R. CARR GEOTECHNICAL SERVICES

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LAND ADJACENT FINCHES FARM, LABOUR IN VAIN ROAD, STANSTED, SEVENOAKS, KENT TN15 7NY.

PHASE I GEO ENVIRONMENTAL DESK STUDY AND PRELIMINARY RISK ASSESSMENT

August 2020

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Land adjacent Finches Farm, Labour in Vain Road, Stansted, Kent TN15 7NY.

1. Introduction

1.1 This report has been prepared on behalf of Mrs J Middelboe, prospective developer of land located to the east of Finches Farm, Labour in Vain Road, Stansted.

1.2 The proposed development is understood to comprise the construction of a detached dwelling with an associated garage and area of garden. Plans of 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:

- Model Procedures for the Management of Land Contamination. Environment Agency Contaminated Land Report 11 (CLR 11)
- GPLC1- Guiding Principles for Land Contamination. Environment Agency 2010
- National Planning Policy Framework (NPPF) (2012)

2. Topography

2.1 The site is located to the north of Labour in Vain Road at OS Land Ranger map reference TQ 600 605. A location plan of the site is provided in Fig.1.

2.2 The site is located within the base of a small valley, ground surface of the site itself being of a relatively level contour.

3. Geology

3.1 Reference to the local Geological Survey sheet (no. 287: Sevenoaks) has indicated that the site is located upon an exposure of the Lewes Nodular Chalk member of the White Chalk subgroup (formerly referred to as the Upper Chalk) with overlying deposits of the Clay with Flints being denoted in close proximity to the east and west.

3.2 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.

3.3 The Clay with Flints is a form of Head Deposit, comprising flints from the chalk suspended within a matrix of intermediate to highly plastic clay soil derived from the Lambeth Group and London Clay formations.

4. Hydrology and Hydrogeology

4.1 No surface waterbodies 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. Soil Classification: Soils of High Leaching Potential (U).

4.3 A search of borehole records retained by the British Geological Society (BGS) has indicated that groundwater levels in the local area exceed a depth of 10m.

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 1:1250 1871-1890:

On site: The site is undeveloped, comprising open agricultural land located on the north side of a country lane. A small building or animal enclosure is denoted on the front, southwest corner of the site.

Off site: A complex of farm buildings is situated on adjacent land to the west of the site, an associated pond possibly used as a sheep wash being in evidence next to the site's southwest corner. The area surrounding the site comprises mainly open agricultural land with hedgerows. Extensive deciduous woodland.is located within 50m to the southwest of the site.

5.3 OS map scale 1:1250 1897--1902:

On site: No significant change.

Off site: No significant change.

5.4 OS map scale 1:1250 1907-1923:

On site: The building/enclosure has been removed from the southwest corner of the site.

Off site: The former pond to the southwest has been infilled.

5.5 OS map scale 1:1250 1929-1952:

On Site: Three small rectangular buildings of agricultural appearance have been constructed in the southwest section of the site.

Off Site: A larger, roughly square building has also been constructed within the farm complex, adjacent to the site's southwest corner. An adjoining pair of possibly residential buildings are denoted within 50m on the site of the former woodland to the southwest. Detached dwellings are also now in evidence within 100m to the west and southwest.

5.6 OS map scale 1:10560 1961:

On site: No significant change.

Off site: No significant change.

5.7 OS map scale 1:10000 1978-1992:

On site: No significant change.

Off site: The Tower Industrial Estate has been developed within 60m to the southwest. Otherwise little change.

5.8 It is understood that the site was acquired by the current owners approximately five years ago, having previously been owned for some fifty years by a small building company for the storage of tools, health and safety equipment and inert building materials including bricks and blocks, plastic drainage fittings, timber, scaffolding, insulation materials and cement. The northeast corner of the site is also reported to have contained a mobile office. Storage sheds and a garage formerly providing overnight parking for a truck remain on the site.

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 C:

6.2 Historical Land Use

Factory or works	59m SW

6.3 Landfill Sites

None identified within 250m of the site.

6.4 Registered Waste Treatment or Disposal Sites

Scrapyard Licence Completed//Surrendered	112m SW

6.5 Environmental Permitting Regulations – Waste Sites

Metal Recycling (Licence surrendered)	250m SW

6.6 **Authorised Industrial Processes**

None identified within 250m of the site.

6.7 **Contemporary Trade Directory Entries**

Pest & Vermin Control	83m W
Car Breakers & Dismantlers	106m SW
Garage Services	108m SW
Garage Services	109m SW
Car Dealers	109m SW
Blinds, Awnings & Canopies	119m SW
Garage Services	145m SW
Car Dealers (3)	144m SW
Blinds, Awnings & Canopies	145m SW
Car Dealers	159m SW

6.8 **Flooding**

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

6.9 **Radon**

Radon Potential	Lower Probability
Radon Protection Measures	None required

6.10 **Environmental Constraints**

Ancient Woodland	118m and 176m

7. Site Inspection

7.1 An inspection of the site was undertaken on 24th August 2020 in clear, sunny weather conditions.

7.2 The site was situated within a semi-rural area on the north side of a narrow country road. Undeveloped agricultural land prevailed to the south and east of the site. The

former Finches Farm complex of buildings remained to the west, the latter having been converted to residential use. Extensive gardens associated with Finches Farm abutted the north boundary of the site.

7.3 The front boundary of the site was secured by a 2.5m high timber fence, access into which was gained via a pair of padlocked timber gates (Plate 1). A single garage of rendered brick construction under a flat felt roof occupied the front, southeast corner of the site, the timber doors of the garage opening directly onto Labour in Vain Road. A second-hand vehicle was stored in the garage (Plate 2). The interior of the garage was in a clean and tidy condition, no evidence of hydrocarbon staining being apparent on the exposed areas of its concrete floor slab (Plate 3).

7.4 Ground surface on the central area of the site comprised recently mown grass and weeds, the rear of the site appearing to have been slightly raised in level. Exposed patches of brick hardcore indicated that granular material had been deposited upon the site in order to provide hardstanding within the builder's yard.

7.5 Several railway sleepers and concrete blocks which had previously supported the mobile office remained to the rear of the garage in the site's northeast corner, together with a roll of plastic pipe, several road cones and plastic water butts (Plate 4 and Plate 5). A number of logs, fence panels and concrete blocks were stored alongside the garage.

7.6 Bricks and concrete blocks were also stacked on a timber pallet at the front of the site, alongside a large tarpaulin (Plate 6).

7.7 The west section of the site supported a rectangular building of brick and block construction under a corrugated steel roof (Plate 7). A number of plastic pipes and pieces of timber were leant against the east side of the building.

7.8 Entry into the building was gained through a pair of padlocked timber doors, the inside of the building being generally devoid of contents with the exception of a few packs of insulation material and a chair (Plate 8). Timber racking located in the east side of the building had been generally cleared of its contents, only a few lengths of

timber remaining. The concrete floor of the building was of a clean appearance other than an area of staining caused by rainwater leakage from the roof.

7.9 A timber lean-to under a corrugated steel roof was located alongside the west elevation of the larger store, a small area of concrete forming the ground surface at the front of the structure. Four fire extinguishers and three stacked chairs were placed on the concrete surfacing (Plate 9).

7.10 Access into the lean-to was provided by a timber door, various items of PPE, temporary plastic barriers and packages of insulation materials being observed to remain on racking inside the structure (Plate 10). The concrete floor of the structure was of a clean and unstained appearance.

7.11 The west boundary of the site was formed by the side of the lean-to and the rear elevation of a steel shed located within the neighbouring site. A row of mature *Leylandii* conifers and Portuguese Laurels formed the site's north boundary whereas the east boundary comprised temporary Heras fence panels and the east flank wall of the garage. An overgrown verge supporting grass and stinging nettles was present between the front boundary of the site and the adjacent road, a large Hazel tree being located next to the site's southwest corner.

7.12 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 Since the commencement of Ordnance Survey mapping the site would appear to have originally comprised undeveloped agricultural land probably associated with sheep farming. Small buildings were constructed on the site during the middle part of the twentieth century, some of which have subsequently been removed. The site was utilised as the yard of a local building company for approximately fifty years prior to being acquired by the current owners some five years ago, since which time it has remained disused. The site is underlain by a Principal Aquifer. A low to moderate risk to receptors including human health, plant life and subterranean plastic services

has been identified from the following sources of potential contamination:

- Metals, polynuclear aromatic hydrocarbons (PAH) and petroleum hydrocarbons possibly occurring within site surfacing material
- Possible asbestos fibres from previously demolished buildings

8.2 The site is considered to pose a low risk to groundwater as any potential contamination is likely to be superficial and BGS records indicate that groundwater is unlikely to occur for some considerable depth. No surface waterbodies have been identified within 500m of the site.

8.3 A pest and vermin control business has been identified 83m to the west, though this is considered inconsequential and unlikely to have impacted the site. Other historic and more recent potentially contaminative activities identified within 150m of the site including garage services and a scrapyard are all located within the industrial estate to the southwest. The estate is topographically remote from the site, therefore the impact that any of the identified activities are likely to have exerted upon the site is considered highly unlikely. The risk to the site from off-site sources of potential contamination is therefore considered to be low.

8.4 No areas of landfill have been identified within 250m of the site. The former pond adjacent to the site's southwest corner had been infilled by 1923. Infilled ponds do not generally pose a risk of significant gas migration (CIEH, 2008) and CIRIA report c665 states that gas generation on infilled land would be insignificant by thirty years, becoming minimal by fifty years. Any gas generated during decomposition would therefore have peaked and be in decline. 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 necessary 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 possibly present in made ground e.g. TPH, PAH	Toxic and carcinogenic	Future Users	Inhalation, ingestion and skin contact	Serious	Low to moderate	Site investigation to determine degree of risk. Removal of contaminated soil, if necessary.
		Adjoining site occupiers	Ditto	Moderate	Low	Minimise dust, avoid spillages.
		Site workers	Ditto	Serious	Low	Provision of appropriate protective clothing and equipment.
		Groundwater Drains & surface water	Leaching, permeable strata, drainage	Serious	Low	Any contamination likely to be superficial. Appropriate precautions with storage of contractor's fuel and lubricants.
	Attack on plastic or rubber	Building Services and Fabric	Leaching and diffusion	Serious	Low to moderate	Soil testing to confirm degree of risk. Underground services to be surrounded with clean material. Consult local water authority if in doubt over suitability of materials.
Inorganic contaminants associated with made ground e.g. arsenic, lead, etc.	Zootoxic	Future users	Inhalation, ingestion and skin contact	Serious	Low to moderate	Site investigation to determine degree of risk. Removal of contaminated soil, if necessary.
		Local residents	Ditto	Moderate	Low	Minimise dust where possible
		Site Workers	Ditto	Moderate	Low	Provision of protective clothing/equipment. Minimise dust.
		Groundwater	Leaching, permeable strata, groundwater	Serious	Low	No evidence of industrial processes on site. Site underlain by relatively impermeable clay soil.
Phytotoxic metals e.g. copper, zinc.	Phytotoxic	Plants	Uptake	Serious	Low	No evidence of industrial processes or significant made ground on site. Existing vegetation of healthy appearance.
		Groundwater	Leaching, permeable strata, groundwater	Serious	Low to moderate	Site investigation to determine degree of risk. Replacement of contaminated soil with clean topsoil in garden areas, if necessary.
Asbestos from demolished buildings	Carcinogenic and Respiratory Irritant	Future Users	Air inhalation	Serious	Low to moderate	Removal and disposal by experienced contractor if discovered on site
		Adjoining site occupiers	Ditto			
		Site workers			Low	
Ground gases e.g. methane, carbon dioxide.	Asphixiant, explosive	Future Users	Service ducts	Serious	Low	No areas of biodegradable landfill or infilled ground identified within 250m of site. Former pond to southwest infilled by 1923.
		Adjoining site occupiers Site workers	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 findings of the desk study the site is considered to poise a low to moderate risk to human health, plant life and potable water services. It is therefore recommended that a limited intrusive investigation comprising shallow boreholes or trial pits is undertaken in order to ascertain whether contamination exists on the site. Samples of soil obtained from the excavations should be tested for a suite of common contaminants including speciated PAH, petroleum hydrocarbon fractions and presence of asbestos at an accredited laboratory. Areas of proposed garden

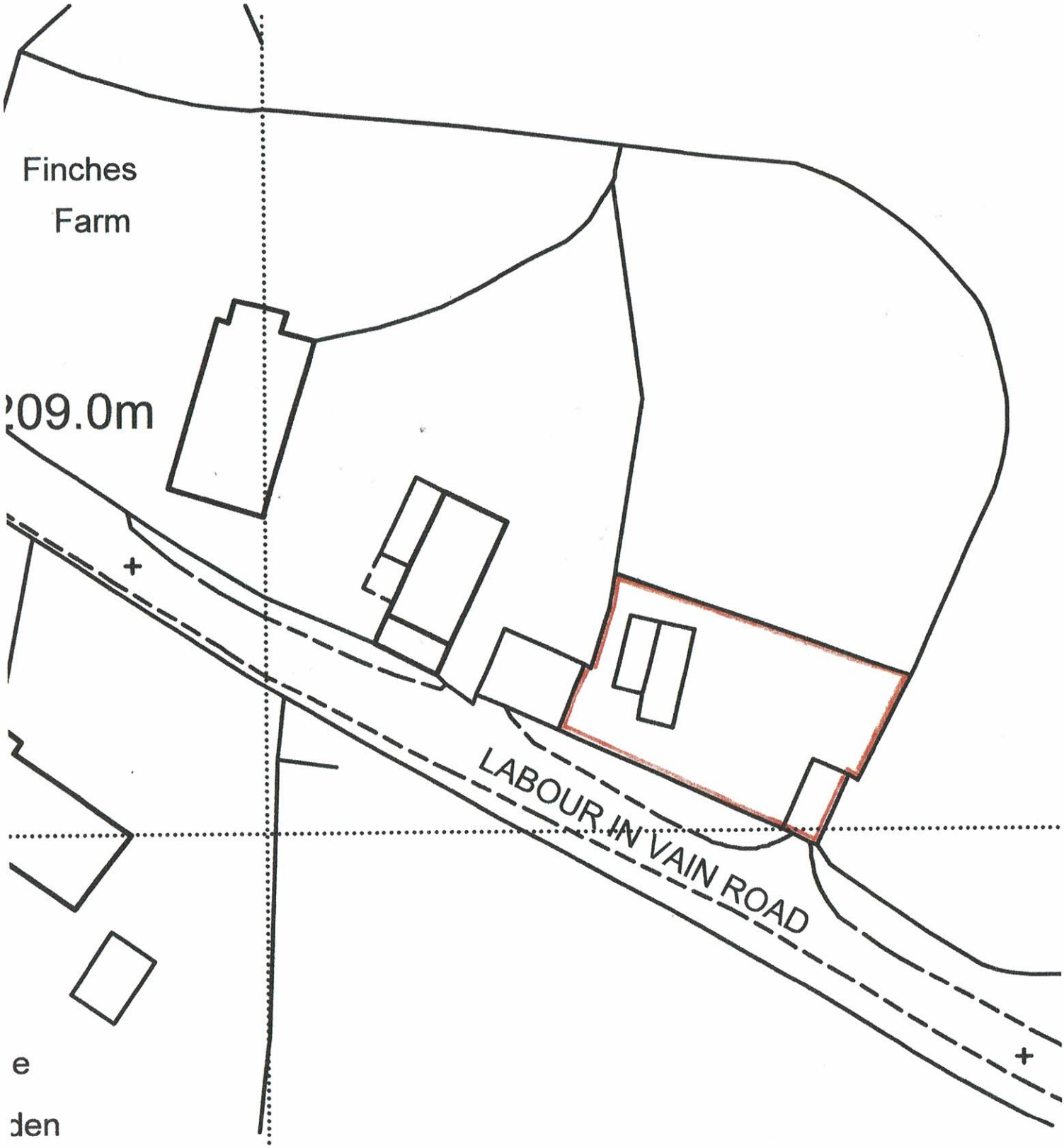
should be particularly targeted by the investigations. Parameters for the design of appropriate foundations to support the new dwelling could also be derived from the investigations.

10.5 Any asbestos-containing material discovered within the fabric of the existing buildings should be dismantled by an experienced contractor and disposed of at an appropriately licensed waste facility.

10.6 Every precaution must 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.

10.7 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
August 2020



Land adjacent Finches Farm, Labour in Vain Road, Stansted. Fig 1 Site Location Plan.

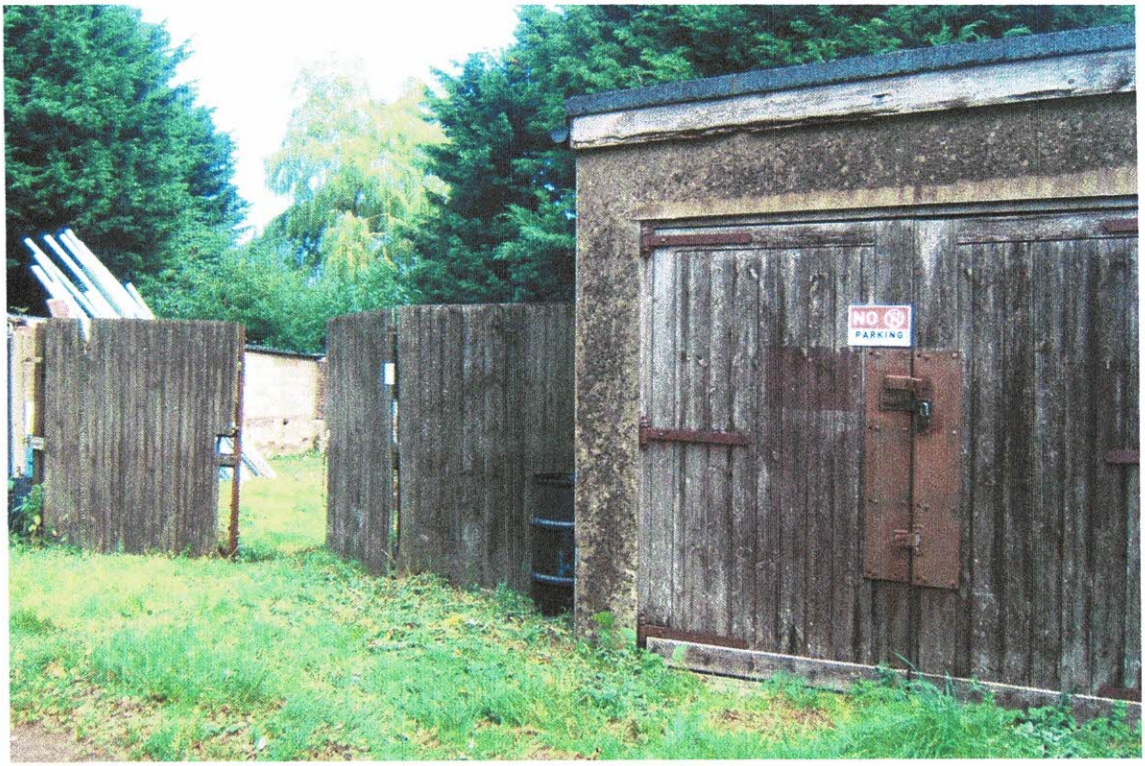


Plate 1

Plate 2

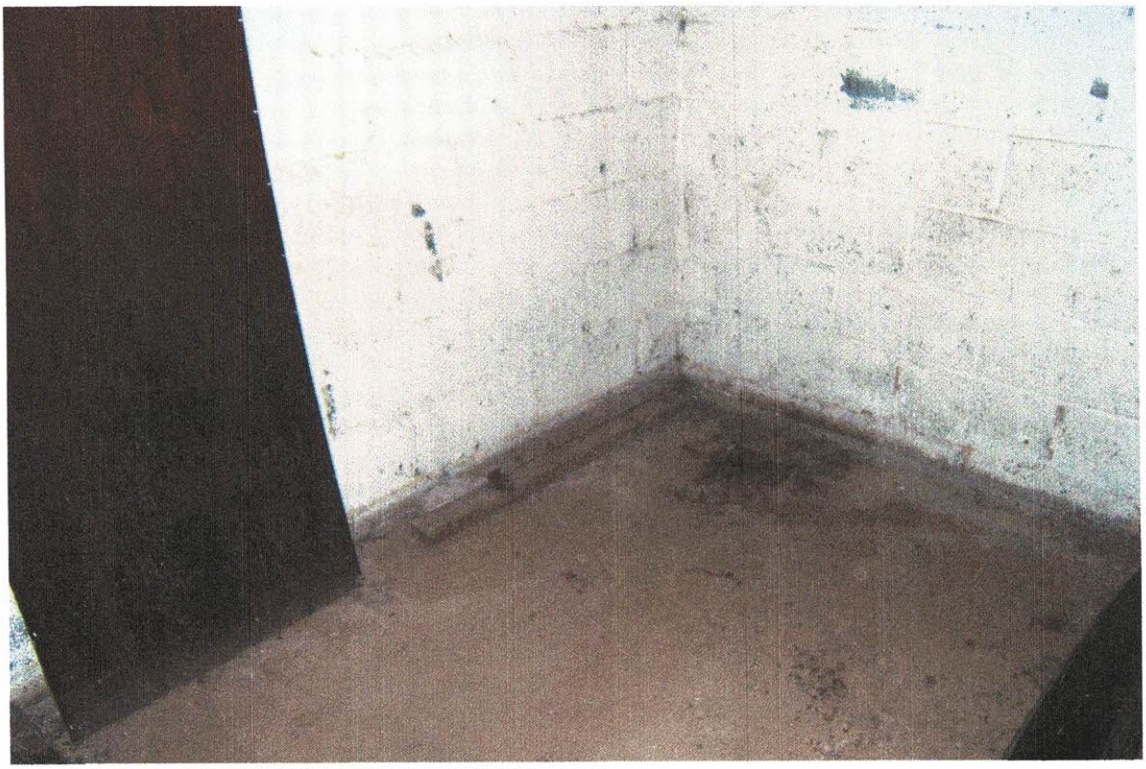


Plate 3

Plate 4

Plate 5

Plate 6

Plate 7

Plate 8

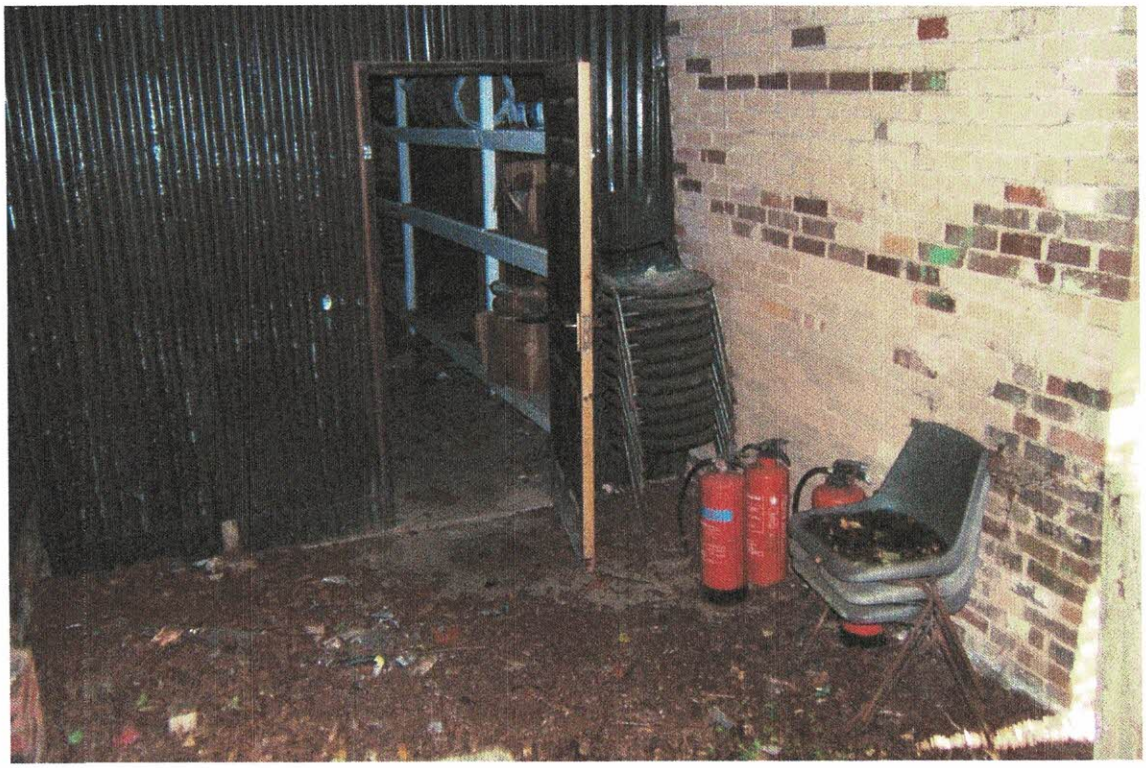
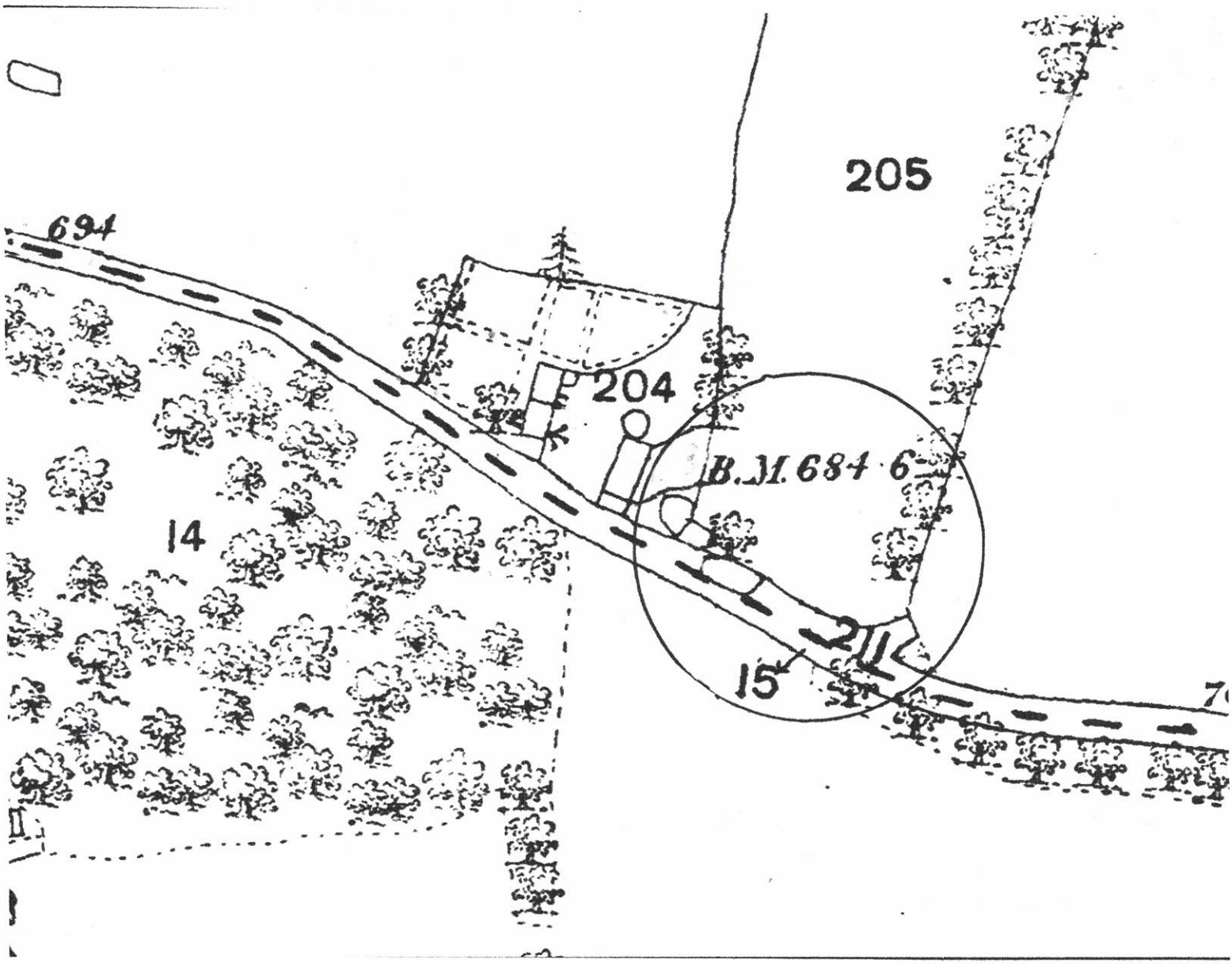


Plate 9

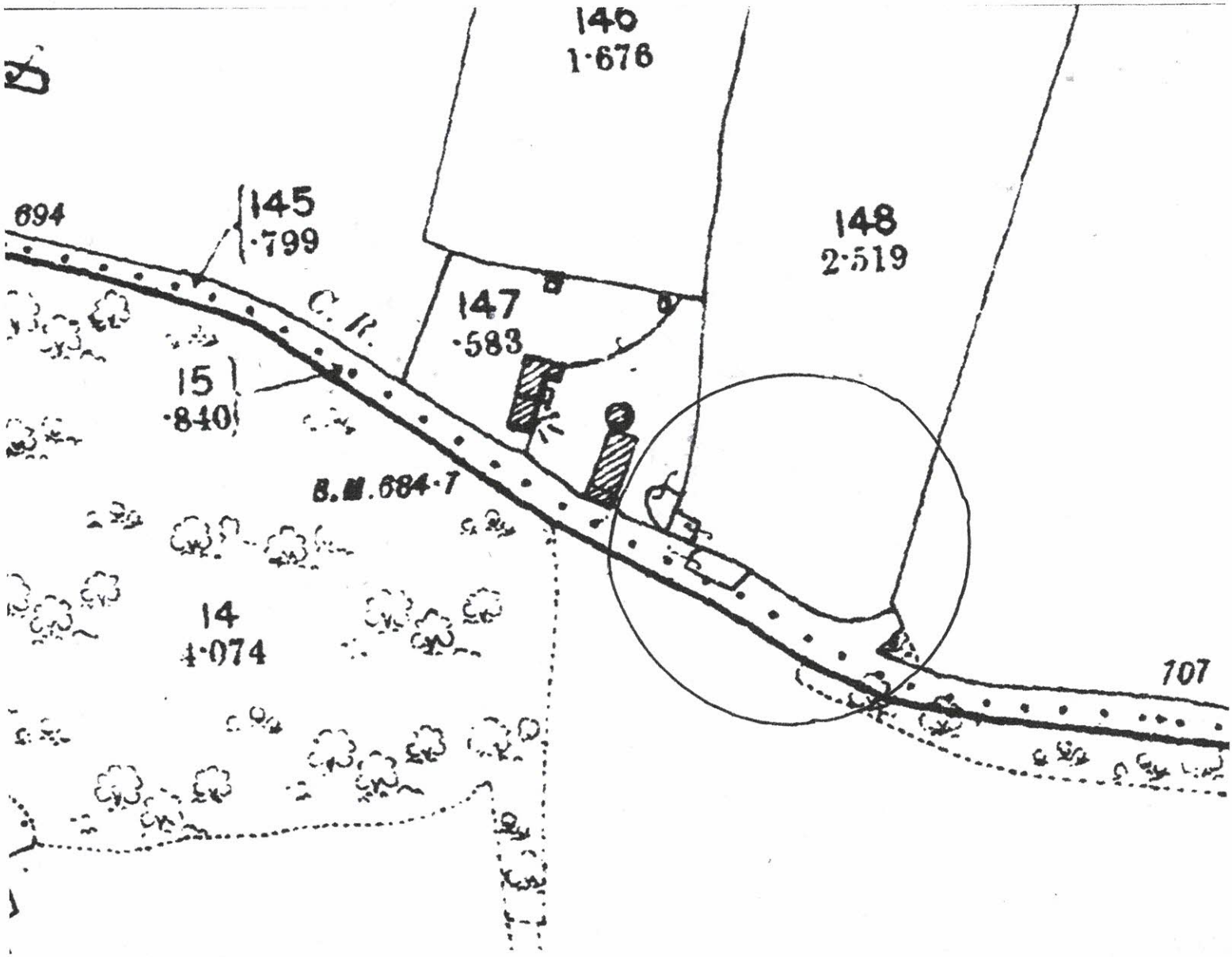
Plate 10

Appendix A

Site History



Land adjacent Finches Farm, Labour in Vain Road, Stansted. OS map scale 1:1250: 1871-1890.



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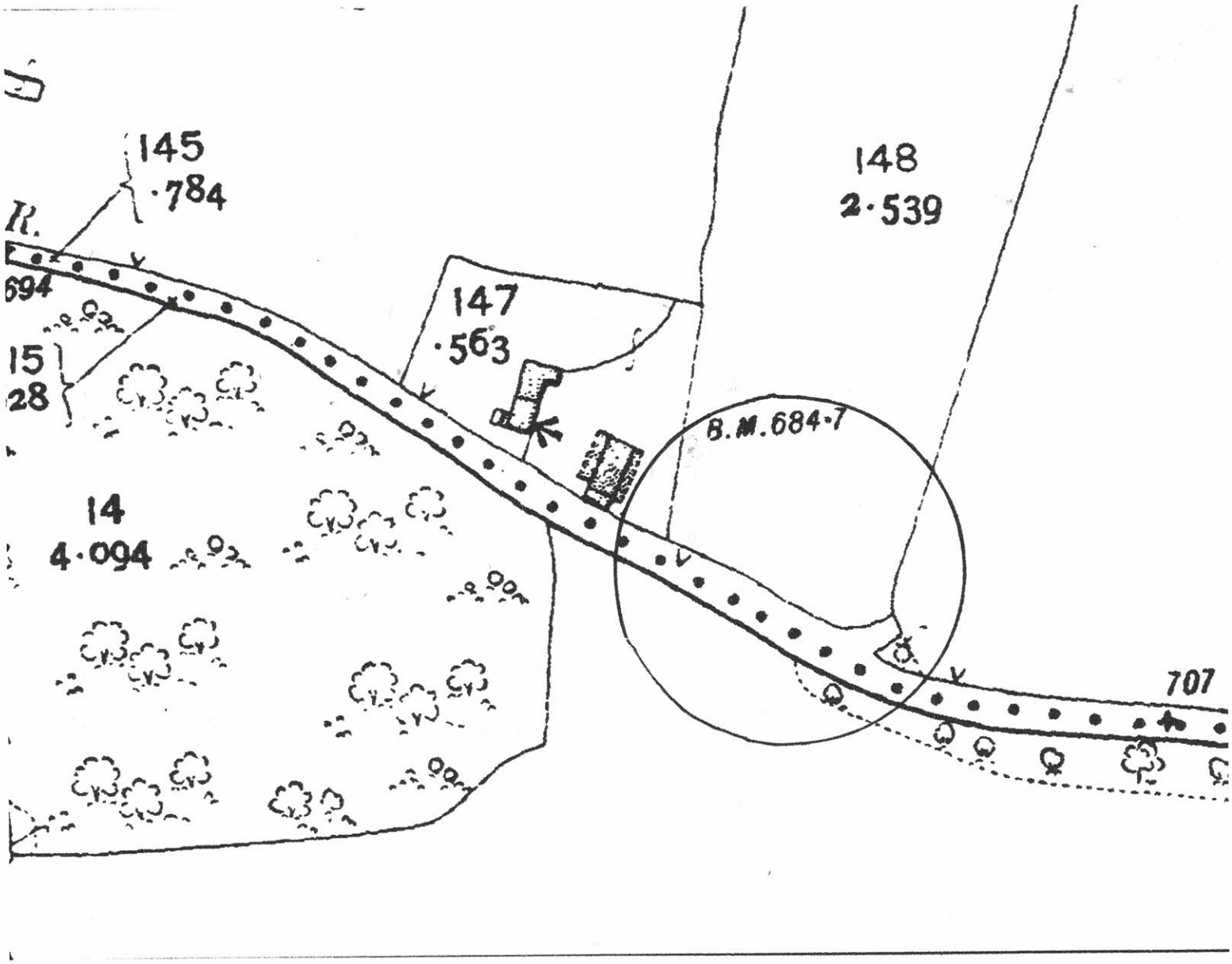
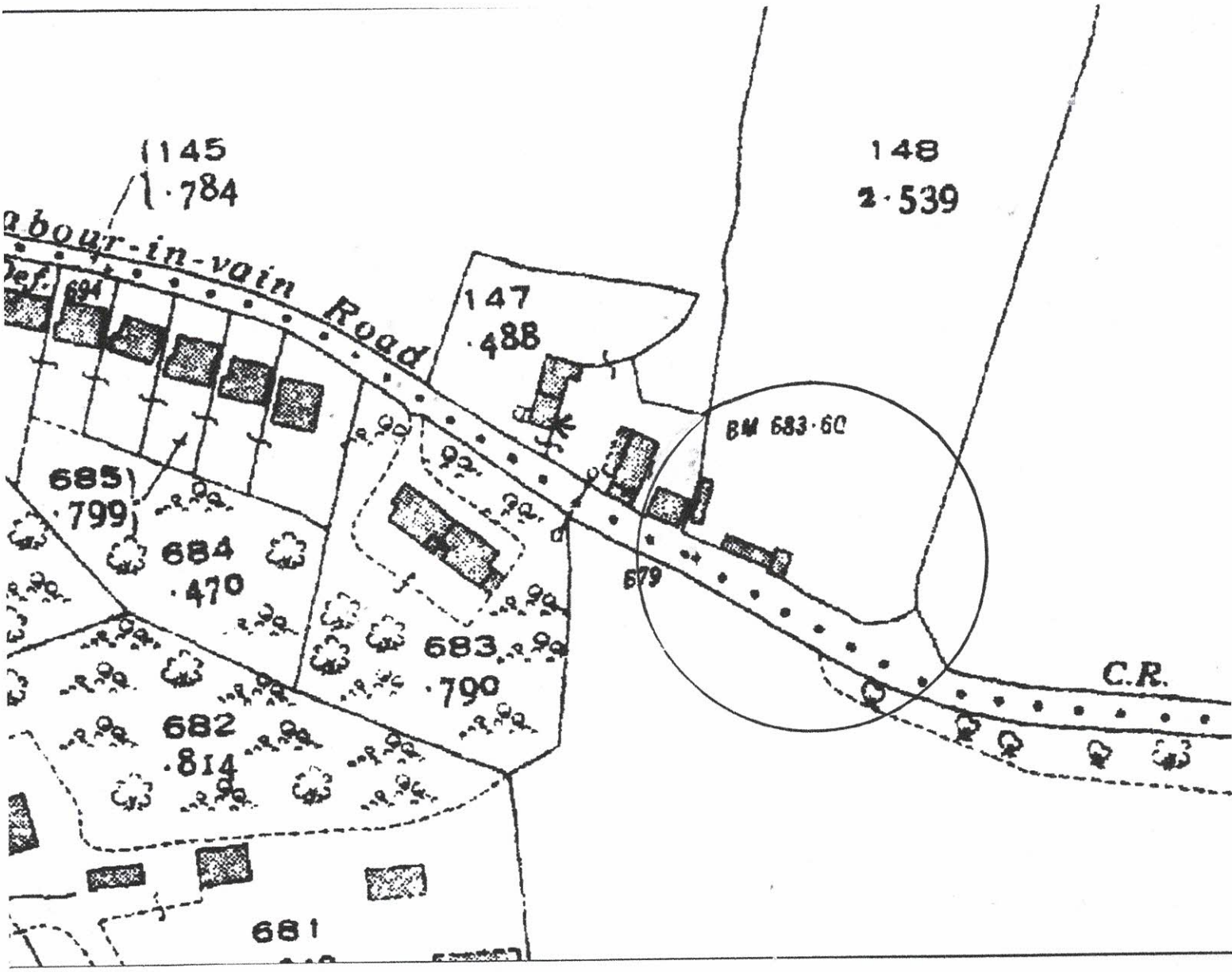
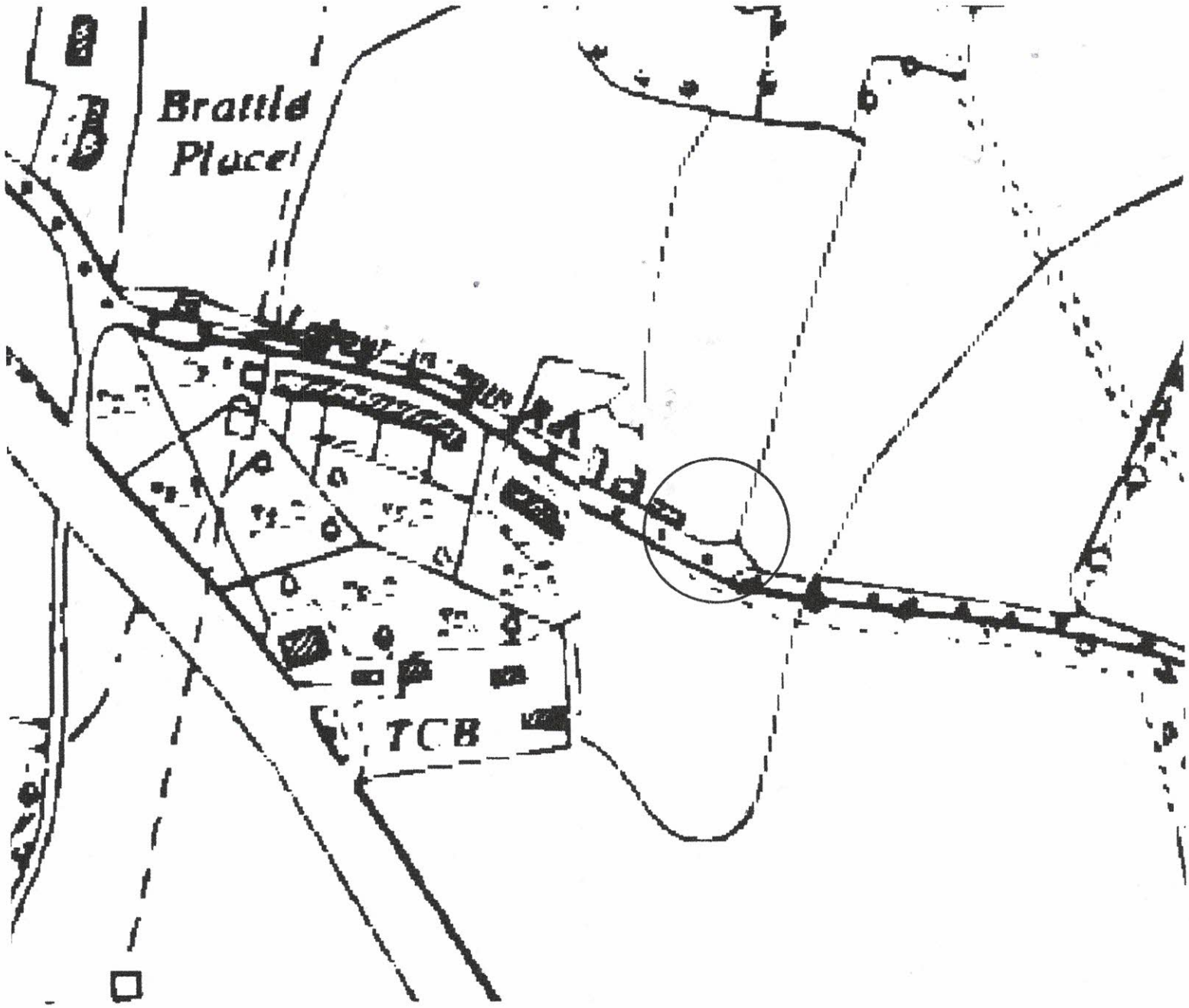


Land adjacent Finches Farm, Labour in Vain Road, Stansted. OS map scale 1:1250: 1907-1923.



Land adjacent Finches Farm, Labour in Vain Road, Stansted. OS map scale 1:1250: 1929-1952.



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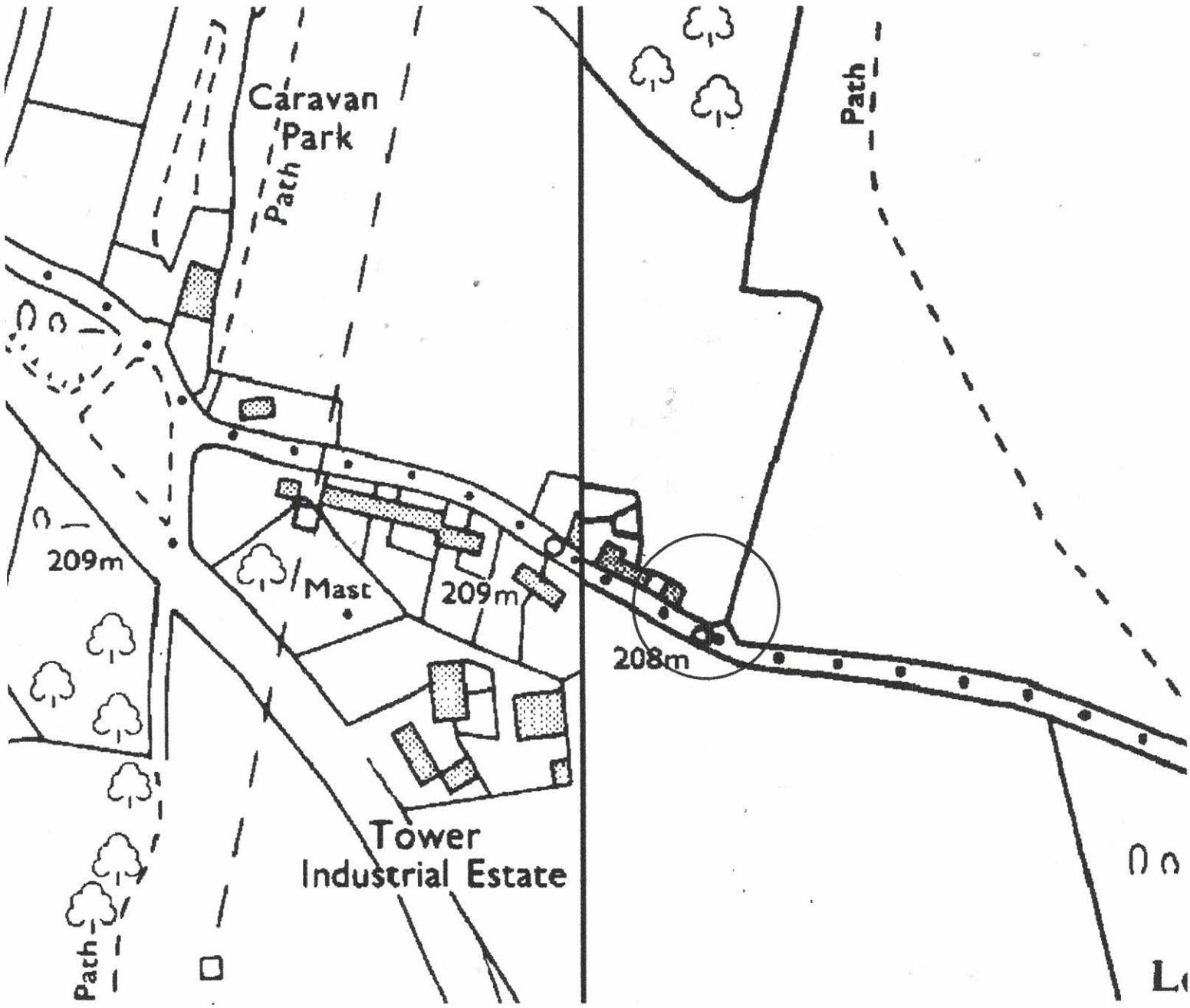

Land adjacent Finches Farm, Labour in Vain Road, Stansted. OS map scale 1:10000: 1978-1992.