pose a significant risk to receptors including human health, the water environment or subterranean plastic services.

- 10.5 No areas of garden or landscaping are proposed within the development, therefore the risk to plant life is considered negligible.
- 10.6 Further action is considered unnecessary providing that the following mitigation is undertaken during the course of the development:
- Asbestos survey of the existing building followed by the dismantling of any encountered asbestos-containing materials by an experienced contractor and removal to a suitably licensed disposal facility.
 - Provision of appropriate PPE for site workers during the course of construction work.
 - Minimisation of dust emissions as far as possible in order to protect site workers and occupants of neighbouring premises.
 - Removal of soil excavated from the area of the proposed car park to an appropriately licensed waste depository.
 - Appropriate precautions taken with regard to the storage of any fuel or lubricants utilised by contractors' plant during the course of the development in order to prevent the migration of pollutants into the underlying strata. Such products should be stored within a secure, preferably bunded area of the site.
- 10.7 In the event that contamination not detected by the Desk Study is encountered 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 clinker, ash or asbestos fragments.
- 10.8 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

March 2022



Plate 1



Plate 2



Plate 3



Plate 4



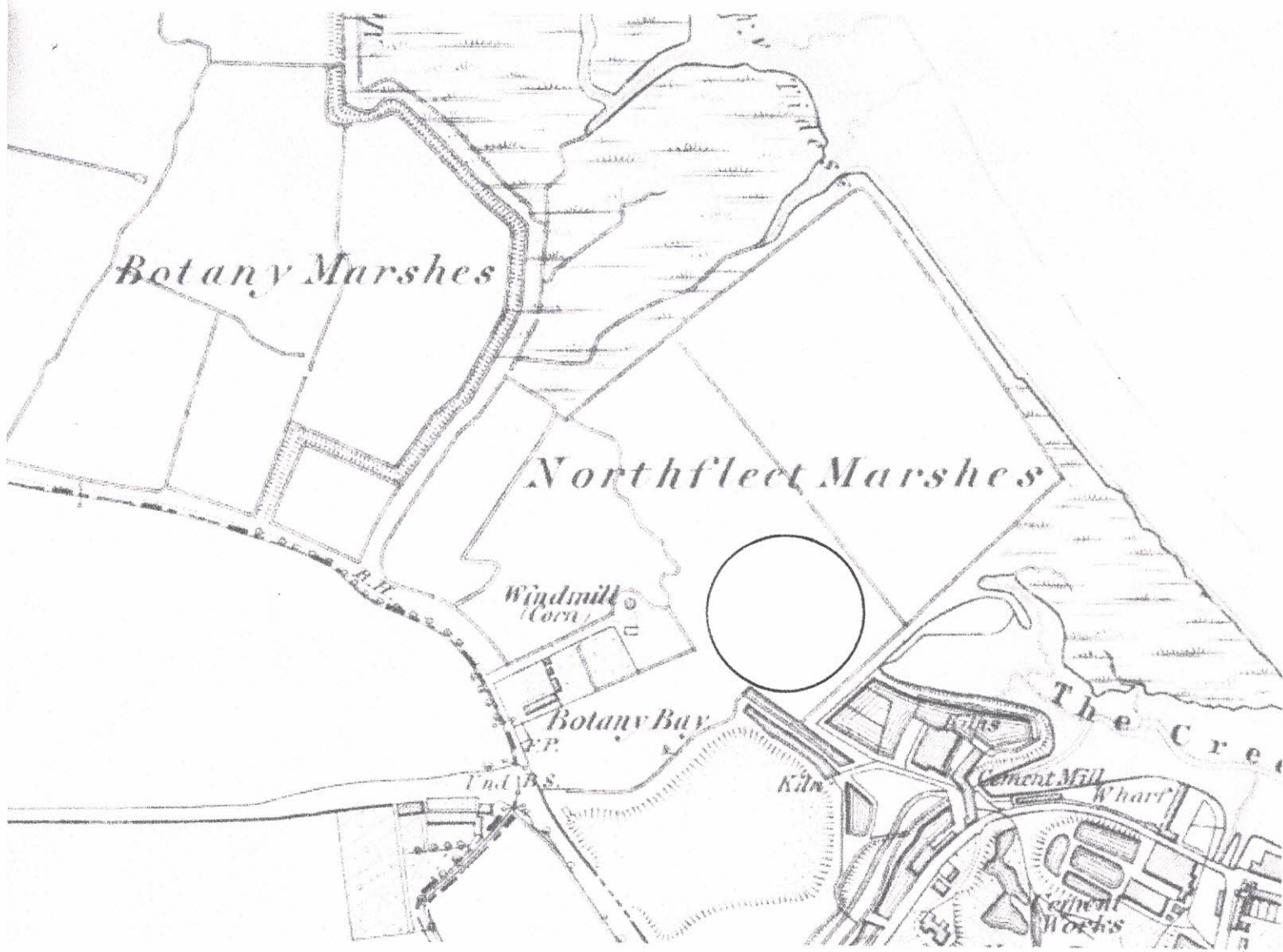
Plate 5



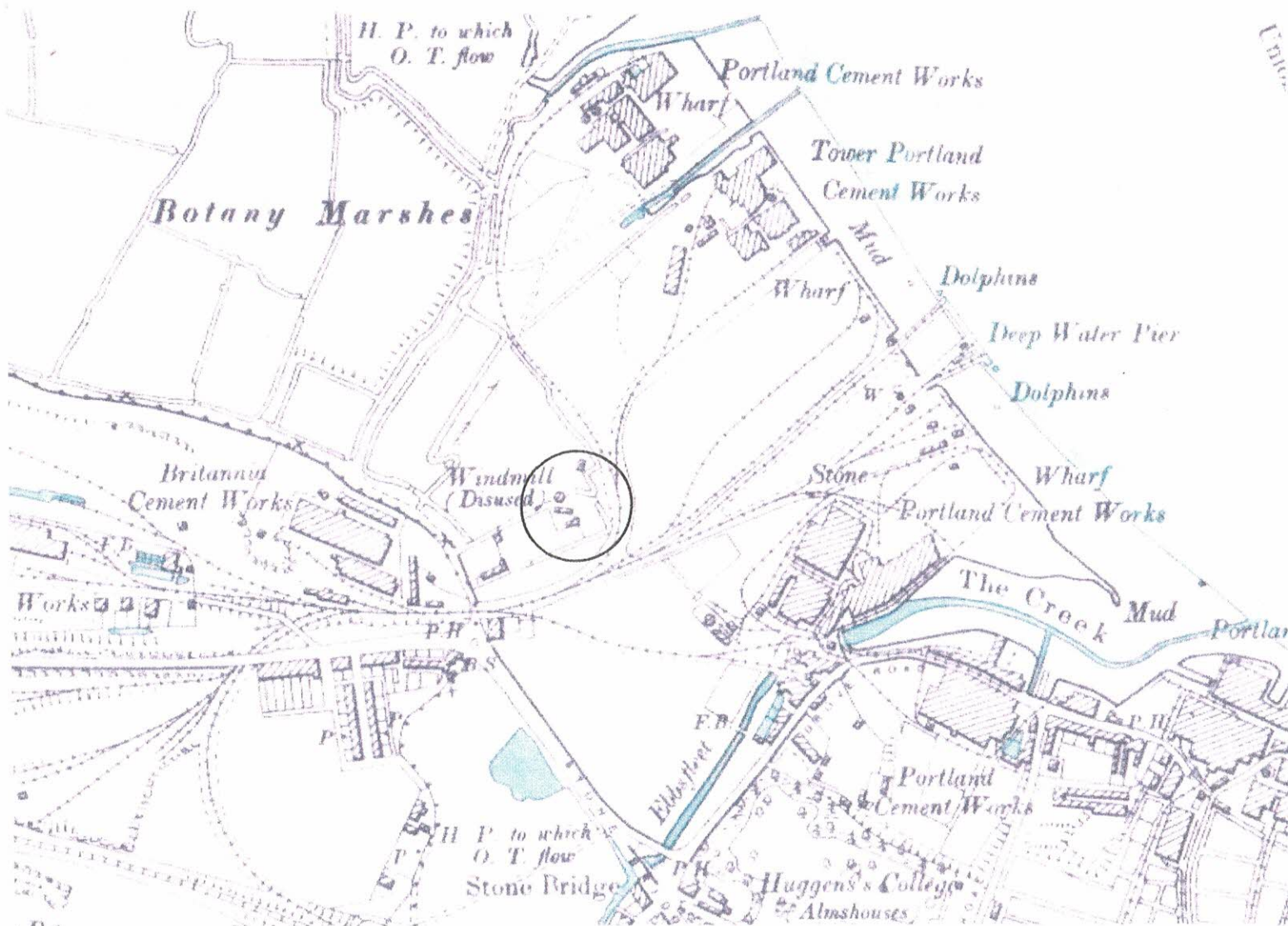
Plate 6

Appendix A

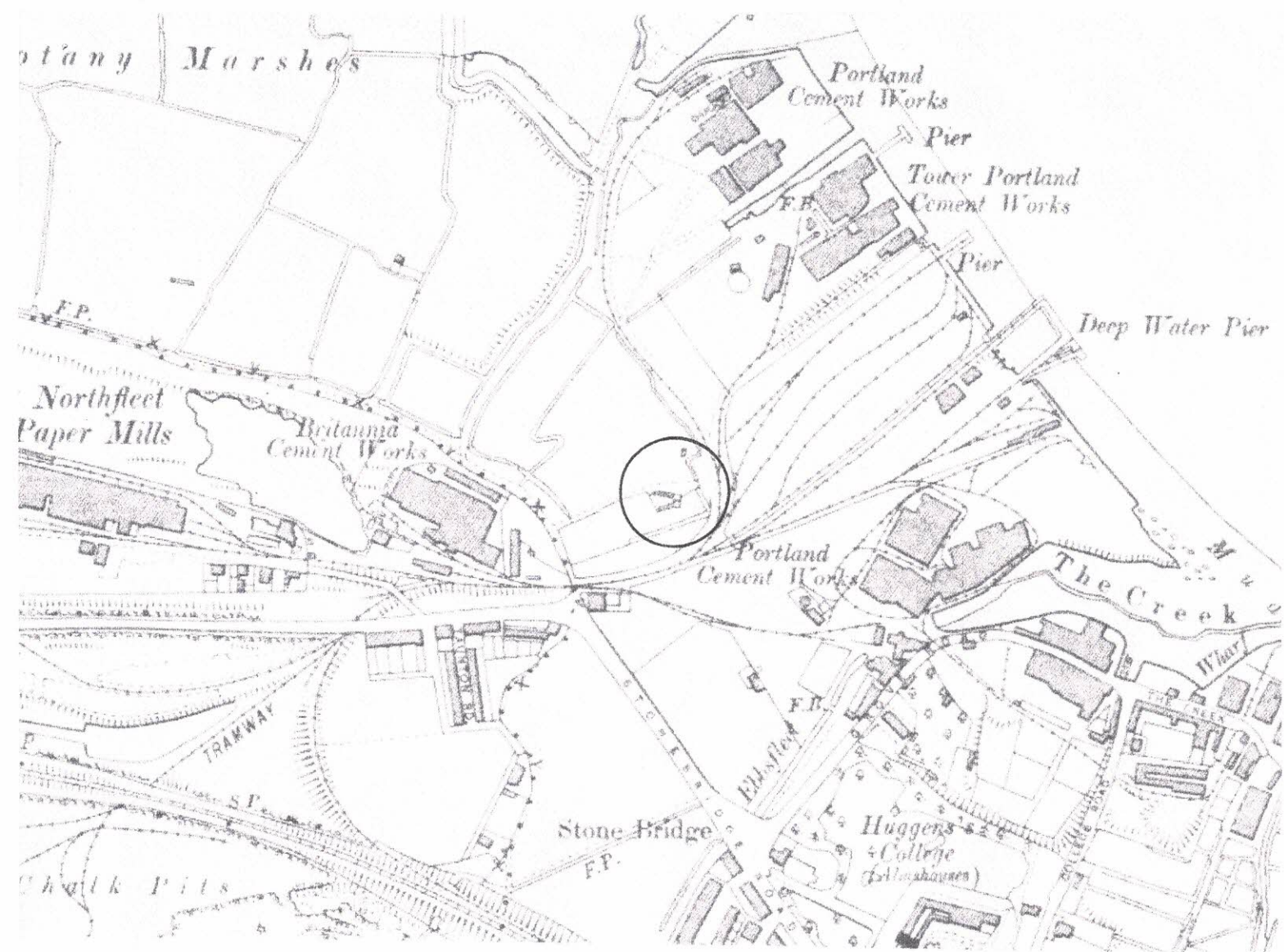
Site History



Unit K6 Lower Road, Northfleet.
OS map scale 1:2500 1869.

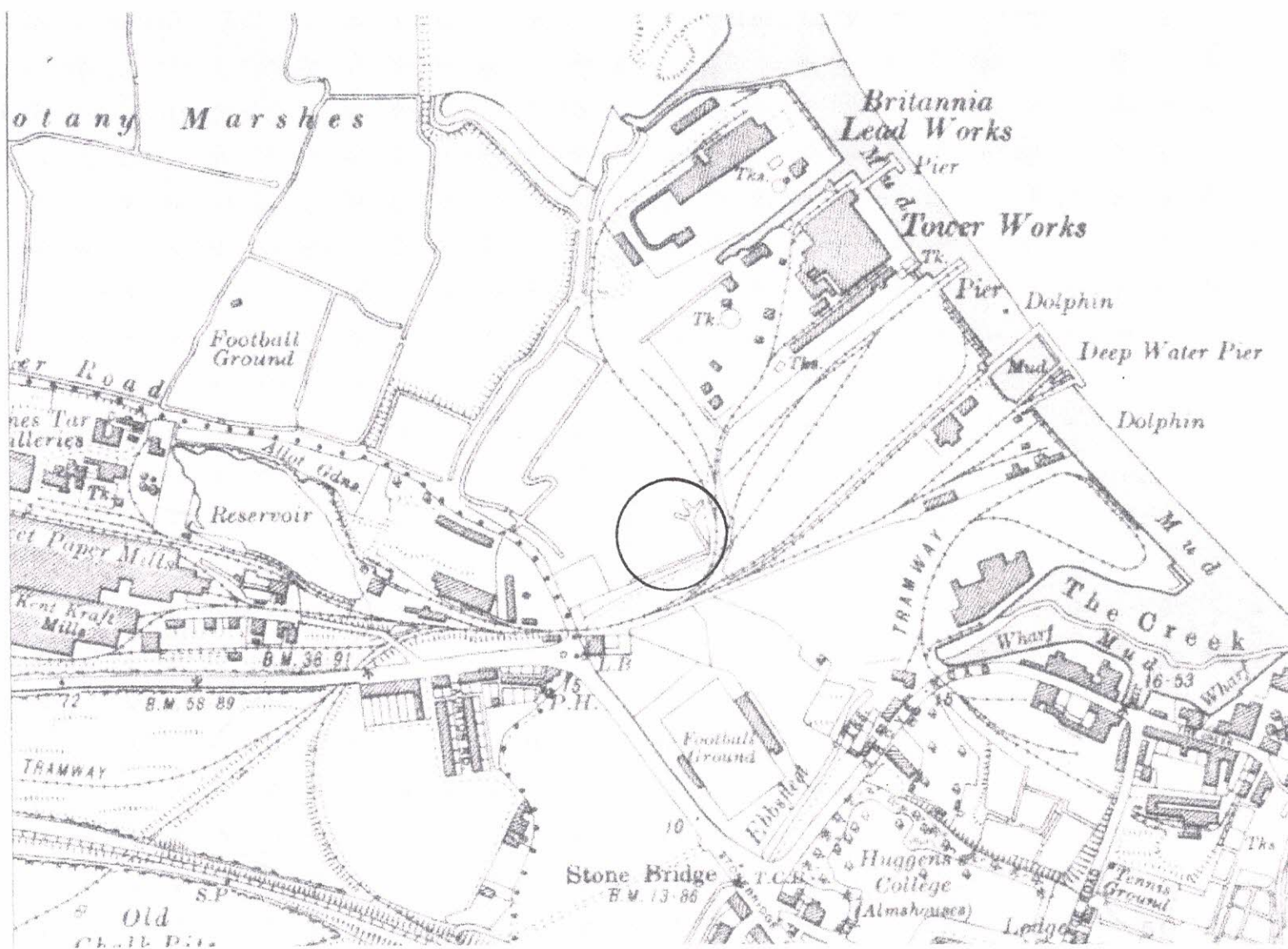


Unit K6 Lower Road, Northfleet.
OS map scale 1:2500 1898.

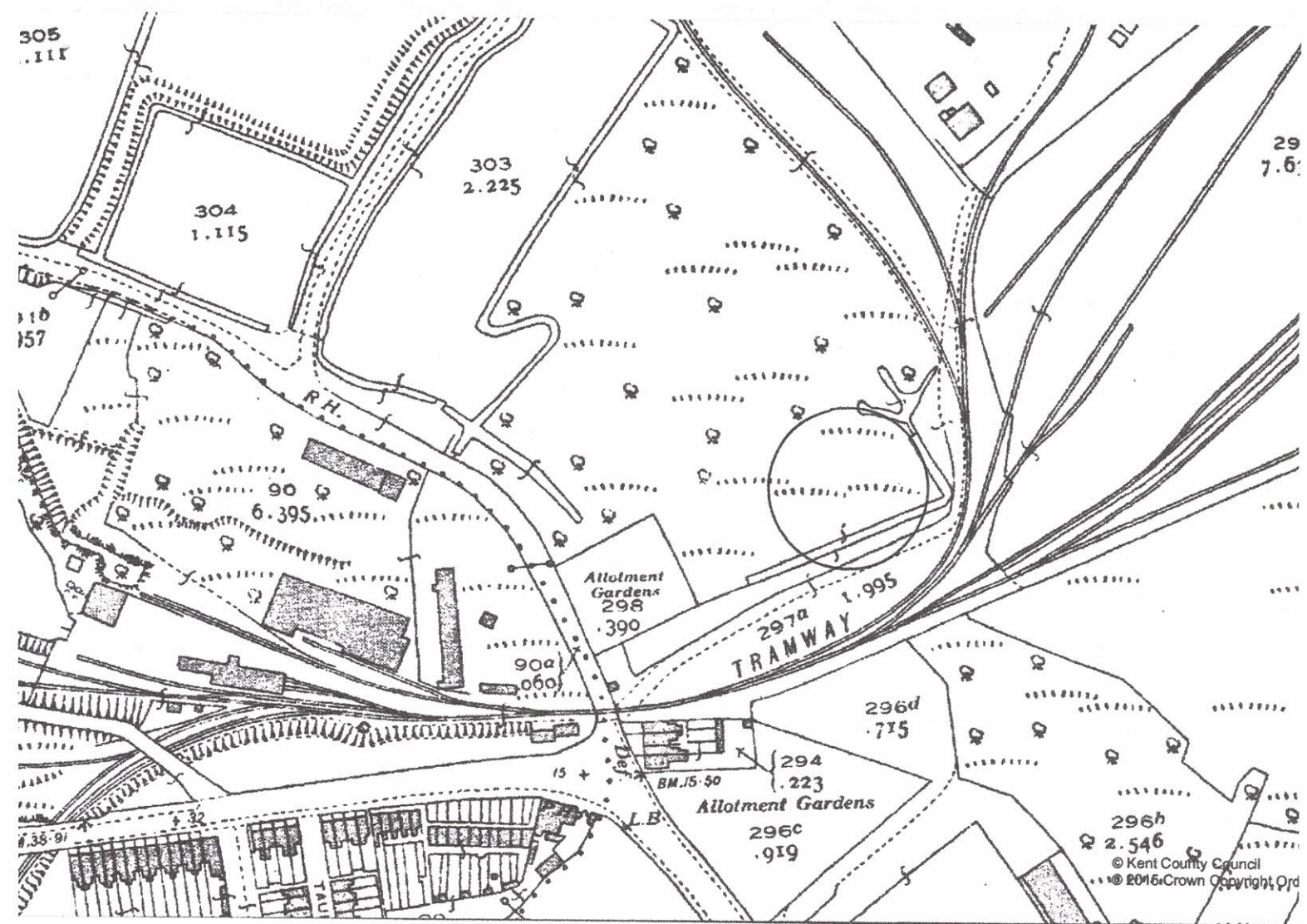


Unit K6 Lower Road, Northfleet.

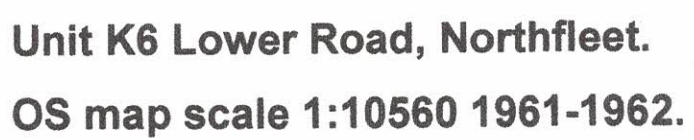
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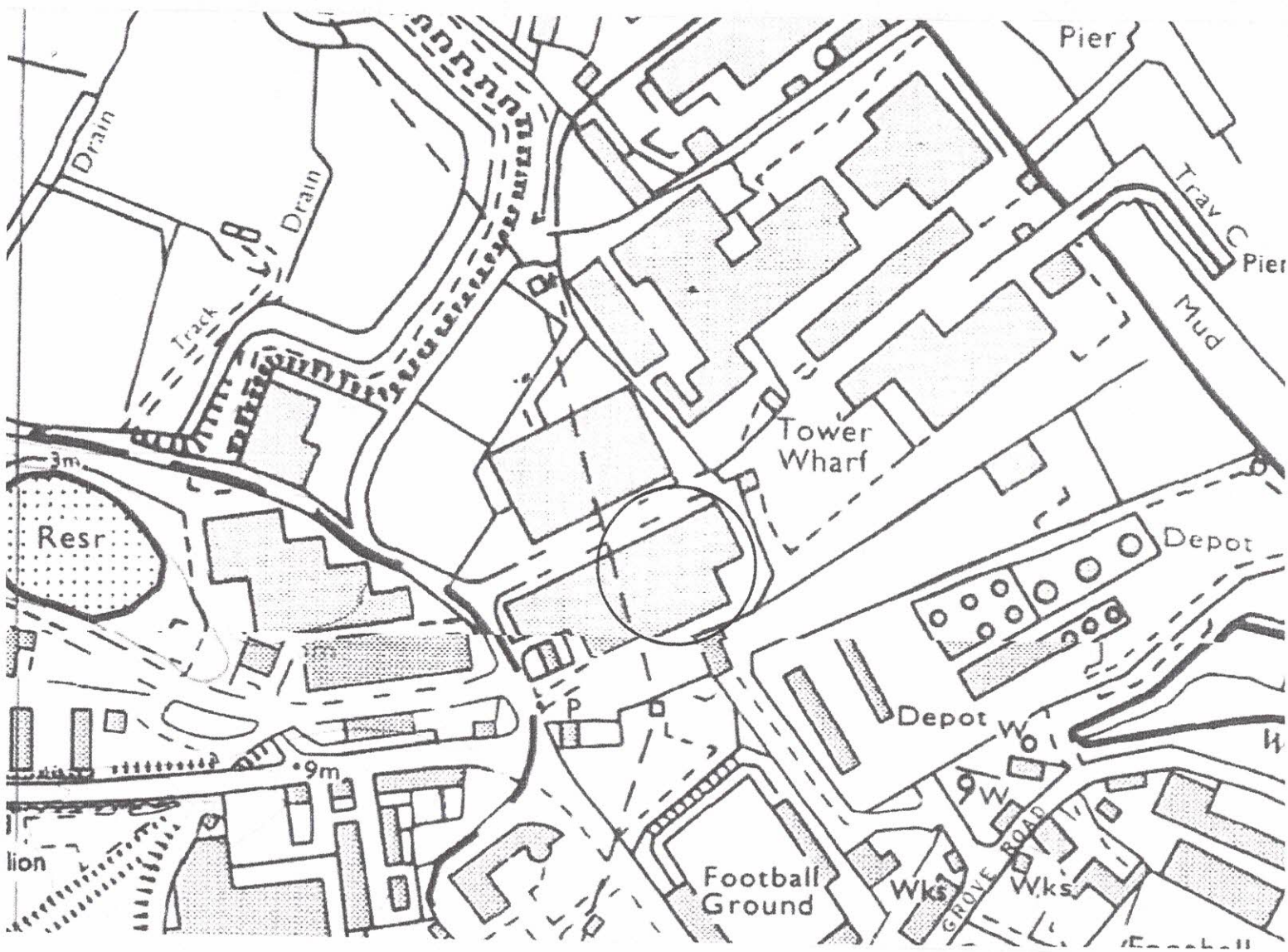
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OS map scale 1:2500 1929-1952.



OS map scale 1:10560 1961-1962.



Unit K6 Lower Road, Northfleet.
OS map scale 1:10000 1991-1993.