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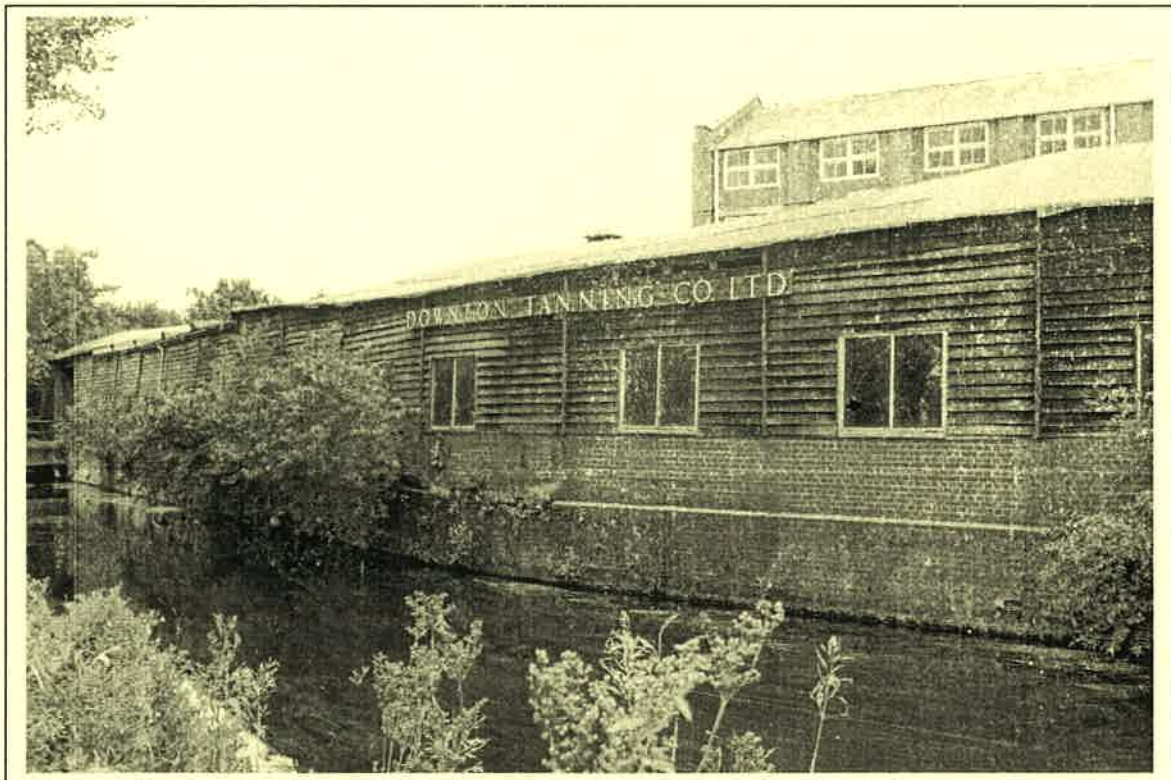
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Beechcroft Construction Ltd

# DOWNTON TANNERY, DOWNTON WILTSHIRE

BUILDING RECORDING AND  
INDUSTRIAL ARCHAEOLOGICAL RECORDING

NGR: SU 18002150



Oxford Archaeological Unit  
March 2001

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## BUILDING RECORDING AND INDUSTRIAL ARCHAEOLOGICAL RECORDING

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# DOWNTON TANNERY, DOWNTON, WILTSHIRE BUILDING RECORDING AND INDUSTRIAL ARCHAEOLOGY

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## EXECUTIVE SUMMARY

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Downton Tannery was constructed in the early 20<sup>th</sup> century as a relatively large, modern complex incorporating many of the new technical advances then being made in the tanning industry. It underwent some modernisation in the early decades of its existence, particularly the adoption of electric power, but it appears to have undergone relatively little significant investment in the second half of the 20<sup>th</sup> century. The tannery closed in 1998 and is currently being partially converted and partially demolished to allow for the construction of retirement flats. The lack of modernisation in the plant's later years resulted in it retaining many of its historic features; the fact that it was such a well preserved example of an early 20<sup>th</sup>-century tannery meant that planning permission for the redevelopment was only granted with the condition that a programme of building recording and industrial archaeology be undertaken prior to the start of the works. This was undertaken by the Oxford Archaeological Unit and is reported here.

The large site was bounded to the west by a mill stream and to the south by the High Street. The most prominent and architecturally impressive building on the site was a four-storied, L-shaped block at the southern end of the site which formed the main entrance to the tannery and housed, among other things, the company offices. This block had a slate-covered, gabled roof and was brick-built with stone dressings and had regular openings in a typical early 20<sup>th</sup>-century factory style. The southern range of the block, which fronted onto the High Street, is the only part of the development to be retained in the development. To the north and west of this block was a large, Belfast truss-roofed shed which housed the main tanning processes. To the north and east of this shed were various detached buildings and structures.

The well-preserved nature of the tannery meant that a good understanding of the functioning of the complex and of the operational flow through the site could be gained. The tanning process would start at the northern end of the shed where the hides would be stored in the hide shed. When ready they would be soaked to soften them and then limed in the lime pits within the northernmost third of the shed, to loosen the hair. Machines adjacent to the lime pits would then remove the hair and the flesh from the hides and they would be soaked to remove the lime. The hides would then be softened further in a solution which was traditionally pigeon or dogs dung and then the tanning itself would be undertaken in tan pits in the southern two-thirds of the covered shed. The final elements of the process would be the drying and dressing of the hides which would have been undertaken largely within the main L-shaped building and at the southern end of the covered shed. The transfer of the hides and other materials around the site would have been a largely manual operation even in the tannery's later phases. Several small trolleys were found both within the main tannery building and in the yard which would have had hides stacked on them and pulled between areas.

Among the many historic features surviving in-situ when the survey was undertaken was a water wheel, line shafting, cast iron columns with line shafting brackets, tanning and liming pits, the lime store, vats, rotating drums, and ducts and pipes within drying rooms.

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DOWNTON TANNERY, DOWNTON, WILTSHIRE  
BUILDING RECORDING AND INDUSTRIAL ARCHAEOLOGY

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*Summary*

Downton Tannery is a well preserved early 20<sup>th</sup>-century tannery complex which retains many of its original and historic features. The tannery ceased operations in 1998, having apparently been little modernised in its later decades and is currently being partially converted and partially demolished to allow the construction of retirement flats. A programme of building recording and industrial archaeological recording was undertaken by the Oxford Archaeological Unit prior to the start of the redevelopment. The two main components of the complex were a four-storey block which contained the offices and drying room and a large covered shed with Belfast-truss roof which housed the lime pits and tan yard. Among the many tannery features of interest which were still in-situ when the survey was undertaken were a wide variety of pits (including liming and tanning), vats, a water wheel, line shafting, rocker mechanisms and ducts within drying rooms.

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## **1 INTRODUCTION**

### **1.1 Background**

1.1.1 The Oxford Archaeological Unit (OAU) was commissioned by Beechcroft Construction Limited to undertake a programme of building recording and industrial archaeological recording at the tannery in the village of Downton, Wiltshire (centred at NGR: SU18002150). The buildings of the tannery complex are being partially converted and partially demolished to allow for the construction of residential units on the site. Due to the historic and architectural interest of the site planning permission for the development was granted with the condition that a programme of building recording was implemented prior to the start of demolition works. A specification for the programme of recording was issued by the OAU and this was approved by Helena Cave-Penney of Wiltshire County Council.

1.1.2 An archaeological watching brief was also undertaken during intrusive ground works at the site. The results of this will be reported separately.

### **1.2 Aims and objectives**

1.2.1 The overall aim of the project was to preserve by a visual record evidence of the tannery's structure, construction, development and use prior to its partial demolition.

1.2.2 The most interesting and significant features of the complex related more to the use of the buildings rather than to the building's intrinsic architectural interest and the recording reflected this, concentrating more on the interior of the complex than on its external shell. This was further reinforced by the fact that while the most architecturally impressive part of the complex was being retained in the development the internal structures relating to the tanning process were being removed.

### **1.3 Methodology**

- 1.3.1 The recording consisted of three main elements: a drawn survey, a photographic survey and a descriptive survey.
- 1.3.2 The drawn survey consisted of full plans of the structures at scale 1:100 and five internal sectional elevations taken through the complex at scales 1:100, 1:50 and 1:20. The plans were based on a surviving plan of the complex from 1943. The photographic survey consisted of a comprehensive 35mm survey (black and white prints and colour slides), both internal and external, of general shots and detailed features. It also consisted of medium and large format photographs of general internal and external views. The descriptive survey complemented the drawn survey and consisted of further notes. The site work was undertaken 21 August -1 September 2000.
- 1.3.3 No extensive programme of documentary research has been undertaken as part of this project; however, a limited number of sources were consulted to provide a background knowledge of the site and the tanning industry. A bibliography of the sources consulted is included at the end of this report.
- 1.3.4 The archive, consisting of the photographs, slides, negatives, site drawings, a copy of this report and further site notes will be deposited at the Wiltshire Buildings Record.

### **1.4 Details of development**

- 1.4.1 The site at Downton is being converted to residential accommodation. The only building being retained and converted in the development is the smaller east-west section of the L-shaped building (Block 1). All the other buildings and most of the structures are being removed and replaced. It is proposed to restore the waterwheel and retain it in its existing pit as a water feature. A brick culvert which passes beneath the site is also being partially retained in the development and the channel which it carries is being partially exposed as a feature.
- 1.4.2 At the time of writing this survey the exact details of the conversion of the frontage building had not been finalised and it is not known what specific impact the conversion will have on the retained building. The existing floor-to-ceiling heights are not ideally suited to a residential conversion consisting as they do of high ground floor ceilings and low ceilings on the upper floors, and it may be that significant changes to these will be made.

## **2 HISTORICAL BACKGROUND**

### **2.1 Downton village**

- 2.1.1 The village and parish of Downton are 6 miles south of Salisbury and is located adjacent to the River Avon. The village and immediate vicinity has a long history and evidence of pre-historic settlement has been identified (VCH). A Roman villa within the village has also been located and Downton appears to have been named in an Anglo Saxon charter of 672 AD. The village grew in the medieval and post medieval periods and retains a large number of historic buildings including two mills, formerly a paper mill and a grist mill, opposite the tannery. Tanning is known to have been undertaken in Downton for several centuries and a tanner is recorded as working in the village in 1736 (VCH).

## 2.2 Downton Tannery

- 2.2.1 The existing tannery at Downton dates to the early 20<sup>th</sup> century when it was constructed on the site of a large house similar in style to the Moot House which remains standing in the village today. There is however some dispute as to the exact date of its construction. The Victoria County History (Vol IV p236) states that it was constructed in 1919-20 for the newly-formed Southern Tanning Co Ltd but a recent contamination report (Aspen Burrow Croker, 1999: included as Appendix 1 within this report) states that there were two phases of construction: 1910 and 1919. The contamination report must have some validity because its historical background was based partly on discussions with a former managing director at the tannery. Archaeological evidence also suggests that, although the shed over tan-yard was probably constructed in 1919, the main buildings were earlier.
- 2.2.2 Power for the site originally appears to have been provided partially or entirely by a water wheel, which survives on site, but in 1929 the company invested in converting the plant to electric power. They purchased the former grist mill opposite the tannery and converted it to an electricity generating station which powered not only the tannery's operations but also provided electric power to most of the village. The Downton Electric Light Company was formed to operate the station and this continued to operate until 1973, having been nationalised in 1948. Possibly partially due to the major investment in the new electricity generating station the company failed in 1930 and the tannery was taken over by the Downton Tanning Company. They continued to operate the site until it was closed in 1998. (VCH)
- 2.2.3 The Victoria County History (1959) reports that sole leather for British shoe manufacturers had always been the main product of the tannery at Downton while the 1999 contamination report (based on the evidence of a managing director who had worked at the tannery for 36 years) only makes reference to the production of leather for making saddles, harnesses and other artefacts. It must therefore be assumed that the type of leather produced altered in the second half of the 20<sup>th</sup> century. The two documents both state that leather was produced from cattle hides mainly bought from auctions in England although some were also imported from South America and Canada.
- 2.2.4 A good indication of the layout of the tannery from the mid 20<sup>th</sup> century can be gained from a surviving ground floor plan of the plant dated 1943 (Fig. 10) which shows many similarities with the tannery in its final phase. The plan shows all the tan and lime pits and provides an indication for the function of each area of the building as well as specific types of machines and structural features. The plan also shows various additions and amendments made in the late 1940s and up to 1954.
- 2.2.5 The contamination report states that in its very earliest years an extract from oak bark was used as a tan but for most of its history natural vegetable extracts imported from South Africa were used. Chrome tanning was used in the 1980s in large wooden drums in addition to the natural tanning.

## 2.3 The tanning industry

- 2.3.1 To achieve a reasonable understanding of the buildings and structures at Downton it is important to have some understanding of the tanning process and the tanning industry generally. A summary of the process is therefore included here with particular reference where possible to the operations at Downton. The details of the process are largely taken from Adcock (1930) and Crockett (1921) and the exact processes at Downton may have differed somewhat from those described below.

2.3.2 Tanning is the process by which animal hides are converted into leather. It is a slow process with a number of distinct elements which have not altered fundamentally from pre-industrial times. It was traditionally a rural trade undertaken in relatively small complexes in villages or on the edges of larger towns with a high level of manual labour. This arrangement appears to have remained little changed until the late 19<sup>th</sup> and early 20<sup>th</sup> centuries when mechanisation and other principals of the industrial revolution were applied to the industry. The tendency which continued through the 20<sup>th</sup> century was for new tanneries to be on a industrial scale with a much larger productive capacity than the old plants and they were frequently located at ports to allow for the easy intake of hides and transport of finished leather. New machines and greater scientific knowledge accelerated various elements of the process and whereas in previous centuries the entire tanning process would take 2 years or more to complete by the early/mid 20<sup>th</sup> century it could take only a few months.

#### *The process*

2.3.3 When the hides (primarily or possibly entirely cattle hides at Downton) arrived at the tannery they would have been one of three sorts: either 'market' hides directly from the local market with no treatment applied (these appear to be the most commonly used at Downton), 'dried' hides (preserved through drying) or 'salted' hides (preserved through salting).

2.3.4 1). The first stage of the process was **soaking** the hides with soft water to soften them and remove blood, dung and other substances. For market hides this would take a few hours while for salted and dried hides this would take longer and may also use acid and alkaline solutions. In the 20<sup>th</sup> century the soaking may also have been undertaken in mechanical drums to assist the process but this does not appear to have been the case at Downton.

2.3.5 2). The second stage was **liming** which loosened the hair and the outer tissues of the hide. This was traditionally (and at Downton) undertaken in pits with various strength solutions. The hides were either gradually rotated between pits containing different solutions or remained in the same pit and had the solution in it gradually strengthened. By the early 20<sup>th</sup> century sharpening agents such as sodium sulphide were used as well as lime and at some tanneries no lime at all was used. It is apparent that lime was used at Downton and Aspen, Burrow and Croker's contamination report states that sodium sulphide was also used. In traditional tanneries hides would be left in lime pits for many months but in the period in which Downton Tannery was operating it appears to have been more usual to leave the hides in the pits for a week or two and sometimes as little as a few days. One of the techniques used to accelerate the process was to keep the lime solution at a warm temperature either by pumping warm water or hot air through pipes passing through the pits. The hides had to be regularly hauled during the liming to expose them to air and a variety of frames and chain structures were used. The pits frequently had sloped fronts on which the hides could be piled to drain. The heating pipes, hauling chains and sloped fronts were all present at Downton. Alternative methods which avoided the slow and inconvenient use of pits were sometimes employed in the 20<sup>th</sup> century such as painting the hides with a strong chemical solution and leaving them to hang. These methods do not appear to have been practised at Downton

2.3.6 3). The next stage was known as **unhairing** in which the material loosened by the liming was removed. Traditionally this was done using a two handed knife on a beam but by the early 20<sup>th</sup> century this was mechanised in more modern tanneries with unhairing machines. The machines essentially consisted of rotating cylinders



which pulled the hide through and over blades which removed the hair. There is known to have been an unhairing machine at Downton and an illustration of an unhairing machine from this period (not necessarily the same as that at Downton) is included as Plate 30.

- 2.3.7 **4). Fleshing** (removal of flesh) was another process which had traditionally been undertaken by hand but was mechanised in the early 20<sup>th</sup> century with fleshing machines similar in principal to unhairing machines. There is known to have been a fleshing machine at Downton and an illustration of a fleshing machine from this period (not necessarily the same as that at Downton) is included as Plate 33.
- 2.3.8 **5). Deliming** (removal of lime) was the next process and generally consisted of a further soaking. Various methods were used depending on the sort of leather being produced; it is known that at Downton a weak acid was used.
- 2.3.9 **6).** The next process was known as **Bating** by which hides were made supple. The hides would traditionally have been soaked in vats of birds or dogs dung but by the mid 20<sup>th</sup> century it was more common to use an artificial product again in vats. The hides were again washed after bating. The contamination report previously referred to (Appendix 1) suggests that at least in its later phases bating was not undertaken at Downton.
- 2.3.10 **7). Tanning** itself was the next process. Having been cut into sections ('rounded') the sections of hide (eg belly, butt, shoulder, cheeks) were soaked in pits containing tannin solutions of varying strengths. Oak bark was the most common traditional material used but various sorts of fruit, leaves shrubs and roots were all used and by the mid 20<sup>th</sup> century chrome salts were commonly used instead of, or as well as, natural tannin. There were a number of different types of pits the first of which was the *suspender* pits in which rounded hides would be hung, with care taken to ensure that they did not touch, principally in order to colour them. After about a week the rounded hides would transfer to the *handling* pits. In these the hides would be piled to compress them and would be gradually moved by hand from weaker solutions to stronger solutions. The next set of pits was sometimes known as the *layer* pits and again the hides graduated from weaker to stronger solutions. In mechanised tanneries systems of rockers were frequently used in the suspender pits which slowly raised and lowered the frames supporting the suspended hides in and out of the tanning solution.
- 2.3.11 **8). Drying** the tanned hides was the next process. Traditionally the hides would have been hung in covered open sheds and allowed to dry naturally but by the early 20<sup>th</sup> century techniques of artificially-accelerated drying such as using hot water pipes to raise the temperature in drying rooms and ducts circulating hot air were being employed. The sections of hide would be oiled before being dried then rolled several times during the drying process to remove scud.
- 2.3.12 **9). Dressing** the leather was the final element of the process. There were a wide variety of dressing processes employed in different tanneries but they included polishing, fluffing, dyeing, buffing, printing, embossing and waterproofing the leather. Many of these processes were mechanised and illustrations of some typical machines are included at the rear of this report as Plates 29 and 32. For example leather was stuffed into large rotating drums containing either dye or heavy grease.

### 3 DESCRIPTION

#### 3.1 Site description

3.1.1 Downton Tannery comprised a large complex of buildings bordered by a distributary of the River Avon to the west and by the High Street to the south (see Fig. 2). The main elements of the complex were:

- a four-storied, L-shaped frontage block (Block 1 and part of Block 2) which faced onto the High Street at the south end of the site and projected towards the north-west.
- A covered shed (Area 5) enclosed to the south and west by Block 1 and bordered to the west by the mill stream. Orientated NW-SE.
- A further covered shed (Areas 3 and 4) to the north of Block 1 and Area 5. It was a single space with Area 5 and was again bordered to west by the mill stream but it was orientated N-S.

3.1.2 There were also several other small extensions and detached buildings which are detailed below. Among these structures was an oxidisation plant, consisting of large concrete tanks, which was added towards the north end of the site. There was an open, un-covered yard to the east of the main building and deliveries of hides and the despatch of leather would have been from here via a gateway onto the High Street.

3.1.3 The large quantity of water needed for the tanning processes would have been supplied from a further distributary channel (distinct from that bordering the site) from the River Avon which passed beneath the tannery. It was a wide open channel known as the Barford Carrier which was enclosed as it entered the tannery from the north. The covered channel narrowed sharply and passed beneath the main tannery building (Block 2) as a brick culvert.

3.1.4 The structures covered within this study can be divided into two distinct groups: firstly the building themselves and secondly the features within the buildings which relate to the tanning processes (ie pits, line shafting etc). The buildings themselves were of somewhat limited architectural value. The main 4-storey, L-shaped block was an impressive and imposing structure, particularly Block 1 which faced the High Street, and the Belfast trussed roof which covered the yard was an interesting structure commonly used in large early 20<sup>th</sup>-century structures such as aircraft hangers. However, the main significance of the site lies in the group survival of a large proportion of the historic structures relating to the tanning process. This description section therefore starts with a description of the main building and then describes the other areas of the tannery in the order of their role in the tanning process.

#### 3.2 Block 1: South-west range of main building

##### *Introduction*

3.2.1 The most prominent and architecturally impressive building at the tannery was the four storied red brick-built structure at the southern end of the site (Block 1) which was orientated SW-NE and fronted onto the High Street. It formed the shorter wing of an L-shaped structure, the other wing of which (Block 2) projected to the north-west and was similarly constructed although with less architectural embellishment reflecting its less public position.

- 3.2.2 Although the two blocks were clearly of the same phase and date to the original construction of the tannery in the early 20<sup>th</sup> century for the sake of clarity within this study they have been divided into two separate blocks. The internal arrangement of the building is such that Block 1 abuts Block 2 although the south-east facade of Block 2 has been incorporated into the overall architectural composition of the south-east facade of Block 1.
- 3.2.3 Block 1 which is the only part of the tannery to be retained in the development, formed the main entrance to the complex and housed the company offices on the ground floor and drying rooms on the upper floors.

### *Exterior*

- 3.2.4 The **south elevation** (which includes the south end of Block 2) was 11 bays wide and had a tripartite design consisting of 3-bay wide slightly-projecting gables at each end. Each bay was divided by a projecting stone pier which supported the stone-faced gables and a stone entablature over the central 8-bay section. Each of the recessed panels was of brick and the floors were articulated by a concrete lintel. There was a large fan light with moulded brick surround within each gable. Each gable projected slightly above the slate roof behind. Each bay had round-headed tripartite windows at ground floor and square-headed 4-light windows at upper floor levels. Unfortunately when this survey was undertaken the southern elevation was covered in a thick ivy which obscured almost the entire elevation. It was not considered essential to remove this for the purposes of this survey because, as referred to previously, the South Range is the only part of the tannery being retained. There will also be a further opportunity to record the elevation during the archaeological watching brief phase of works (to be reported separately).
- 3.2.5 The **west elevation** was of a similar design as the south elevation. It was three bays wide with projecting stone piers supporting a stone gable. There was a fan light within the gable. The elevation was again largely covered with ivy when the survey was undertaken but it will be retained in the current development and recorded as part of the watching brief.
- 3.2.6 The **east end** of Block 1 abutted Block 2 and therefore had no external face.
- 3.2.7 The **north elevation** had 8 external bays other than at ground floor level which was entirely internal due to the adjoining covered shed (Block 5). That the elevation is less public than those facing onto the street is shown by the fact that the piers dividing the bays were of brick rather than stone and by the lack of gables. Again the floors were articulated by concrete lintels and the windows were a combination of four-light and two-light casements.

### *Interior*

- 3.2.8 The **ground floor** plan of Block 1 (Fig. 3) was divided by a N-S cross passage to the tan yard (Block 5) with load-bearing brick walls to either side and two trap doors in the floor above (Pl.20). The area to the west of this passage was divided into offices by light-weight and glazed partitions and there was an apparently primary staircase at the south-east corner of this area. The arrangement of offices was broadly similar to that shown on the 1943 plan but the offices had been extended eastwards into a former store area.

- 3.2.9 The area between the cross passage and the East Range was a single room (G17, Pl.5) which in 1943 was a warehouse. In this room there was a ceiling partly in-situ, above the principal rafter, but in some areas this had been removed to reveal E-W softwood common joists across much of the floor. Those at the south-west corner had been replaced by rolled steel joists. These were added to support a lift at first floor level (detailed below - 3.2.13).
- 3.2.10 The ground floor floor-to-ceiling height (3.9 m) was significantly greater than that of the first and second floors (2.25 m in each case); and the floor was supported by a spine of cast-iron columns. The columns were cast with *John Melbourne Limited Warrington* on the side and had two ogee flanges at the head on which the principal joists rest. There were four such columns to the west of the cross passage, each of which supported an I-section steel joist stamped *Cargo Fleet England* and there was a single column in the former warehouse to the east which supported a softwood principal joist.
- 3.2.11 The **upper floors** (first, second and third) of the South Range all had a very similar arrangement to each other. Each was divided by a brick cross wall (fire-break) into an open, six-bay long room to the west and a two-bay room adjacent to the East Range. Each had low floor-to-ceiling heights and appeared to have functioned as drying rooms. The internal wall surfaces were all of painted brick and the three windows on each floor, at the south-east end of the wing, were all above concrete block down to floor level.
- 3.2.12 The open room (F1) at the west end of the **first floor** (Fig.4) had two rows of square-section (15 x 15 cm) softwood pillars with load-spreading heads supporting softwood principal joists. The three pairs of pillars furthest west were 1.8 m apart, either side of the spine of the building, while the two pairs of pillars to the east of the room were 2.5 m apart. These two pillars were adjacent to the staircase and it could possibly be that the greater distance between them was to allow easier passage of wheel barrows or bulky items to and from the head of the stairs. The floor within F1 was covered by large, modern square boards which obscured any possible features relating to the use of the building (possibly such as imprints on the floor of hot air ducts.) There was a ceiling formed of large hard-boards but some had been removed to reveal softwood common joists (18 cm x 8 cm @ 39 cm centres). At the south-east corner of the room there was a hoist over the trap door immediately above the entrance to the building which was powered by an electric motor and operated by a drum and belt still in-situ. The windows within the room were all 4-light casements with a single central mullion, central horizontal pivots and timber lintels (internal face).
- 3.2.13 In the adjacent room (F2) there were two pillars of the same design as those in F1 and two further secondary pillars each of which is formed of a pair of softwood posts. Windows were similar to those recorded in F1. At the south-west corner of the room there was a rudimentary lift which would have utilised a fork-lift truck to raise an iron platform between first, second and third floors. The truck was set on the iron joists visible above G17 (see 3.2.9) and the lift was behind an expandable, sliding metal door.
- 3.2.14 The open room (S1) at the west end of the **second floor** (Fig.5) had two rows of pillars identical to those on the first floor but they were all 1.8 m apart. They supported N-S softwood principal joists (no ceiling). The floor consisted of narrow (probably primary) boards which were laid longitudinally to either side of the room and transversely (N-S) between the pillars to form a slightly raised walkway along the spine of the room. The room would have acted as a drying room and hides would have been hung from the joists on either side of the room. The drying would have

been assisted by hot air being pumped through a series of ducts and one of these survived along the north-eastern wall of the room beneath the windows. The duct was c.50 cm tall and ~~was enclosed by~~ hardboard boxing. At its east end it rose slightly and linked to an opening in the brick cross wall. At the south-east corner of the room there were two trapdoors and a simple pulley system attached to ropes from the floor above.

3.2.15 The adjacent room (S2) was similar to the corresponding room on the first floor. It had two square-section pillars towards the centre of the room, a further one to the south and an imprint on the floor confirmed that there was formerly a post in line to the north. The fork-lift truck referred to previously lifted an iron platform behind an expandable, sliding metal door between first and third floors.

3.2.16 The open room (T1) at the west end of the **third floor** (Fig.6) had a slightly raised walkway along the southern edge of the room formed of narrow boards laid across the main boards. There were five similarly-constructed walkways which projected northwards from the trunk walkway. There was a boxed duct along the northern wall of the room with an electric fan at its eastern end facing into the duct. The fan was adjacent to an opening in the window and there remained what appeared to have possibly been the curved metal top of an external duct. This may have taken hot air up to the third floor although there was a heating element in the fan and it may be simply that fresh air was blown through the heater and into the ducts. Regularly spaced openings in the vertical face of the duct suggest that there were formerly branch ducts projecting south from the trunk duct, directly beneath each of the trusses and in-between the walkways referred to previously. At the south-east corner of the room was a small opening in the floor through which a rope passed attached to a small pulley. The pulley was fixed to the floor structure itself and therefore the existing arrangement would not have allowed for the passage of materials up to the third floor at this point of the building.

3.2.17 The adjacent room (T2) had a void in the floor to allow for the fork-lift truck lift described above (3.2.9, 3.2.13).

3.2.18 The South Range retained its primary light-weight metal (probably steel) **roof**. There were six trusses, five above the western rooms, one above the eastern room with the full-height brick fire break in-between. Each truss consisted of two slightly-inclined ties rising to the underside of a central vertical member. There were two further verticals to each side and angled braces between them. Each truss was formed of rolled iron/steel of various sections and the members were bolted together. Right-angled brackets bolted to principal rafters supported four softwood purlins to each slope.

### 3.3 **Block 2: North-west wing of main building**

#### *Introduction*

3.3.1 Block 2 was the longer NW-SE wing of the main L-shaped tannery building towards the south end of the site. It was similar to Block 1 being four storeys tall, brick built and with a slate-covered gabled roof, but it was less ornamental than the frontage block. The ground floor of the wing was originally powered, shown by line-shafting brackets on the cast-iron columns and housed among other things the boiler house and machine shop while the upper floors appear to have been almost entirely made up of drying rooms. The building is abutted by the construction of the adjacent Belfast-trussed roof of Block 5 confirming that Block 1 pre-dates the roof of Block 5.

#### *Exterior*

- 3.3.2 The **east elevation** faced onto the open, uncovered yard and was similar to the north elevation of Block 1. It was ~~19 bays long~~ with each bay divided by a projecting brick pier. Each recessed panel consisted of brick beneath softwood-framed windows and concrete lintels. Most of the windows at the south end and towards the centre of the elevation had eight lights with a mullion and a transom while most of those towards the north end of the elevation had four horizontal lights with just a mullion. The southern end of the elevation was largely obscured by ivy when the survey was undertaken. A secondary metal silo adjoined the building at the 13th bay from the south and full-height ground and first floor openings had been created in the bay immediately to the north. These openings would presumably have allowed despatch of large crates (?) of leather directly to the yard.
- 3.3.3 The **north elevation** was enclosed at ground floor level by the covered yard (Area 3). It had relatively deep piers at each corner and two further shallower intermediate piers. These piers stepped-in at a shoulder at eaves height although there was a small pier directly above each which rose to a parapet at the head of the raised gable. The head of the gable is slightly corbelled and there was a circular window within the pediment. The elevation was entirely of brick, without any fenestration although there was a second floor fire escape.
- 3.3.5 The **west elevation** was enclosed at ground floor by the covered shed (Area 5). It was of very similar construction to the east elevation consisting of brick piers which divided the 16 external bays and brick recessed panels beneath 4- or 8-light windows.
- 3.3.6 The **south elevation** formed part of the High Street frontage and has therefore been included above in the external description of the Block 1.

#### *Interior*

- 3.3.7 The **plan** of each floor of Block 2 is divided by a series of full height brick cross walls. These create a six bay area at the south end, a 5 bay area at the north end and two four bay areas in the centre. There was a plain staircase towards the centre of the north-east wall.
- 3.3.8 At **ground floor** level there was a series of cast-iron columns along the spine of the building very similar to those on the ground floor of Block 1. The four at the south end (G18) of the building were identical to those in the South Range but the other 10 columns each had integral cast-iron brackets which would have supported line shafting (P1.6). The brackets were 2.95 m above floor and they projected by 48 cm from each column. The columns had the same flanges at the head supporting softwood principal joists (bolted through flange) and the columns were again cast with *John Melbourne Limited Warrington* on the side (although with a different design of name-plate). It was apparent that they had not supported line shafting for many years and it seems likely that the shafting was removed when the tannery adopted electric power in 1929. The 1943 plan of the tannery shows that the shafting had almost certainly been removed by that date as only one of the rooms (G21) had powered machinery at that time and these were powered by small individual electric motors. Each of the three main rooms towards the north-west of the wing (G20, G21, G22) had large windows to their south-west face which were internal due to the adjoining covered Tan Yard (Block 5).
- 3.3.9 **G18** was an open four-bay room at the south-east end of Block 2 with four cast iron columns along the central line of the room. At its north-western end there was a partially secondary brick wall, immediately to the north-west of the fourth column.

The lower 1.4 m of the wall appeared to have possibly been primary and a steel joist was set on top of this with later brickwork above up to first floor level. A secondary door to the uncovered yard ~~had been inserted~~ at the northern corner of the room and a former central door to the High Street had been blocked and converted to a window. The 1943 plan shows that at that time the room was a *Drying Room* and had a distinctive layout of ducts similar to that found in several rooms on the upper floors. A duct is shown to have extended along the south-west wall of the room and four tapered ducts projected into the room in line with each of the columns. There were also two trap doors indicated in the floor above but possible evidence for these, together with evidence for the former ducts on the floor, was not visible when the survey was undertaken, having been covered by a ceiling and a lino floor.

- 3.3.10 **G19** was a single space with the adjacent Tan Yard (Block 5) due to the removal of two bays of the south-west wall and the insertion of two steel joists (*Cargo Fleet England*). The 1943 plan shows that the room was formerly the *Boiler House* and at that time its north-east wall was inset c.1.5 m from the external wall. When the current survey was undertaken most of this wall had been removed. The floor above (other than the 1.5 m adjacent to the north-east wall) comprised a concrete slab supported by a network of steel joists, also stamped *Cargo Fleet, England*. There was a motor base and large drum within the room similar to an adjacent drum within the Tan Yard. Because these features relate to the tanning process they are detailed within the section below on the Tan Yard (see 3.6).
- 3.3.11 **G20** had three cast-iron columns with line shafting brackets, thus showing that the room was originally powered. However, as referred to above, the 1943 plan, which labels the room as a *Cessing Room*, appears to show that by that date the line shafting had been removed. There were also two further rows of posts also visible on the survey of 1943, consisting of two I-section steel posts, two wooden posts, and two plain circular-section cast iron posts.
- 3.3.12 **G21** had three cast iron columns with line shafting brackets and the 1943 plan shows that at that date it was a *Machine Room* with several electrically-powered machines (*Turner 149, Turner 280 and fixed head setter*). Turner is clearly the make of machine rather than a specific type of machine and illustrations of several other Turner machines are included at the end of this report as Plates 29 to 33.
- 3.3.13 **G22** again had four cast iron columns with line shafting brackets but is shown by the historic plan to have been in use as a *Drying Room* by 1943. At that date it had a distinctive arrangement of ducts similar to that in G18 but projecting from the north-east wall. The plan also shows that the Barford Carrier passed beneath the room as a brick culvert.
- 3.3.14 The arrangement of the **upper floors** in Block 2 was essentially similar on each floor (with some minor differences) and also similar to the upper floors of Block 1. The internal faces of the walls were of painted brick and each room had rows of square-section softwood pillars with load-spreading heads which supported softwood principal joists and lapped common joists. The rooms largely functioned as drying rooms and there was much evidence of this in the form of heating pipes, ducts, and hooks from which to hang hides.
- 3.3.15 **F3** was a four bay room at the south-east end of the **first floor** of the building created by the insertion of a secondary partition with sliding doors to the north-west. The floor above was supported by three pairs of pillars, the two to the north-west 2.2 m apart and that at the south-east end 1.7 m apart. The arrangement of pillars created a T-shaped walkway within the room and three adjacent areas, each of which housed

sets of heating pipes. The pipes were set just above the floor surface, within a protective grill, and consisted of two main rows along the external walls (SE and NE) and spurs projecting into the room. Secondary softwood battens supporting rows of plastic hooks were fixed to the underside of the primary joists from which hides would have been hung to dry.

- 3.3.16 **F4** was the 2-bay room which it is believed would originally have been a single room with F3. It was above the former boiler house and, other than at the north-eastern edge, had a secondary concrete floor supported from beneath by steel joists. The south-eastern section of the north-eastern part of the floor was covered by floor boards and the north-western section was formed of an iron plate. A double-height space had been created above the iron plate floor and a double loading door inserted in the external wall (Bay 6). Double doors had also been inserted into the adjacent Bay 5.
- 3.3.17 **F5** was the adjacent room and had been partially divided by a hard-board partition projecting half way into the room from the south-west wall. At the southern corner of the room were two parallel oil-stained timber bearers, c.4 m long with a cross member between which continued beneath and into the apparently-secondary cross wall.
- 3.3.18 **F6** was divided by a single central row of pillars along the spine of the room. The floor was covered by secondary boards thus obscuring possible evidence of former ducts. There was a walkway along the south-west side of the room which extended through an opening in the wall into the adjacent room.
- 3.3.19 **F7** was the five-bay room at the north-west end of Block 2 and it had five walkways projecting across the room from the main walkway along the south-west wall. Each walkway was formed of large covering boards leaving the original floor boards visible beneath. It is likely that systems of heating pipes would have projected across the room from the north-east wall, or possibly hot air ducts, in the areas between the walkways. Regularly-spaced holes in the underside of joists, into which hooks would have been fixed, confirmed that the room was used for dyeing.
- 3.3.20 **S3** was the room at the south-eastern end of the **second floor** of Block 2. It had a central walkway along the spine of the room, between two rows of timber pillars 1.6 m apart, created by laying large covering boards over the primary floorboards. There were two hardboard-clad ducts within the room, one against each of the main walls, both with 7 small vents in their vertical face. Hides would have been hung to dry from hooks attached to the underside of the common joists and many of these plain hooks remained in-situ within every other joist. At the northern corner of the room a double height loading space had been created with the floor below and boarded-off within S3.
- 3.3.21 **S4** had a single row of softwood pillars along the spine of the room and the floor had been covered by large secondary boards. There were small, regularly-spaced holes within the underside of every other joist showing evidence of hooks, similar to those in S3, from which hides would have been hung.
- 3.3.22 **S5** had a similar arrangement as the corresponding room at first floor with three pillars along the spine of the room. There was a slightly raised boarded walkway which extended along the south-west side of the room and a set of heater pipes similar to those within F3 in the main body of the room. The pipes, which were not enclosed by a protective cage (like those in F3), were arranged in sets of 4 and were located just above floor level. Sets of pipes extended along the north-east side of the



- room and across the room as far as the walkway in the northern 3 bays. There were again regular holes in the underside of every other joist providing evidence of former hooks.
- 3.3.23 **S6** also had a similar arrangement to the corresponding room at first floor with a row of four pillars along the spine of the room. The walkway extended from **S5** along the south-western side of the room and similar walkways branched off towards the north-east at the mid point of each bay.
- 3.3.24 The **roof** of Block 2 was of identical construction as that of Block 1 (see 3.2.18 above). There were five trusses above the south-eastern room (**T3**), four trusses above the north-western room (**T6**) and three trusses in each of the other two rooms (**T4** and **T5**).
- 3.3.25 **T3** was the six-bay room at the south-eastern end of the **third floor** of Block 2. There was an aluminium-clad duct along the north-east wall, beneath the windows and a large electric fan with integral heating element remained at the north-west end of the duct, adjacent to an opening in the external wall. Ducts would formerly have projected across the room from the main duct but these had been removed when the survey was undertaken. Walkways formed of narrow floorboards laid at right angles to the boards beneath were still in-situ and these would have projected north-eastwards, between each of the removed ducts, from a similar walkway along the south-western side of the room.
- 3.3.26 **T4** had a central walkway.
- 3.3.27 A hardboard walkway extended along the south-western side of **T5** and continued into **T6** though an opening and sliding door. No ducts survived within the room but distinctive imprints on the floor showed that there would originally have been a main duct along the north-east side of the room and three tapering ducts which projected across the room beneath each truss. Large secondary covering boards had been laid around and against the ducts so that when the ducts were removed the primary floor boards were visible beneath. The lift was enclosed at the south-east end of the room and the lift mechanism, powered by an electric motor, was situated above it.
- 3.3.28 **T6** was the five-bay room at the north-eastern end of Block 2. The large hardboard walkway continued along the south-west side of the room and there is a wooden-clad hot air duct along the north-east wall. A series of adjoining ducts would formerly have projected from the main, surviving duct directly beneath each roof truss. The former existence of the smaller ducts was shown by their imprint in the floor and by small openings in the vertical face of the main duct.

#### 3.4 **Block 3: Hide shed**

- 3.4.1 The hide shed was located at the north-east corner of the overall covered yard and was where hides which had recently arrived at the site would have been hung before starting the tanning process. It was a single space with (and immediately to the east of) the Lime Yard (Block 4). The roof formed a single-pitch extension to the arched Belfast truss roof over the adjacent yard. It consisted of 8 trusses formed with similar softwood lattices clamped between a pair of tie-beams and a pair of principals. The inner face of the roof covering was formed of boards with a felt cladding. Each truss was supported to the west by a simple softwood post extending to the floor and to the east by a similar post on a brick plinth. The floor of the hide shed is a concrete slab and spans directly over a 6.5 m wide brick culvert which carries the Barford Carrier

beneath the tannery. At the southern end of the hide shed the culvert is known to have narrowed to 2 m wide before passing beneath Block 2.

- 3.4.2 The recently-arrived hides would have been temporarily stored in the hide shed and there are therefore no specific features surviving relating directly to the tanning process. It is probable that the hides would have been wheeled into the shed on a cart and either left on the cart until ready to be processed or unloaded directly onto some now-removed units.

### 3.5 Block 4: Lime yard

- 3.5.1 The lime yard formed a single space with both the hide shed (Block 3) to the east and the main covered Tan Yard (Block 5) to the south. It was bordered to the west by the river but a bridge had been constructed over the river to allow access to the lime yard directly from the road.

- 3.5.2 The lime yard had a segmental-arch roof with nine Belfast trusses (16 -20 m long), the northern of which was immediately adjacent to the external wall and the southern of which was only a half truss as it abutted the NW gable end of Block 2. Each truss was formed by a softwood lattice clamped at its base by a pair of bolted tie-beams and at its head by a pair of curved members which formed the arch. Softwood rafters rested on the arch and supported a felt-covered boarded roof. Rows of posts supported the trusses at their mid-points and at either end. The western wall was immediately adjacent to the river and consisted of a brick retaining wall beneath a light-weight stud partition covered internally and externally by large boards.

- 3.5.3 The process of liming (detailed in section 2.3 above) was undertaken in pits in the lime yard. There were a total of 33 pits, all of which were shown on the 1943 plan, although some of them may have served other functions such as the initial soaking or deliming. The main set of lime pits was formed by two N-S rows, each of 11 pits, occupying almost the whole of the eastern half of the floor of Block 4.

- 3.5.4 The two rows of pits were divided by a central walkway and their profile was a mirror image of each other (see Fig.8). Each pit was c.3.5 m long by 1.5 m wide by 1.65 m deep at its deepest point. It had a sloped face adjacent to the walkway on which hides could be laid to drain which was continued by a vertical face to which was attached 6 pipes. Hot air or water would have been pumped through the pipes to warm the lime solution and thus accelerate the liming process. The base of the pits sloped gently away from the pipes and the opposite face of the pit was vertical. A feature of interest within each pit were two sets of chains, c.1 m apart from each other, set into each end face of the pit with 2 bars between them. These would have been used to regularly haul the hides out of the lime solution. The walls of the pits appeared to be constructed of brick although they had a thick, white lime encrustation. Many of the pits were covered by thick planks. There were five more pits adjoining to the south of the main rows of pits which also had sloped faces, pipes and chains.

- 3.5.5 To the west of the main pits was a row of five pits, each of a similar size to the lime pits but without a sloped face, iron pipes or chains. The walls again had a white encrustation and it may be that these pits were used for deliming.

- 3.5.6 At the north end of the lime yard was a projecting structure (4.5 m x 4.5 m) with a lean-to roof in which the lime was stored. The store was fully open to the lime yard and the three walls each consisted of a low brick wall, rendered internally, beneath

stud partitions. When the survey was undertaken there remained large amounts of powdered lime within the store.

- 3.5.7 Adjacent to the west wall of the lime yard was a large pit adjacent to a motor base which the historic plan shows was formerly a fleshing machine. At the south end of the lime yard was another pit with a concrete machine base which the plan shows was an electrically-powered unhairer.

### 3.6 Area 5: Tan yard

- 3.6.1 The tan yard, where the tanning operations themselves were undertaken, was a single-storey open plan shed (c.60 m x 24 m) with a Belfast-trussed roof, orientated NW-SE. It was enclosed to the south-east and north-east by Block 1 and to the south-west by the branch of the River Avon. The shed was of very similar construction to that enclosing the lime yard and consisted of 16 Belfast Trusses (c.24 m long, underside of tie c.3 m above floor) with a felt-covered board roof. The trusses were supported to their south-west end by softwood posts resting on a sole plate on brick dwarf wall. Towards the northern end of the tan yard this wall forms a retaining wall for the river. A simple stud partition is set on the wall covered on both faces with large boards, and incorporating regularly-spaced 2-light windows.

- 3.6.2 The NE end of the trusses were either supported on brick piers or posts against the SW face of Block 1. That the two structures were not integrated with each other confirms that the Belfast trussed-roof of Block 5 post-dates Block 1. There is a sprinkler system in the yard which is known to date to 1919 (see 3.7) and this is strongly believed to be primary to the roof over the tan yard.

- 3.6.3 The south-easternmost truss was c.4 m north-west from the rear of Block 1 and the arched roof ended at this point. The single bay between the arched roof and Block 1 had a secondary single pitch lean-to roof which awkwardly abutted the main tan yard structure. It is apparent that that the bay was originally left open to allow light into the ground floor rooms of Block 1 when the rest of Block 5 was constructed in 1919.

- 3.6.4 The tan yard was at the heart of the tannery both physically and in terms of the processes involved at the complex. The hides would remain in various pits in the yard for many months or even years and many structures and features relating to these processes remained in-situ when the current survey was undertaken. Nine distinct forms of pit have been identified within the tan yard and each set is laid out either side of a series of walkways within the yard. The pits survived almost entirely the same as those shown on the mid 20<sup>th</sup>-century plan.

- 3.6.5 **Pit type 1** was a set of 24 brick-lined pits (c.1.6 m<sup>3</sup>) towards the southern end of the tan yard arranged in three rows of eight pits. The historic plan of the yard shows that in the mid 20<sup>th</sup> century the western two rows of pits served as the *Shoulder Handler* pits, in which the shoulders would have been gradually rotated anti-clockwise from pit to pit and the eastern row of pits served as the *butt handlers*. The brick walls of the pits had been rendered and were further covered with encrustation. The eastern row of pits, (the *butt handlers*) had full-height wood-lined boxes to their two inner end faces which would have supported some form of a frame over the pit. The box was similar to those in pit type 8 which incorporated rockers but there is no shaft above pit 1. There were no such boxes in the western two rows of pits (*shoulder handlers*) but there were circular holes at the top of each end wall through which a short shaft would presumably have passed and there is a vertical recess down one face of each end wall. The pits contained various amounts of a brown liquid sludge; some pits being full and some almost empty.

- 3.6.6 **Pit type 2** was a set of pits adjacent to type 1 and consisted of two rows of 6 pits (1.5 m x 2.1 m). The historic plan shows that in the mid 20<sup>th</sup> century the pits functioned as the *Belly Handlers* and that there was a single overhead shaft which powered rocker arms in each row of pits which would have been similar to those in Pit Type 8. The rockers had been removed when the survey was undertaken and the pits had been converted to a different function.
- 3.6.7 The pits were constructed of brick and the row to the west had partially collapsed. There was a ledge 50 cm beneath the lip of each wall and above this a central, cut-off iron bar towards the top of each end wall which would have supported the rocker frame. A secondary wooden bearer had been built into the upper corners of each end wall (only some in-situ) into which a series of small hooks (c.11) had been fixed. These would have allowed sectioned hides to be suspended into the pit. The pits were fairly empty of residue except for that furthest south in the eastern row which was full of a brown liquid.
- 3.6.8 **Pit Type 3** was a set of pits at the western edge of the Tan Yard and the historic plan shows that at that time it was used as *Belly shot* (?) pits. There were two rows of five pits and the plan shows that the sectioned hides were moved from pit to pit in an anti-clockwise direction. There was relatively little encrustation on the brick pit walls and there was a wooden ledge around the top of the pits. Most of the pits were covered with large modern boards.
- 3.6.9 **Pit Type 4** was a set of pits towards the centre of the Tan Yard, on the west side of the spine walkway. The set consisted of four rows of eight pits and in the mid 20<sup>th</sup> century they were used as the *Butt bleach pits* although the historic plan shows that 10 of the pits were disused. Two of the pits at the southern end of the set were labelled as wash pits. The pits appeared to have been constructed of thick planks of wood set on top of each other with wider wooden bearers laid on top to form a platform to walk on. There was a thin residue on the walls.
- 3.6.10 **Pit Type 5** was a set of pits towards the southern end of the yard, on the eastern side of the main spine walkway. There were 5 pits, the top of which was flush with the main floor surface, each of which was covered over with large boards. The pits were very full of a noxious-looking liquid, thus largely obscuring their construction, but they appeared to be wood-lined and with an additional bearer along the spine.
- 3.6.11 **Pit Type 6** consisted of four upstanding boxes which are labelled as *extract dissolvers* on the historic plan.
- 3.6.12 **Pit Type 7** was a set of four rows of 12 pits each and in the mid 20<sup>th</sup> century they were used as *Butt circulator pits*. The pits were numbered on the historic plan and these suggest that the overall set of pits was divided into 3 groups of 16 pits in which butts were circulated. The inner faces of the pits were lined with wood and a wider softwood bearer was set on each of the walls to form a platform on which to walk across the pits. The pits had various levels of encrustation on the walls from heavy to moderate.
- 3.6.13 **Pit Type 8** was a set of pits towards the north-east corner of the Tan Yard and consisted of 3 rows of seven pits. The mid 20<sup>th</sup>-century plan shows that at that date the western row were belly suspenders, the central row were butt suspenders and the eastern row were shoulder suspenders. The pits were brick-lined and the two dividing walls along the pits were relatively wide (60 cm) to allow easy access to the pits and they had a brick-paved top. The most interesting features of the pits were the

largely-surviving rocker mechanisms which would have gently raised and lowered frames of rounded hides in and out of the tanning solution.

- 3.6.14 The rockers were powered by an electric motor set on a brick base, located to the west of the set of pits. A belt connected to the motor drove the main NW-SE power shaft, suspended from the Belfast trusses, which appears to have originally been powered by the water wheel (see below). A further belt transferred power to a system of wheels and cogs beneath the shaft to which was attached a long softwood connecting rod via a crank. The upper end of the connecting rod was hinged to one end of a long wooden pivot which was supported off-centre by a secondary shaft passing above the tie-beams of the trusses. A further angled connecting rod was hinged to the underside of the main pivot and was attached via a further hinged member to a rocker shaft supported beneath the trusses. Vertical rocker arms were attached via a crank to this shaft and provided power to each of the pits in the south-western row. Power was transferred to the central and north-eastern row of pits by a further pair of vertical arms hinged to a pivot supported by a further power shaft. A further set of connections transferred power to this shaft from the lower end of the main pivot mentioned above. Each vertical arm was hinged to one side of a four-sided wooded frame around the rim of each pit which was pivoted at each end of the pit and which would have gently raised and lowered each side.
- 3.6.15 The historic plan labels both of the secondary shafts as *new rocker shaft* (as opposed to the *main shaft*) which strongly suggests that the whole set of rockers was only installed in the 1940s although it may be that the new shafts were merely replacement shafts. Thus it is possible that the rockers were originally powered by the water wheel although it would appear unlikely that if shafts had been installed when the building was originally constructed that they would have required replacing by the 1940s.
- 3.6.16 **Pit type 9** was a set of two pits to the south-west of pit type 8 which was labelled on the 1943 plan as *new pits*. They were plain brick-lined pits with unrendered walls, upstanding partially above floor level, and with a small amount of residue within them.
- 3.6.17 A **water wheel** set within a brick-lined pit was located towards the mid-point of the south-western wall of the tan yard. The wheel would have been powered directly from the channel of the River Avon which passed to the west of the tannery and the flow would have been controlled by a small, counter-weighted sluice gate within the tannery's retaining wall. The wheel had a diameter of 3.12 m, it had six spokes, was cast in two parts, and had curved metal buckets supported by iron brackets slotted through the two rims of the wheel.
- 3.6.18 In its present arrangement the wheel would have acted as an undershot and would have been inefficient. This may have been of limited importance to the tannery because it would only have been required to power relatively gentle operations such as rocking frames in pits but from the form and construction of the wheel it appears that the wheel has been reused and was probably originally a 19<sup>th</sup>-century breast-shot wheel. Water entered the wheel pit at approximately the same height as the river level, there being no significant fall, and passed into a leat which carried water in a north-east direction to the main culvert beneath the tannery. The axle extended north-west from the wheel pit into an adjacent pit and supported a cogged wheel. A roller chain (like a bicycle chain) passed over the cogged wheel and transferred power vertically to a further two cogged wheels and a large belt wheel. A belt then transferred power to the south-east end of the main power shaft. The water wheel is to be retained in the redevelopment of the site as a water feature.

- 3.6.19 Towards the south-east corner of the tan yard was a large (c.2.5 m long, 2 m diameter) horizontal drum set on iron supports bolted to the floor. The drum is immediately adjacent to a large opening created in the outer wall of Block 2 and a further drum, very similar in size and construction, was immediately to the north-west, within G19 of Block 2. Each drum was formed of horizontal planks with six iron rod straps around them and there were electric motors and concrete bases adjacent to each which would have rotated the drums.
- 3.6.20 Rotating drums such as these were used for several elements of the tanning process such as greasing and dressing the hides towards the end of the process. It appears however, from the contamination report previously referred to (see Appendix \_\_) that these drums may have been used for tanning itself using artificial chrome tanning agents.
- 3.6.21 The 1943 plan shows that the drums must have been inserted into this area at some time after that date and from the fact that there are four drums shown elsewhere on the plan (one immediately to the north-west and three adjacent to Block 1) it seems probable that they were just relocated within the building. In 1943 the area contained the boiler (within Block 2) and the fuel bins and flue in the tan yard. The function of the large boiler was presumably to create hot air and water for the drying rooms and the contamination report previously referred to (Appendix \_\_) makes reference to a coal-fired boiler which was used at the tannery for many years.
- 3.6.22 None of the four other drums shown on the historic plan were in-situ when the current survey was undertaken but the three concrete motor bases of the drums adjacent to Block 1 remained in place and the timber-lined floor in the area was oil-stained.

### 3.7 Area 6: Compressor Room

- 3.7.1 At the southern corner of the tan yard was a small adjoining brick structure labelled on the 1943 plan as *Compressor Room*. Although the room was dominated by a large (9 m long) riveted, cylindrical compressor tank the feature of greatest interest was the system of valves and mechanics of the tannery's sprinkler system. The sprinkler system extended throughout the covered yard as well as on each floor of the main building and the operation of the system is detailed in a badly damaged framed illustration which was recovered from the room (Fig. 11). The illustration is titled *Arrangement of Hoffman's Alternative Sprinkler Valves for Wet and Dry Pipe Installations* and includes instructions for operating the system. The illustration is dated 20<sup>th</sup> February 1919, the year that it is believed the tan yard was covered over, strongly suggesting that the existing sprinkler system is primary to the tan yard.

### 3.8 Block 7

- 3.8.1 Adjacent to the hide shed is a single storey structure with a shallow, segmental arched roof, which was not shown on the historic plan (dated 1943 but with various amendments up to 1954). Its construction and style however would suggest that if it had genuinely not been constructed by then it must have been constructed soon after. The plan of the building is 26.5 m long by 7 m wide and the roof is supported by eight Belfast trusses the outer two of which are immediately adjacent to the ends of the building. Although the trusses in Block 7 are less than half the length of those over the main covered yard (Blocks 4 and 5) they are of similar construction with additional raking braces supporting the tie-beam. The trusses are supported at each end by softwood posts which rest on brick piers 90 cm above floor level. A brick

wall is continued around all four walls of the building at the height of the piers and this supports weatherboard-clad stud walls.

- 3.8.2 In its latest phase the plan of the building was divided in half by a simple wire mesh screen across the building approximately at its mid point. There were two wide openings in each main face of the northern half and one opening in the east wall of the southern half. The building was illuminated by a row of high-level windows on all four sides; those on the west side facilitated by the slightly higher walls of Block 7 than the hide shed (Block 3).
- 3.8.3 In the southern half of the building were two cylindrical vats constructed of vertical boards (c.3 cm thick) secured to each other by dowels and with the vats strapped by 6 iron/steel rods encircling them. Each vat was 1.75 m in diameter, 1.95 m tall and their bases rested 60 cm above the floor level on thick timber blocks. The southern vat was almost entirely intact but the northern one had largely collapsed thus exposing the encrusted base which had a similar raised profile to the base of a wine bottle (Pl.25). A raised metal platform 1.4 m above the floor had been constructed around the two vats to allow access to the interior of the vats.
- 3.8.4 Towards the centre of the room is a large cylindrical gas tank resting on two concrete piers and within the northern half of the room are four large concrete bases.
- 3.8.5 The building is not shown on the historic plan and the function of the vats is therefore not known for certain. Its location towards the northern end of the tannery would suggest that it was for an early, pre-tanning process, possibly such as bating (see 2.3.9) but the contamination report previously referred to (see Appendix 1) states that bating was not undertaken at Downton. The internal and external walls of the vats were partially coated in a light-coloured fatty residue and there was a strong fat/grease smell in the room. This may suggest that the vats served a post-tanning leather-dressing process.

### 3.9 Other structures.

- 3.9.1 A **fitters shop** (Block 8) was added adjoining Block 1 to the east. It was a brick-built lean-to with two rooms, the southern of which housed the principal machinery. The 1943 plan shows a lathe within the room and when this survey was undertaken the small electric motor and section of line-shaft remained in-situ.
- 3.9.2 A **lavatory block** (Block 9) was added against the east wall of the East Range in 1945. It was a single-storied, brick-built lean-to.
- 3.9.3 A detached, single-storey building (Block 10) with a concrete portal frame and light-weight corrugated panel-covered roof was located to the east of Block 7, adjacent to the church yard. The structure was divided by several concrete block cross-walls and was open to the south.
- 3.9.4 Block 11 was a further mid 20<sup>th</sup>-century single storey covered storage shed and was located in a step in the eastern side of the site plan. The main block consisted of two portal frame sheds forming an M-shaped roof with a central valley. The walls were clad in light-weight translucent panelling. To the south of the main block was a smaller, similarly-constructed block, also with a shallow-pitch portal roof.
- 3.9.5 To the north of the main tannery buildings, forming a partially-enclosed triangular-shaped yard with Blocks 7 and 10 was a small open-fronted shed with single pitch roof (Block 12).

- 3.9.6 To the north of Block 12 was the oxidation plant (Block 13) which was constructed to purify the toxic waste products used at the tannery. The plant consisted a several large concrete tanks and purifying mechanisms the largest of which was had rounded ends to form the shape of a running track.
- 3.9.7 A **canteen** is shown on the 1943 plan adjacent to the fitters shop but this had been removed by the time of this survey. The plan shows that the canteen was a *Nissen hut* and it would therefore have been a semi-cylindrical corrugated-iron hut.
- 3.9.8 A large painted brick house survives facing the tannery on the opposite side of the High Street (outside the current development site) which was almost certainly also constructed as part of the early 20<sup>th</sup>-century tannery development and is called *Tannery House*.

#### 4 CONCLUSION

- 4.1.1 When the current survey was undertaken the tannery at Downton was a remarkably well-preserved example of an early 20<sup>th</sup>-century tannery complex. The main buildings all date to the first half of the 20<sup>th</sup> century although the complex did develop in several phases and the main four storey tannery building pre-dates the Belfast-truss roofed tan yard. It appears that the main building was constructed in c.1910 and the covered tan yard added in 1919. The tannery was constructed in a period in which mechanisation and other modern techniques were being applied to the tanning industry and the complex combined elements of both the traditional tannery, such as its location and the large modern tannery complex operating on an industrial scale.
- 4.1.2 The fact that the plant had been little modernised in its later decades may have contributed to its demise but it also meant that the site retained a large number of its original and historic features. These included a water wheel, line shafting, cast iron columns (some with line-shafting brackets), tanning and liming pits, a lime store, vats, rotating drums, ducts and pipes within drying rooms and an early sprinkler system.
- 4.1.3 Despite technical advances in the industry which had substantially accelerated the process from its pre-industrial age tanning would still have been a relatively slow process at Downton and the transfer of materials around the site would have been largely manual. A good impression of the flow of the hides through the complex can be gained with the early stages of the process towards the north and the later stages towards the south. The final drying and dressing of the hides would have been largely undertaken within the main building and they would have been transferred from the building through a large loading bay on the east side of Block 2. Other evidence of transfer of materials around the site included sets of trapdoors within each floor immediately above the main entrance with a rotative drum and electric motor.
- 4.1.4 The current archaeological programme was almost entirely limited to recording the physical remains of the tannery prior to their removal and there remains several areas of potential for further research. Historical research has not been formally undertaken although a limited number of sources have been consulted. Cartographic sources would shed some light on the development of the complex and it is probable that there survives a company archive from which the 1943 plan used in this report is taken. Of particular potential in a site such as this in which the complex has shut down relatively recently, is oral history. Many former tannery employees must no



doubt still live locally and a project to record their memories and experiences would add significantly to the understanding and record of the tannery. Further information relating to the tannery will also be gained from the archaeological watching brief currently being undertaken. The results of this work will be reported separately.

Jonathan Gill  
Oxford Archaeological Unit  
March 2001

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Downton Tannery: Part of Contamination Investigation Report F4292/R4 March 1999 by Aspen Burrow Croker

## **4.0 THE DESK STUDY INVESTIGATION AND FINDINGS**

### **4.1 History**

The following information was mostly obtained from conversations with Mr Andrew Lunt who has worked at the tannery for 36 years, latterly as Managing Director, but is also supported by our independent research. This gives us a high degree of confidence concerning the post 1910 operation but information prior to that must be considered less reliable.

There has been a tannery on the site for about 400 years but the present main tannery buildings were built in 1910 and 1919. As far as is known the tannery has only ever used cattle hides as raw stock. Sheep and pig skins have never been used.

The cattle hides have almost all been used for making saddles and harnesses and other artefacts which need the same kind of leather.

Up until the first world war the tan used was an extract from oak bark and since then the tans have been mostly natural vegetable extracts principally extracts of mimosa bark imported from South Africa. In the eighties chrome based tanning took place in addition to the harmless vegetable based tans and it is thought that trivalent chromium residues were placed as waste in the pond area in the north end of the site. The chrome tanning took place in large rotating wooden drums and not in the tanks built into the ground.

Most of the hides processed at the plant originated from the U.K but in the past some were imported from South America and Canada but none from Africa or elsewhere.

Waste lime from the unhairing process was thought to have been used on the site to build up the river banks. Also, a coal fired boiler was used in the tannery for many years and the ashes were used to build up ground levels in the yard and car park area where it is thought to be more than one metre thick in many places.

Upstream of the site a local landowner has built a very large trout farm in which water from the Avon is diverted into fish ponds and then allowed to flow back into the river. This has caused some pollution of the water for which the tannery has been wrongly blamed.

Section 4.2 deals with the tanning processes known to have been used after 1910. It is thought that the earlier processes were largely based on the oak bark tanning but other activities cannot be ruled out.

### **4.2 Tanning Process**

#### **4.2.1 Pre-tanning Operations**

The pre-tanning operations prepared the hide for tanning by the removal of tissue and hair.

The hides were soaked in water and disinfectant to remove blood, dung, curing salt and soluble proteins. At other tanneries degreasing using white spirit or kerosene was undertaken but not at Downton as far as is known.

Fat and extraneous tissue were removed mechanically and then rendered on the site.

The hair was removed by soaking the hides in lime and sodium sulphide. The residue waste from this process is potentially one of the most contaminating substances on the site since up to the time the oxidation ditch purifying plant was built much of it was dumped into the former pond at the north end of the property. It has the potential of forming hydrogen sulphide, a gas which is both toxic and has the foul smell of rotten eggs.

At other tanneries arsenic sulphides were used to remove hairs but this process was not used at Downton as far as is known.

After the hair had been removed the hides were soaked in weak acid to adjust the pH.

A process called bating in which enzyme was used to remove hair remnants was not used at Downton.

#### 4.2.2 Tanning

Tanning was carried out mostly by submerging the hides in the pits but some were placed in rotating wooden drums. As stated in section 4.1 the substances used were vegetable tans obtained from tree bark and for some years trivalent chromium sulphate was used in addition but this was in the rotating drums only. The vegetable tans are harmless but trivalent chromium is potentially toxic if present in large quantities. It is thought that waste containing it could have been dumped in the pond area.

Other tanning processes using fish oil and formaldehyde were not thought to have been carried out.

#### 4.2.3 Post Tanning

Surface coatings applied by pad or sprayed using a dispersion in water consisted of dyes or pigments dispersed in binders such as casein, acrylic polymer or polyurethane.

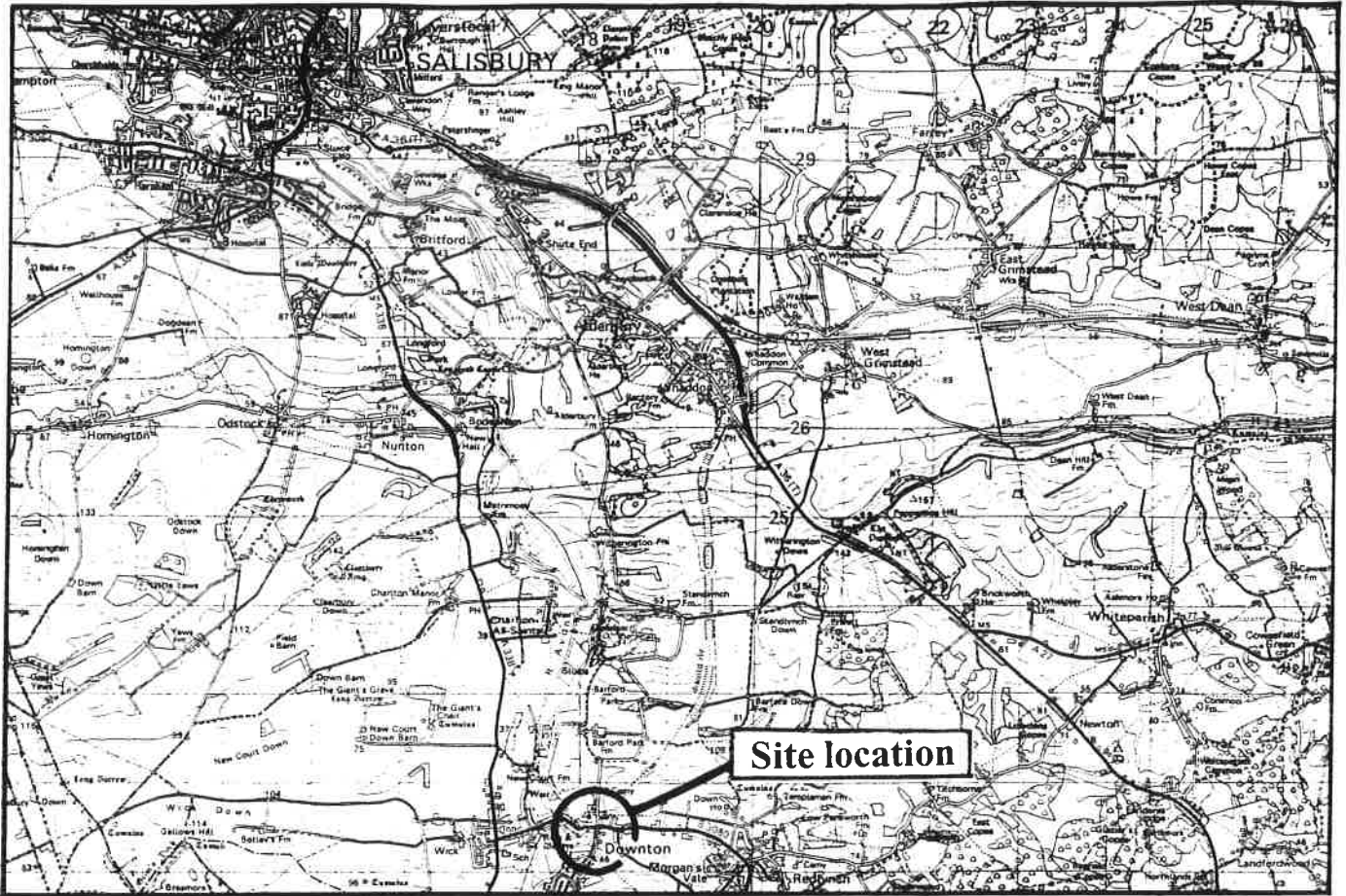
### 4.3 Contamination of the Buildings

Part of the brief is to consider the potential for contamination of the buildings and the implications of such contamination for the potential re-use of the buildings for residential (or other) purposes.

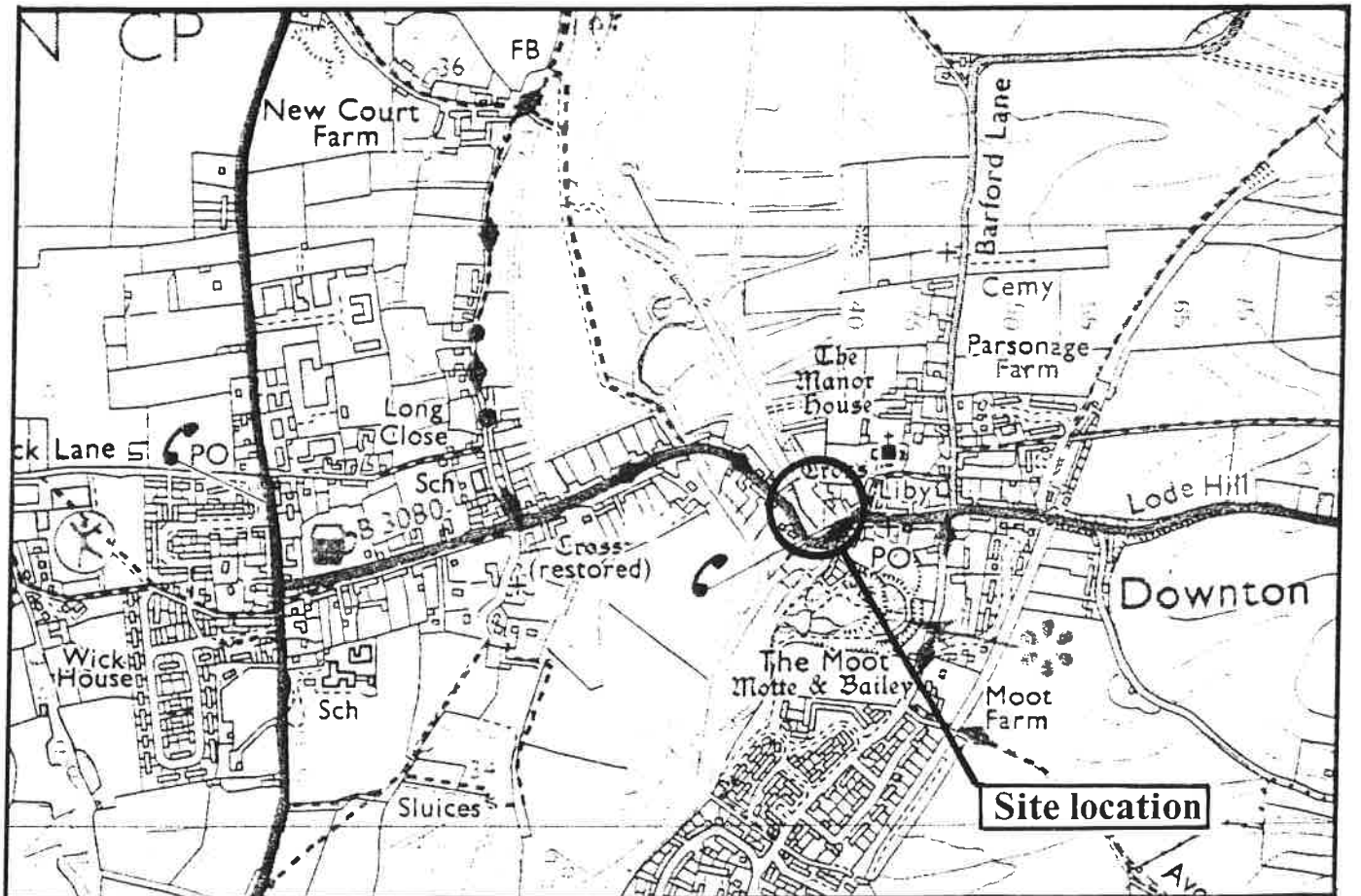
Contamination, if any, is likely to be on the surfaces of the ground floor and the pits and also in the ground under these. Spillages of the unhairing chemicals and the trivalent chromium tans could be anywhere on the floors or lower parts of the ground floor walls and could be present on the pit surfaces. The coal burning boiler could have leaked tars onto and possibly through the floor in the boiler room.

Contaminants under the floors and pit bottoms will have to be considered from the point of view of being potentially contaminating to the ground and ground water, and also as being possibly harmful to workmen constructing new foundations, drains etc.

The upper floors of the main buildings were used for drying only. Hides were taken there on drying racks transported by trolleys. These ran on sheets of plywood placed on the floors to protect them and so all drips from the hides fell on the sheets which will be removed. Few drips fell on the structural floors.



Site location



Site location

Figure 1: Site location

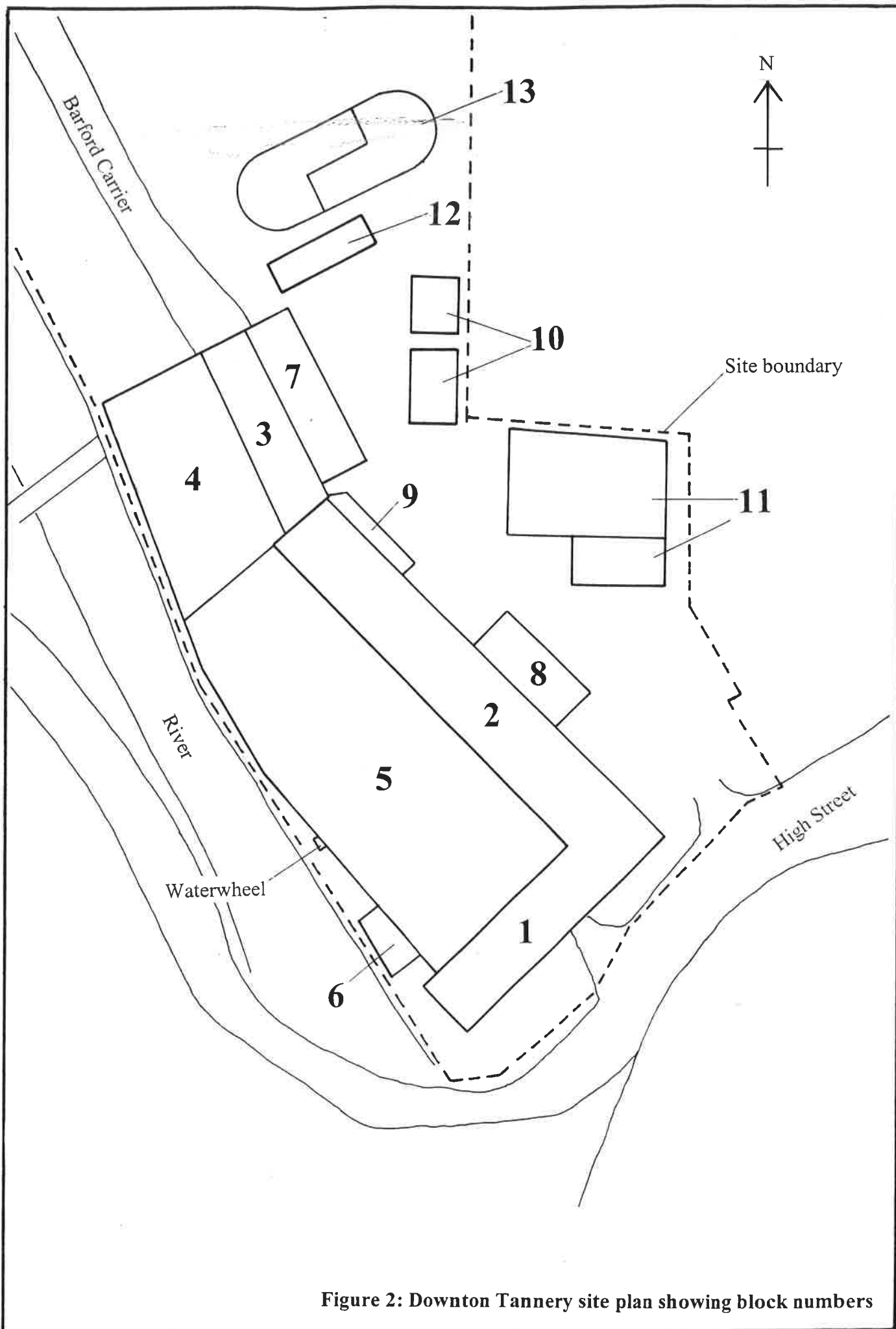
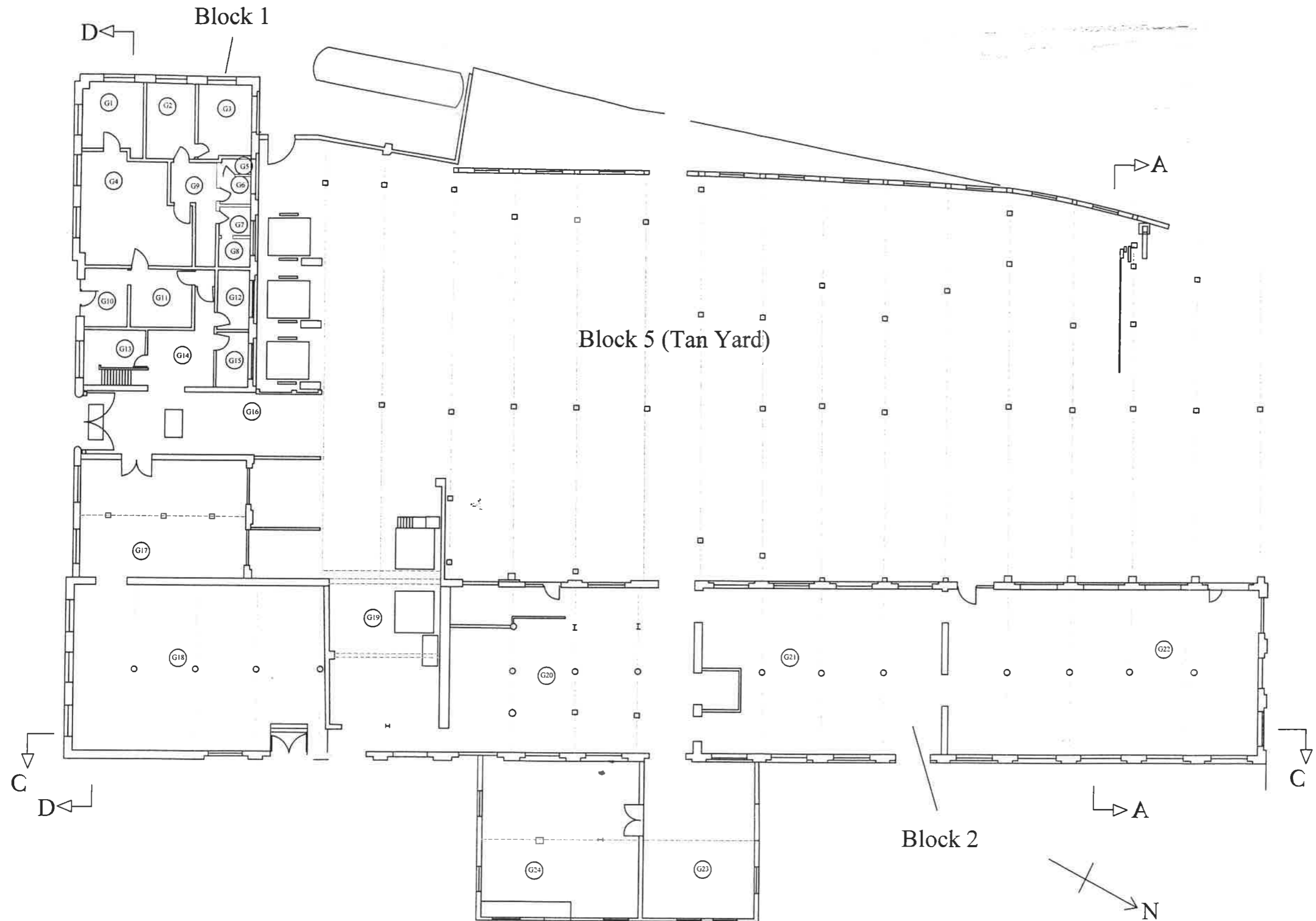


Figure 2: Downton Tannery site plan showing block numbers



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Scale at A3

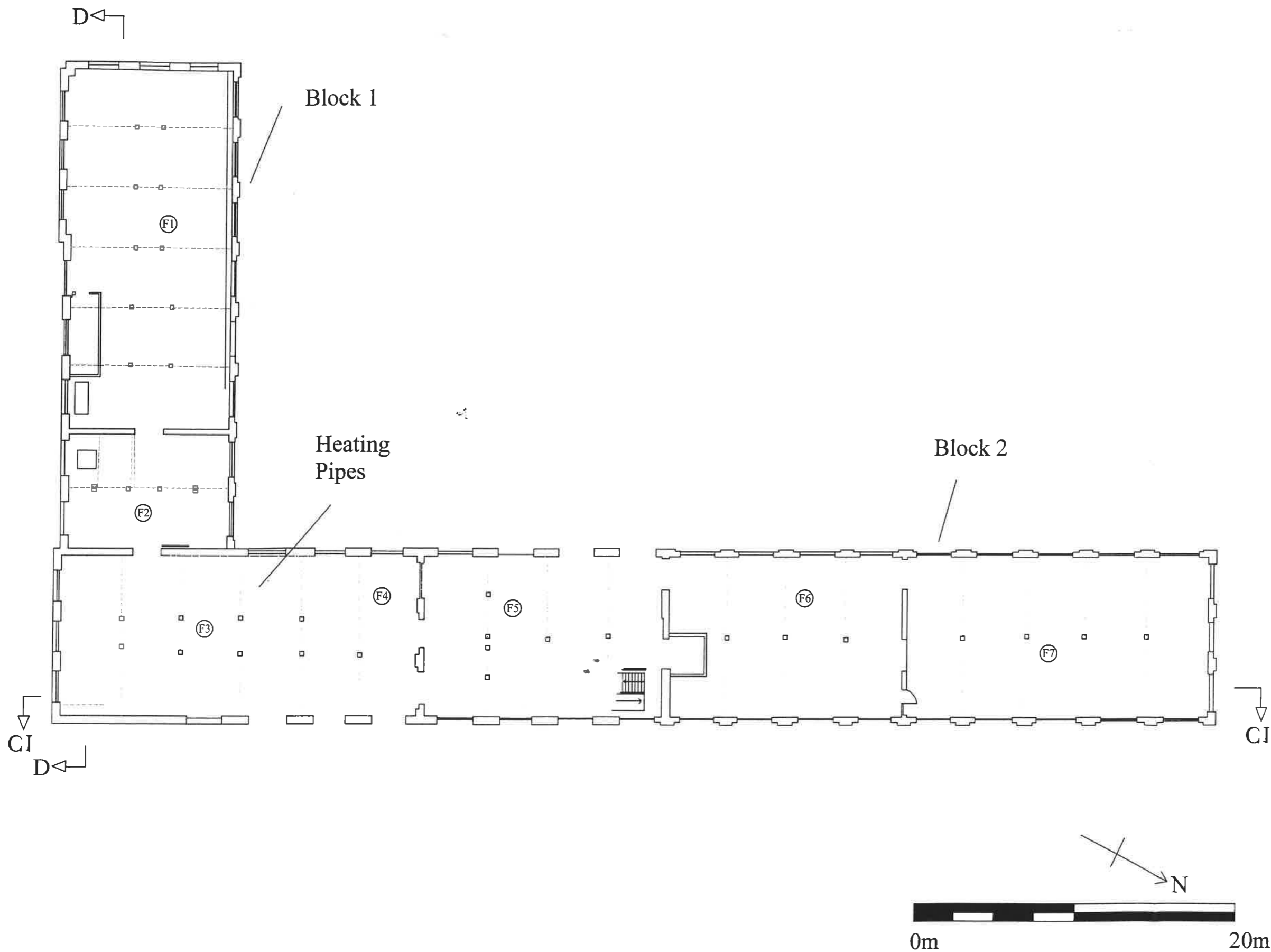
Figure 3

Drawing  
No.

1:250

Ground Floor  
Plan

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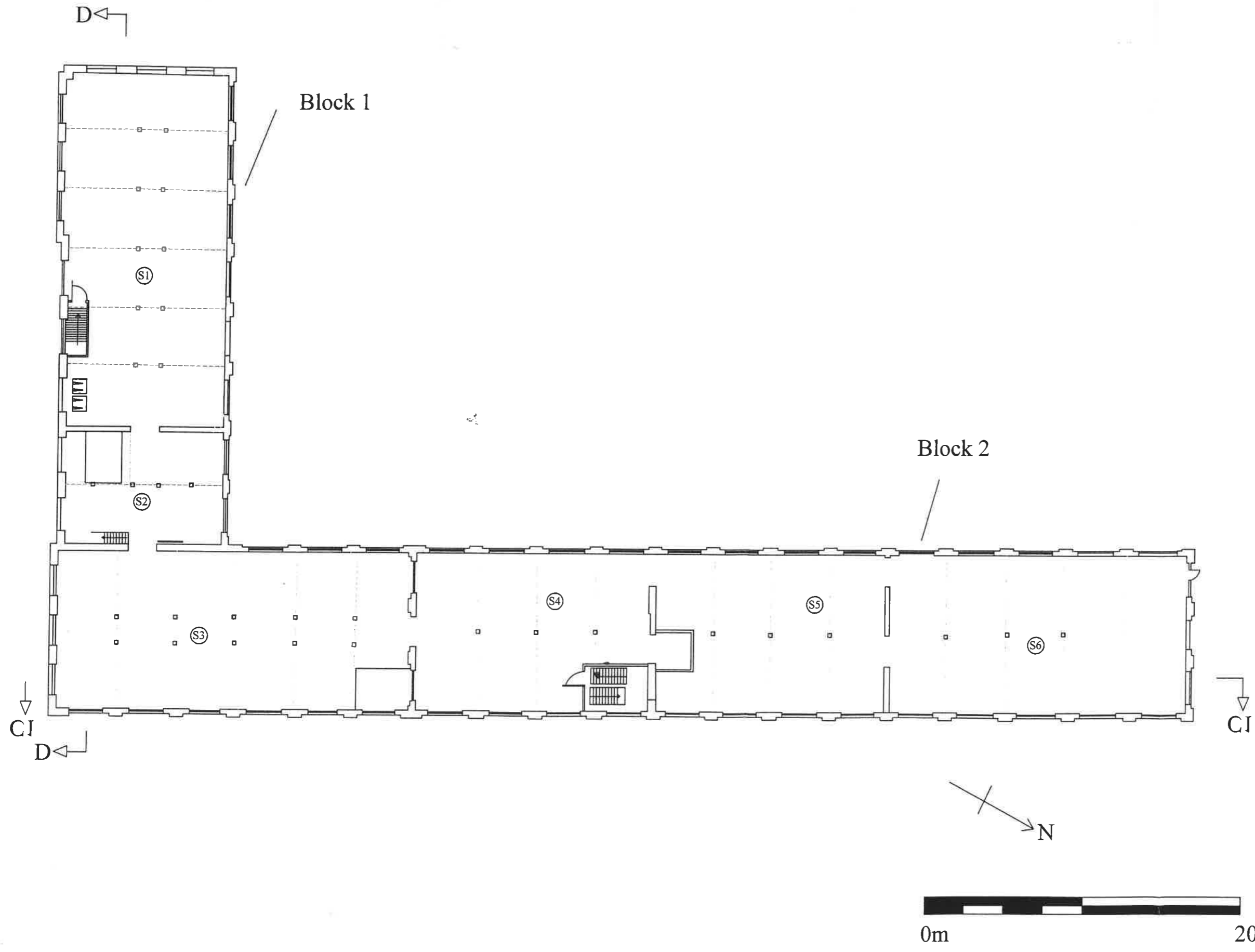


Drawing No.	Figure 4
Scale at A3	1:250

**Blocks  
 1 and 2 : First  
 Floor Plan**

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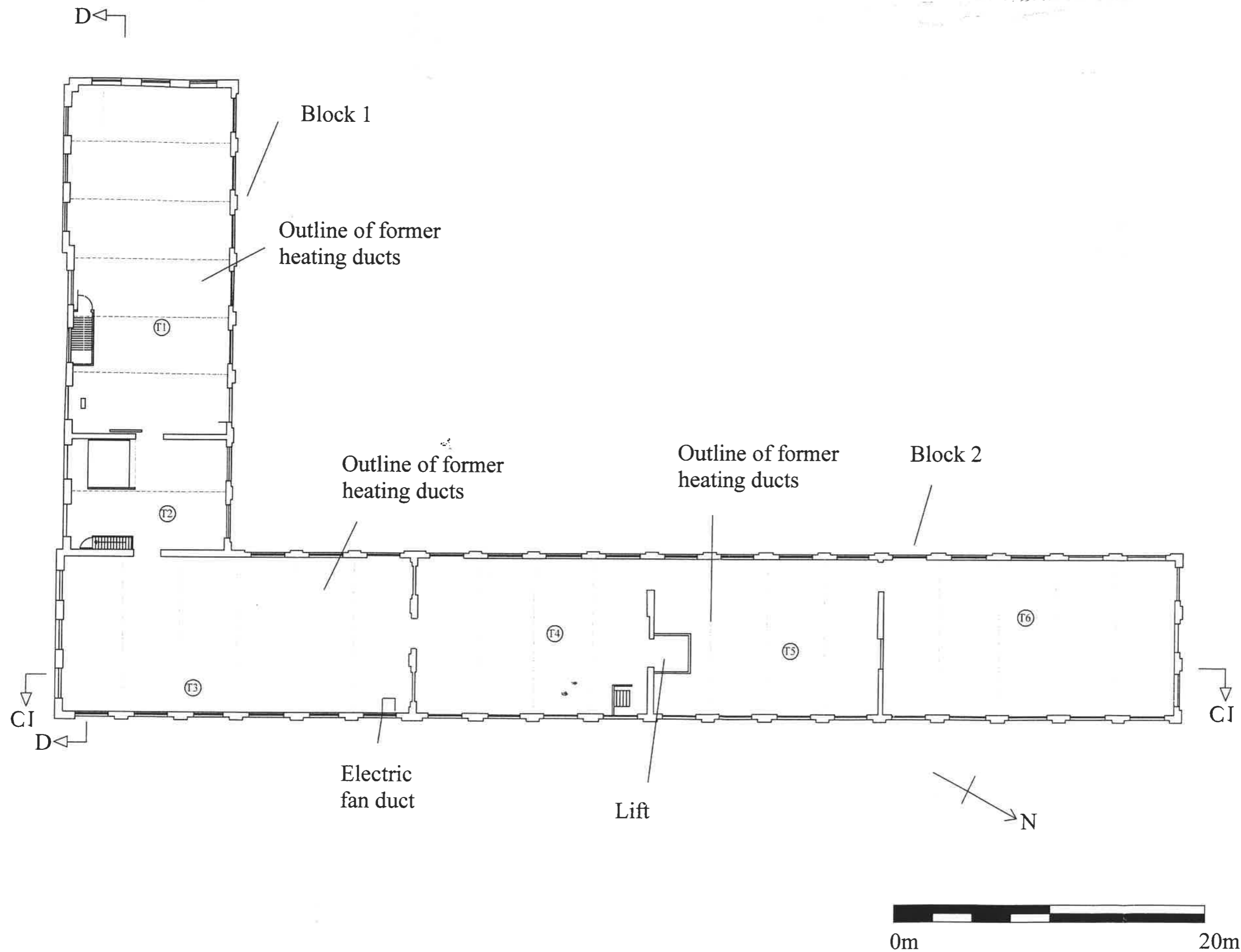
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Drawing No.	Figure 5
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## Blocks 1 and 2 : Second Floor Plan

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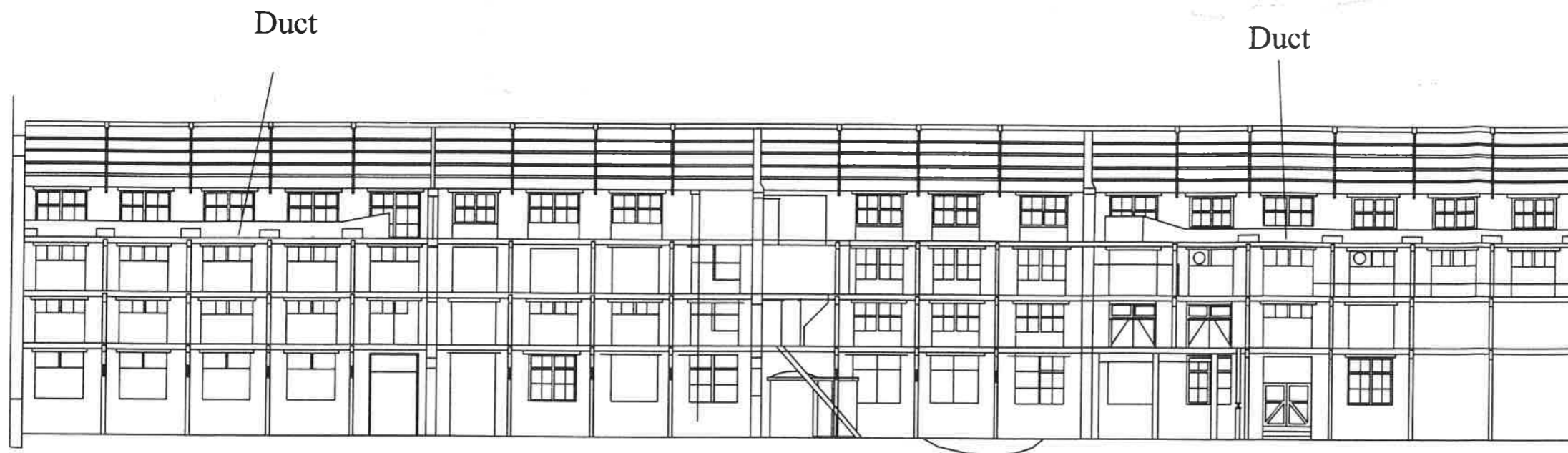
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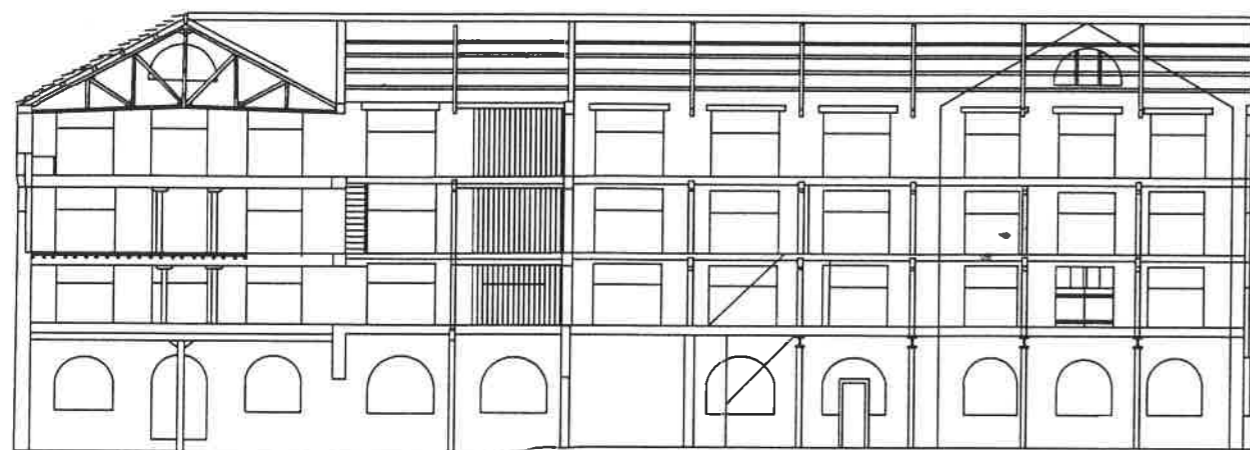
Drawing No.	Figure 6
Scale at A3	1:250

### Blocks 1 and 2 : Third Floor Plan

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Section Through Block 2 Looking North East



Section Through Block 1 Looking South East



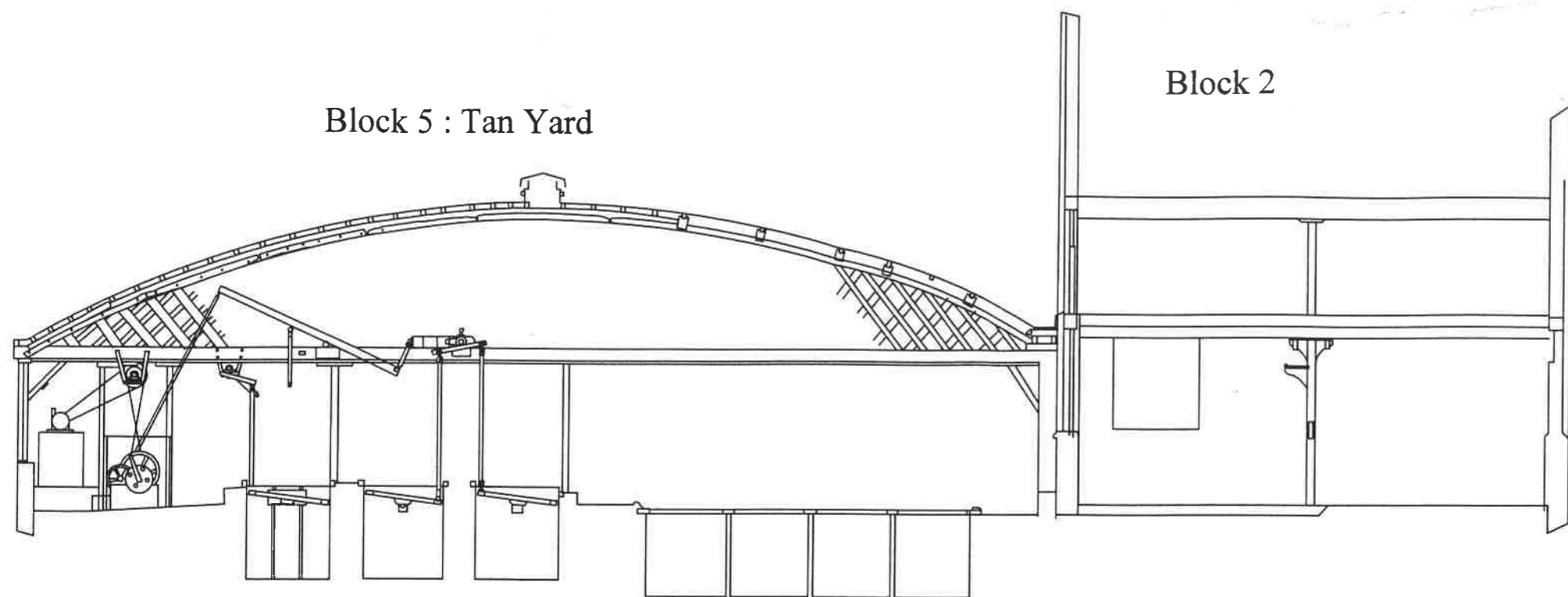
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Drawing No.	Figure 7
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**Internal Sectional  
Elevation**

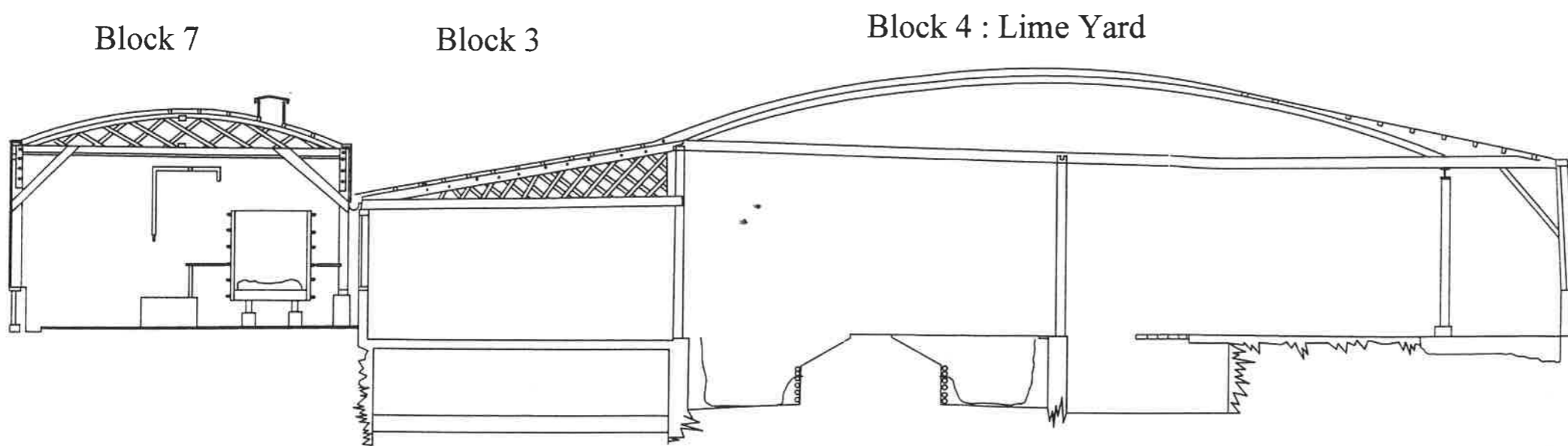
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Block 5 : Tan Yard

Block 2

Section A - A Looking North



Block 7

Block 3

Block 4 : Lime Yard

Section B-B Looking South

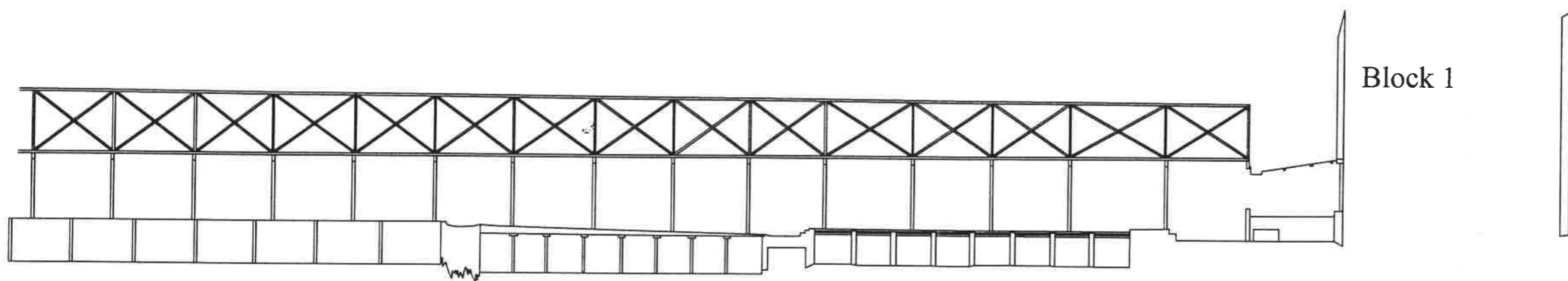


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Drawing No.	Figure 8
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### Sections Through Tannery



Block 5 : Tan Yard

Block 1



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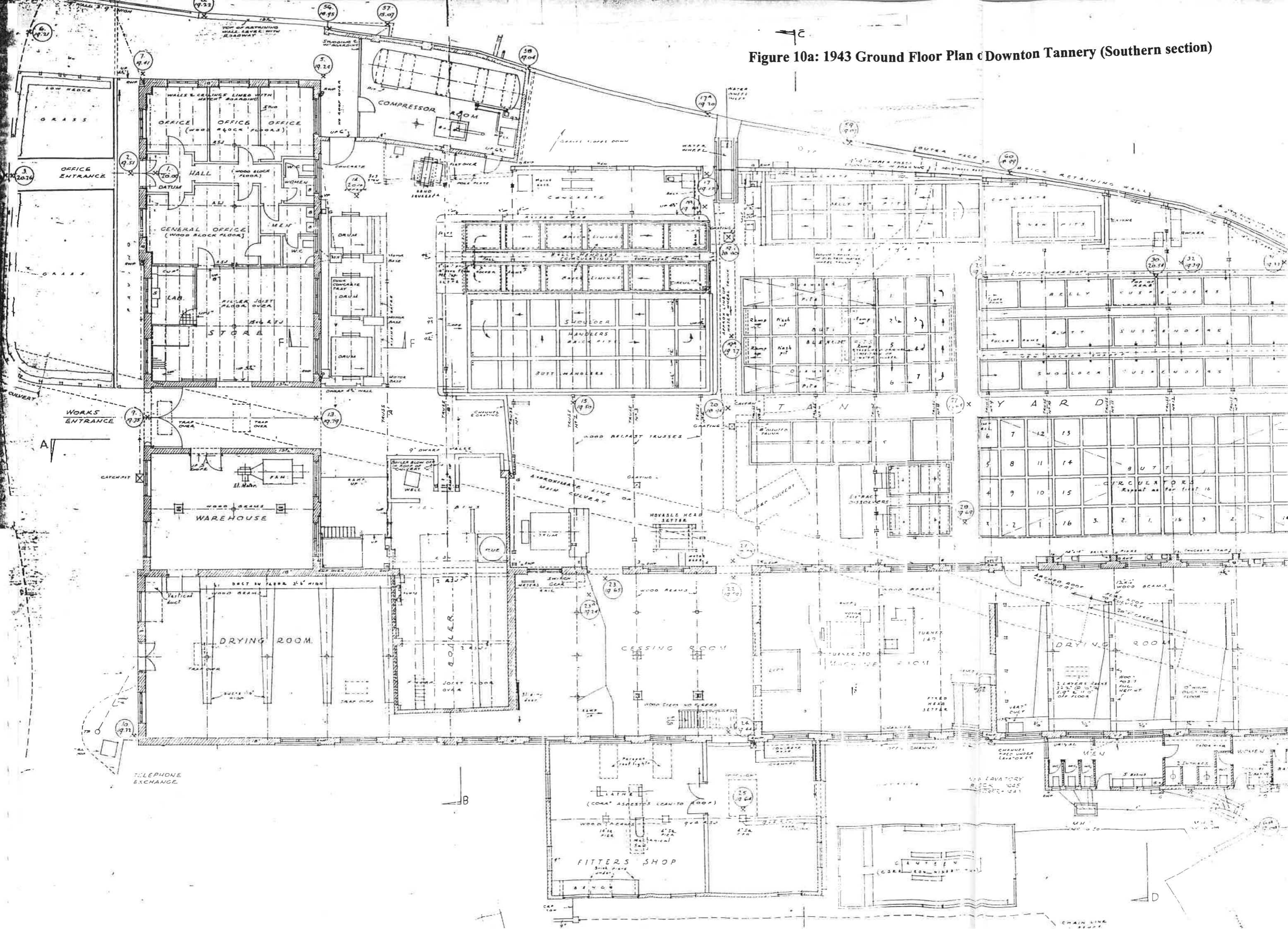


Drawing No.	Figure 9
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Long Section  
Through Tan  
Yard

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Figure 10a: 1943 Ground Floor Plan of Downton Tannery (Southern section)



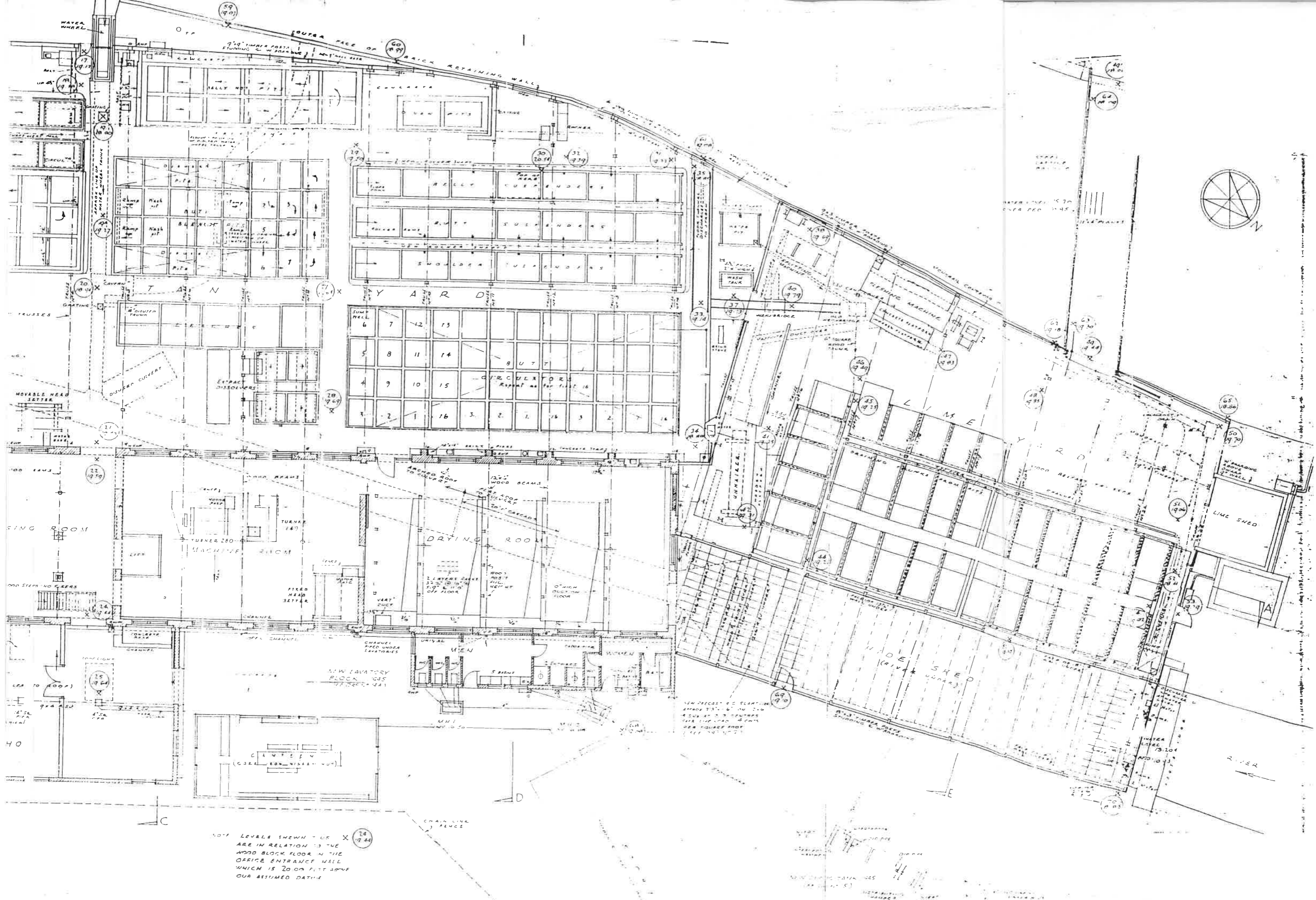
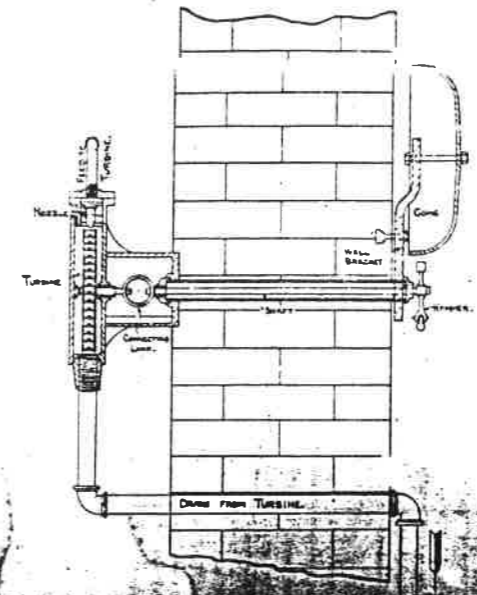
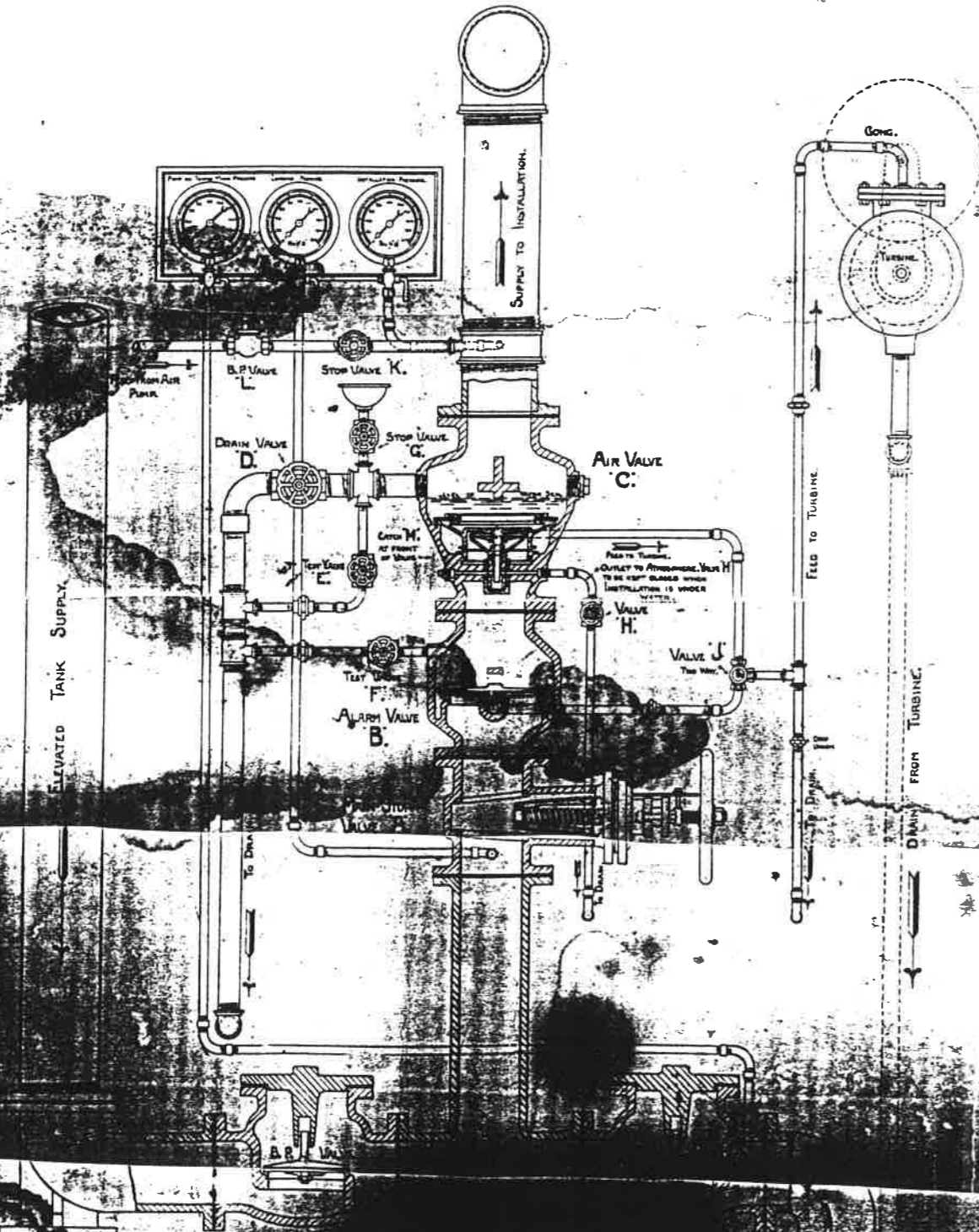


Figure 10b: 1943 Ground Floor Plan of Downton Tannery (Northern section)

# ARRANGEMENT OF HOFFMANN'S ALTERNATE SPRINKLER VALVES

## FOR

# WET & DRY PIPE INSTALLATIONS



HOFFMANN SPRINKLER CO. LTD  
- MANCHESTER -

- GENERAL INSTRUCTIONS**
- TO CONVERT INSTALLATION FROM WET TO DRY SYSTEM -
1. SHUT MAIN STOP VALVE A
  2. OPEN DRAIN VALVE D AND ALL DRAIN VALVES CONNECTED TO INSTALLATION. (THEN CLOSE AIR VALVE C)
  3. WHEN ALL THE WATER HAS BEEN DRAINED ALL ON ONE SIDE THROUGH THE VALVE SEATS, PLACE A WOODEN PLUG IN THE OPENING OF THE AIR VALVE C. THEN THE WATER WILL BE KEPT BELOW VALVE C TO FALL ON THE SEATING & REPLACE THE PLUG.
  4. THE STOP VALVE J CONTROLLING FEED TO TURBINE MUST BE OPEN TO AIR VALVE C. (THIS)
  5. OPEN VALVE G & POUR WATER THROUGH TURBINE TO FORM A WATER SEAL ON AIR VALVE UNTIL LEVEL WITH DRAIN VALVE D. THEN CLOSE VALVE G.
  6. OPEN VALVE K CONTROLLING FEED FROM AIR PUMP & PUMP WATER INTO INSTALLATION.
  7. VALVE H TO BE STRAPPED OPEN & THE PIPE TO BE USED AS A DRAIN TO ATMOSPHERE. (STILL TAKE BETWEEN VALVE SEATS.)
  8. CLOSE VALVE K & GENTLY OPEN MAIN STOP VALVE A.
  9. TO TEST THE GONG WHEN INSTALLATION IS SHUT OFF, OPEN VALVE J. (THIS WILL BE OPEN TO ALARM VALVE B.)
- TO CONVERT FROM DRY TO WET SYSTEM -
1. SHUT MAIN STOP VALVE A
  2. OPEN VALVE J CONTROLLING FEED TO TURBINE
  3. OPEN VALVE K CONTROLLING FEED FROM AIR PUMP & PUMP WATER INTO INSTALLATION
  4. OPEN VALVE G & POUR WATER THROUGH TURBINE TO FORM A WATER SEAL ON AIR VALVE UNTIL LEVEL WITH DRAIN VALVE D. THEN CLOSE VALVE G.
  5. OPEN VALVE H TO BE STRAPPED OPEN & THE PIPE TO BE USED AS A DRAIN TO ATMOSPHERE. (STILL TAKE BETWEEN VALVE SEATS.)
  6. CLOSE VALVE J CONTROLLING FEED TO TURBINE
  7. OPEN VALVE A

Figure 11: Sprinkler system at Downton Tannery (dated 20 Feb 1919)



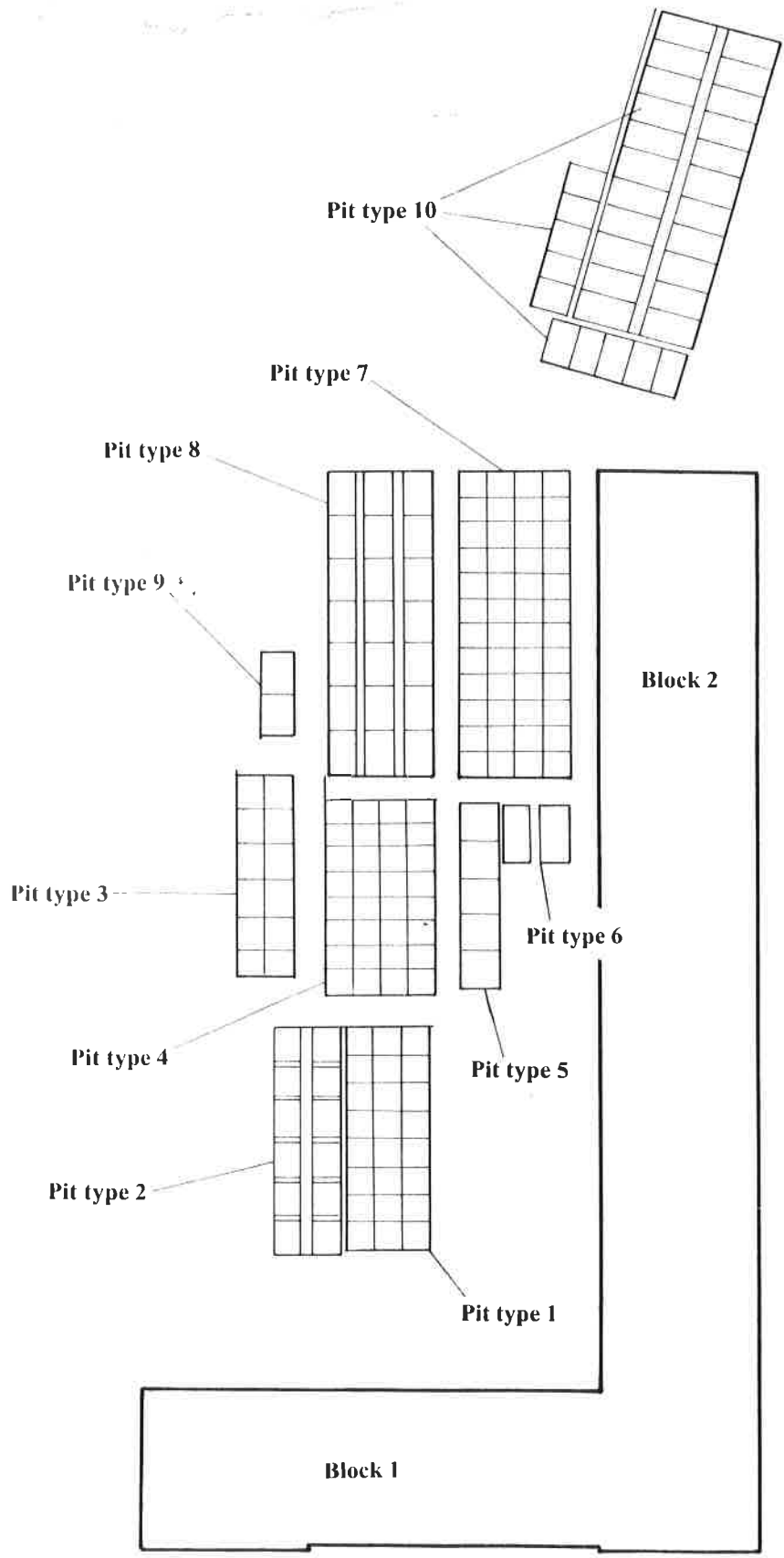


Figure 12: location of pits in tan yard and lime yard



Plate 1: View of tannery from west. Waterwheel and sluice gate visible towards left.  
Plate 2: View of northern end of tannery from south-west.

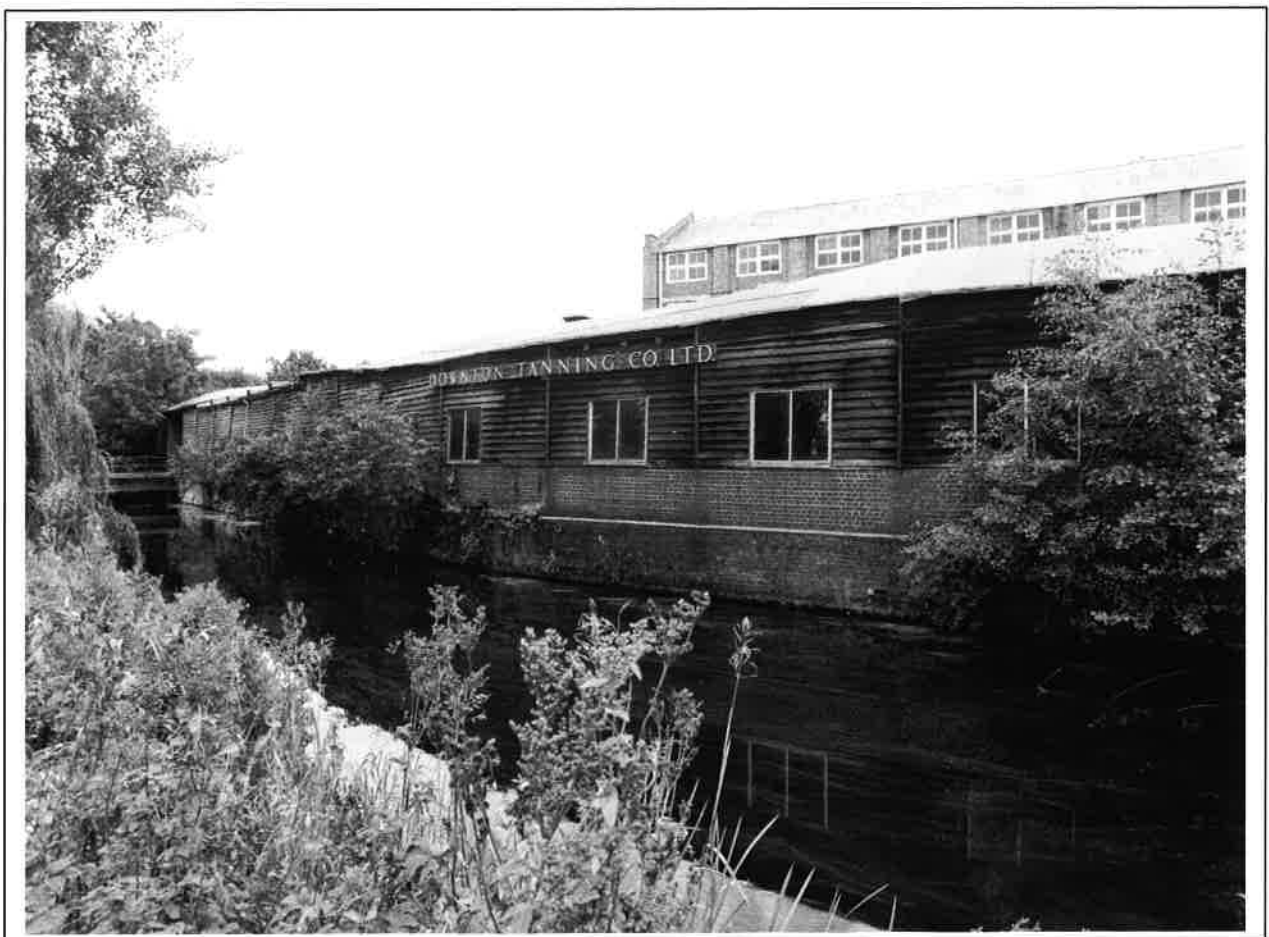
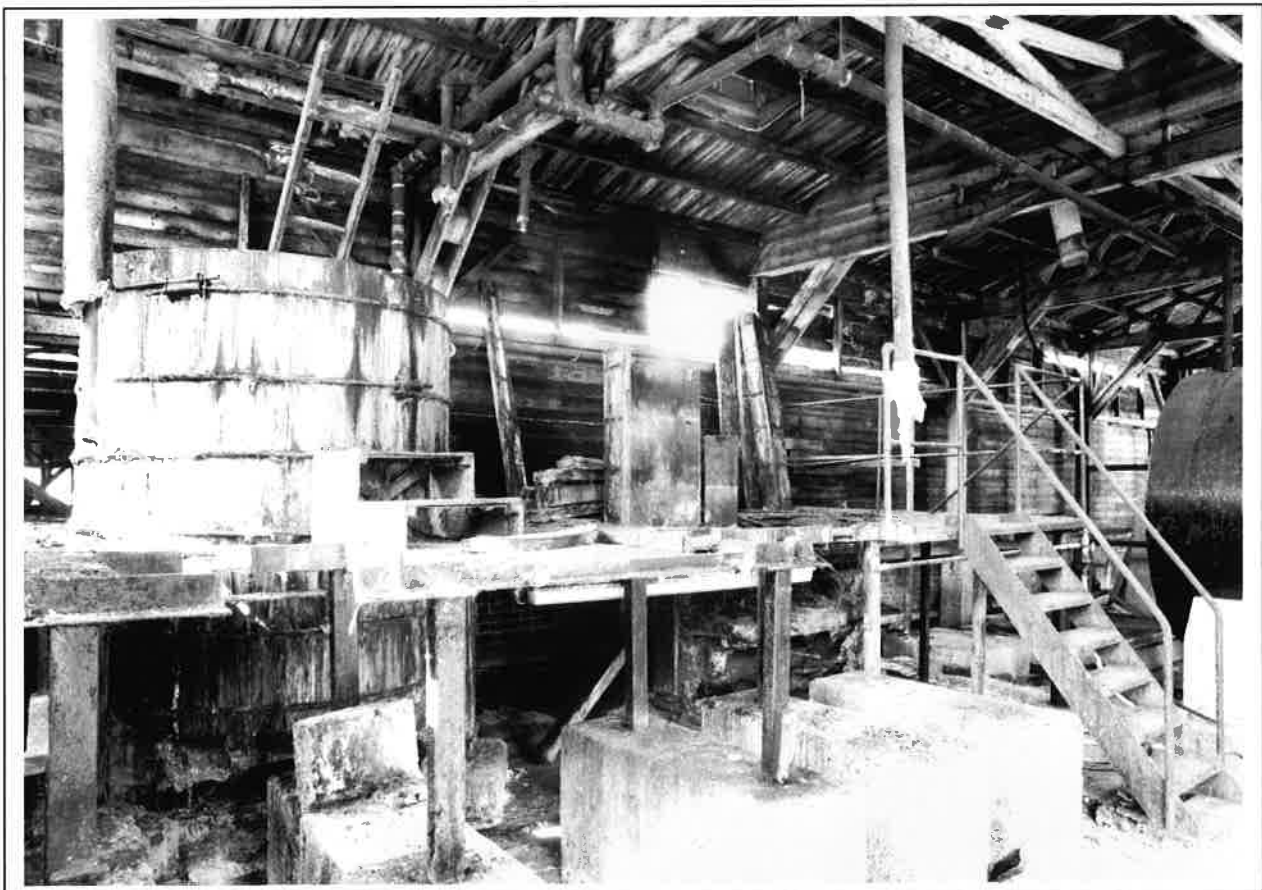




Plate 3: East elevation of main tannery building (Block 2)

Plate 4: Interior of Block 7 showing vats.



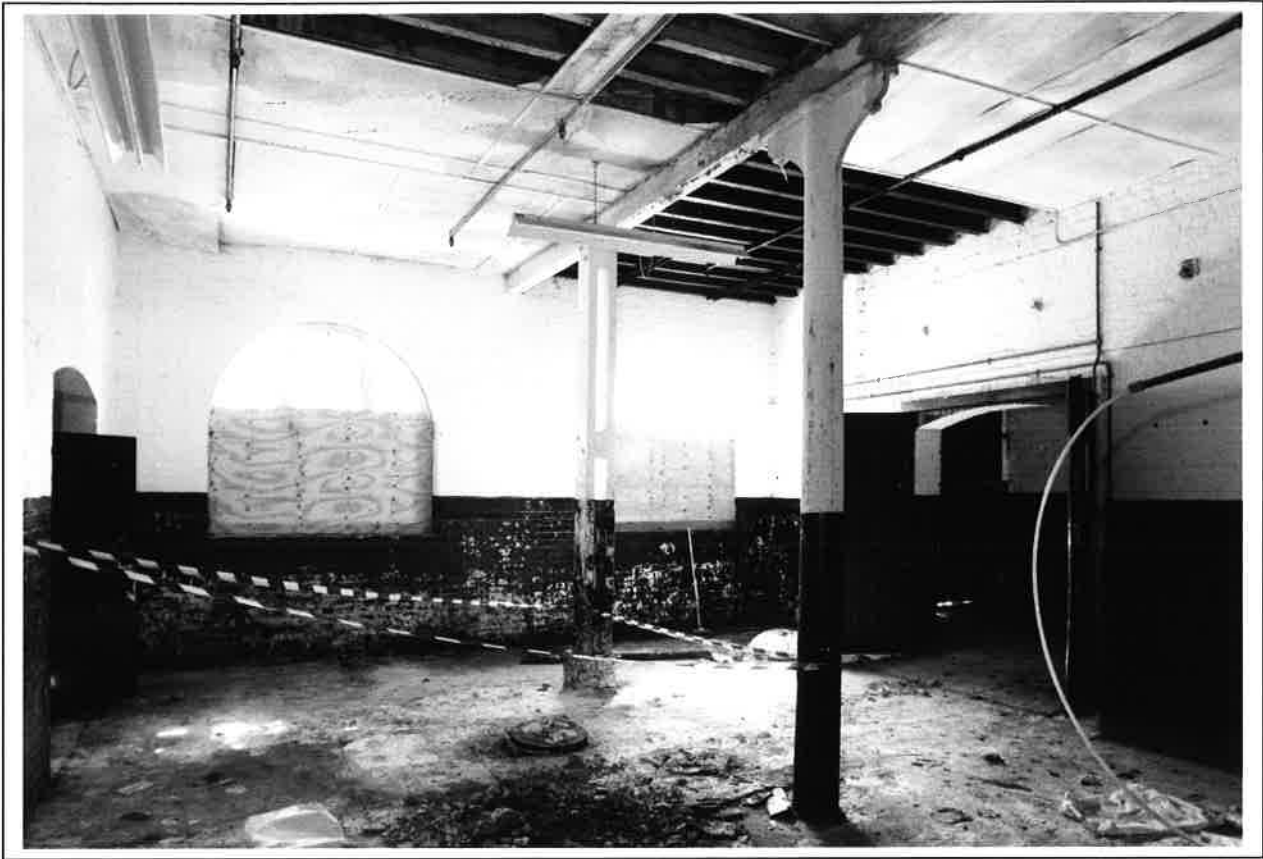


Plate 5: Interior of G17 (Ground floor Block 1)

Plate 6: Interior of G22 (Ground floor Block 2) with line shafting brackets on columns

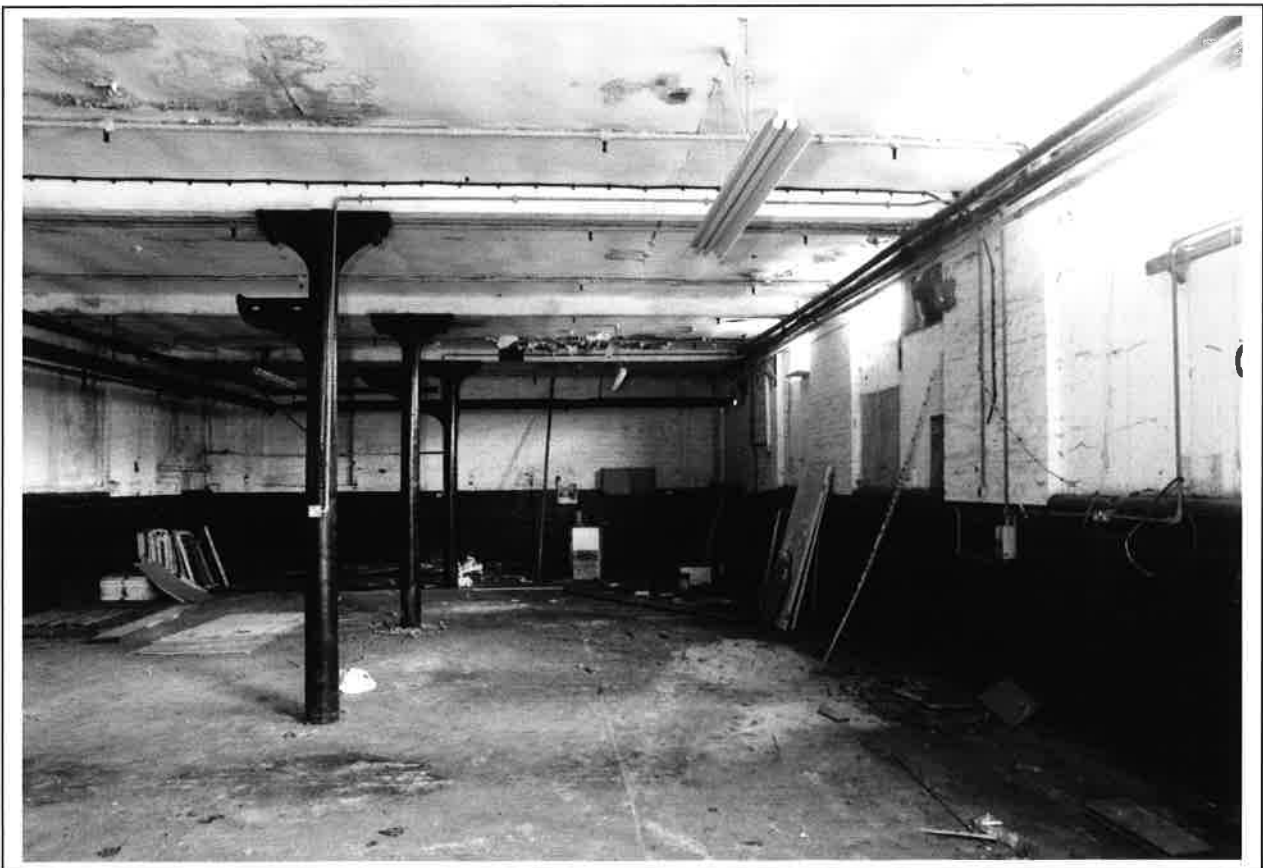




Plate 7: View within S5 (Block 2, second floor)  
Plate 8: View within T3 (Block 2, third floor)





Plate 9: Arched roof over tan yard viewed from Block 1



Plate 10: West elevation of Block 2



Plate 11: Block 7



Block 12: Blocks 7, 10 and northern end of site



Plate 13: Block 11 towards east side of site

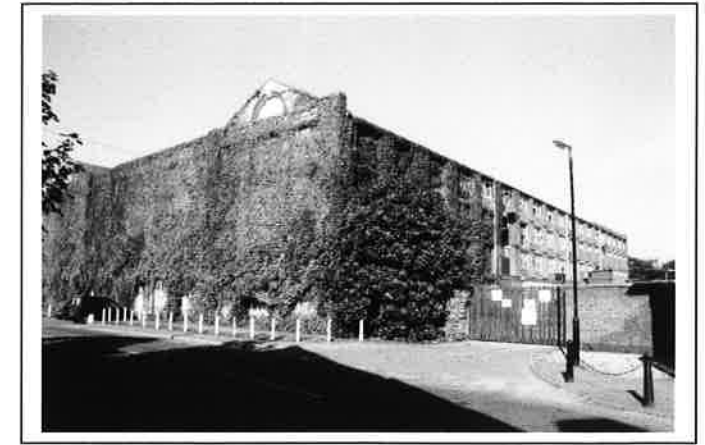


Plate 14: Blocks 1 and 2 viewed from south-east.



Plate 15: East elevation of Block 2



Plate 16: Lime yard viewed from south-west



Plate 17: Lift at third floor level



Plate 18: Typical window. West wall of Block 2

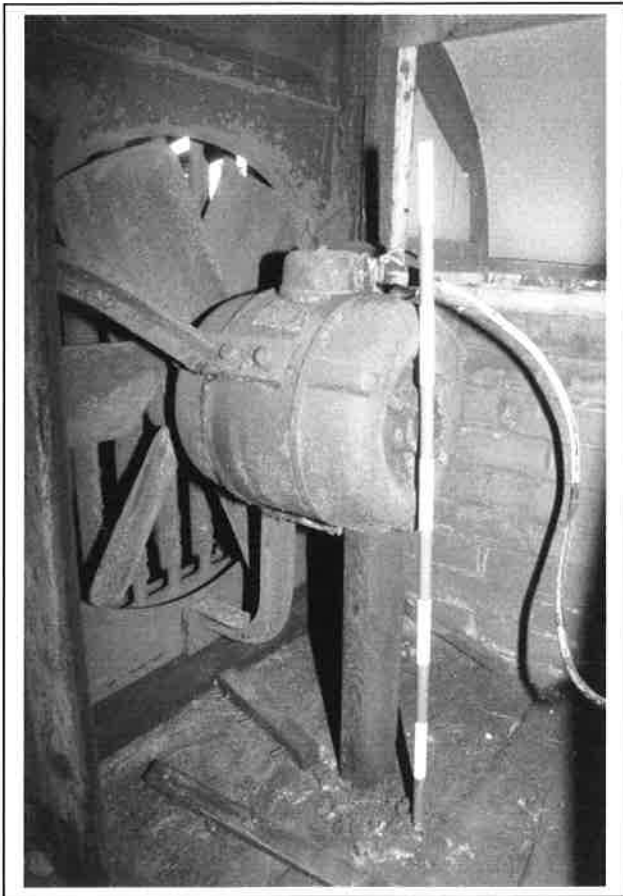


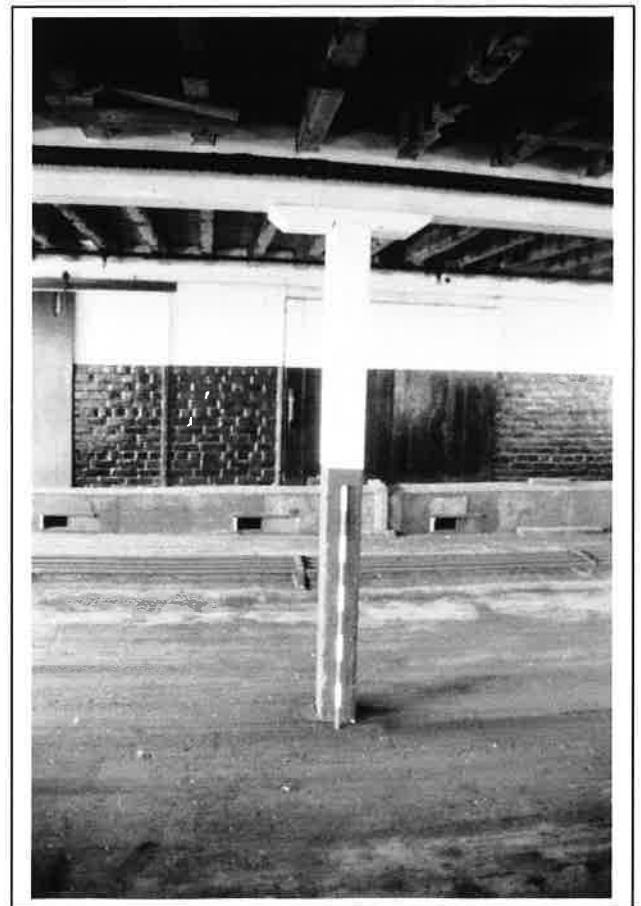
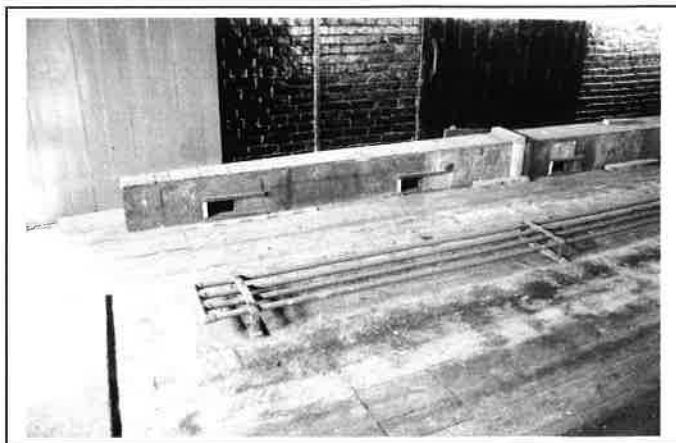
Plate 19: fan at end of duct at third floor level



Plate 20: trapdoors over main entrance from south

Plate 21: Typical post with duct behind

Plate 22: heating pipes and ducts within Block 2



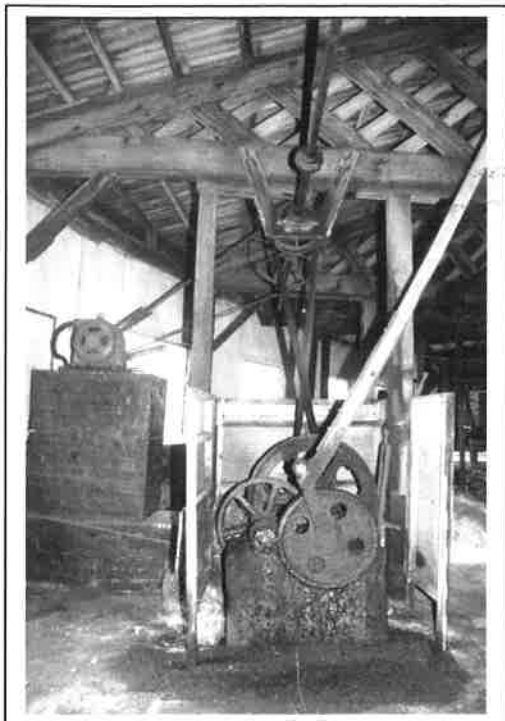


Plate 23: Power shaft and gearing at N end of tan yard

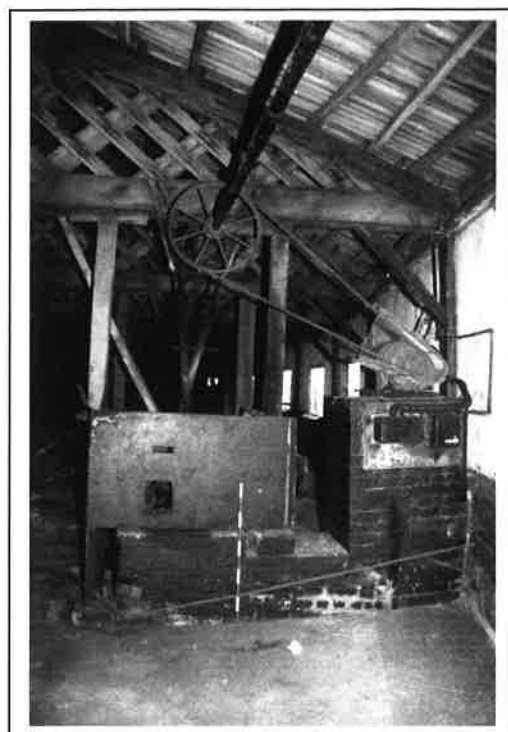


Plate 24: Shaft and gearing within tan yard

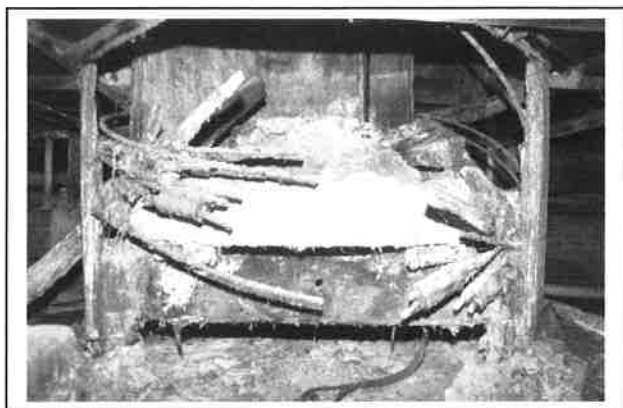


Plate 25: Broken base of vat in Block 7

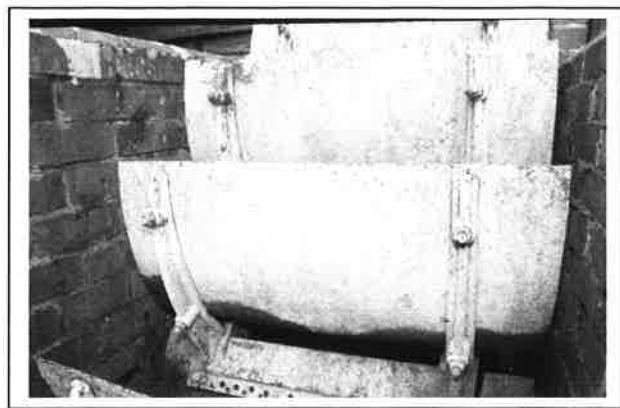


Plate 26: blades of waterwheel

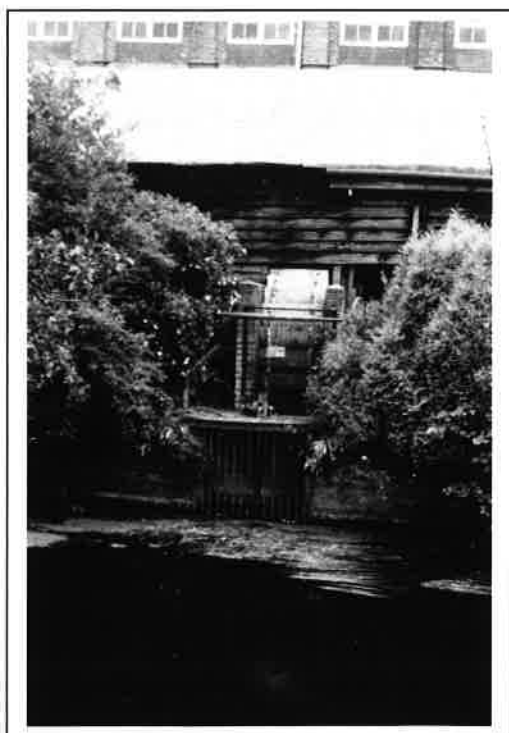


Plate 27: Waterwheel at west side of tan yard

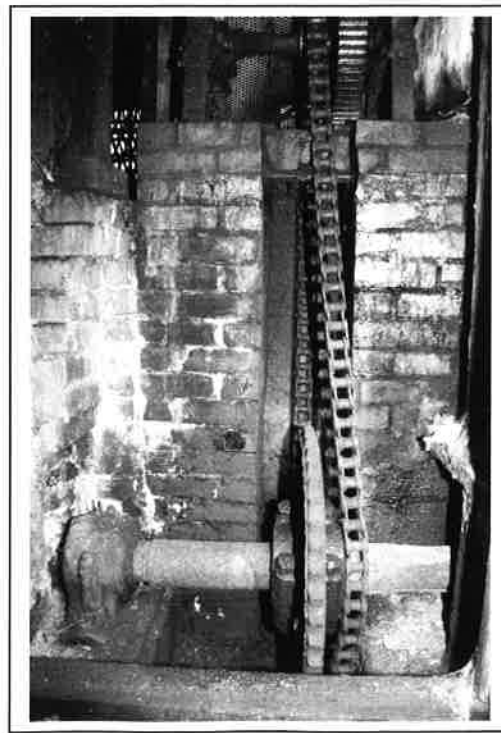


Plate 28: gearing adjacent to water wheel



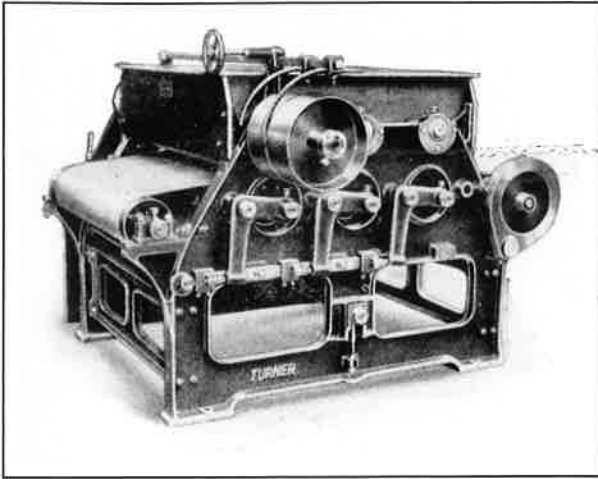


Plate 29: Sole leather polishing machine

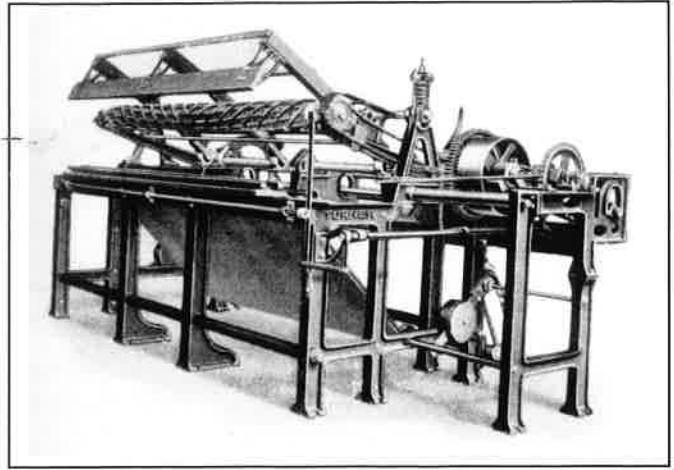


Plate 30: unhairing machine

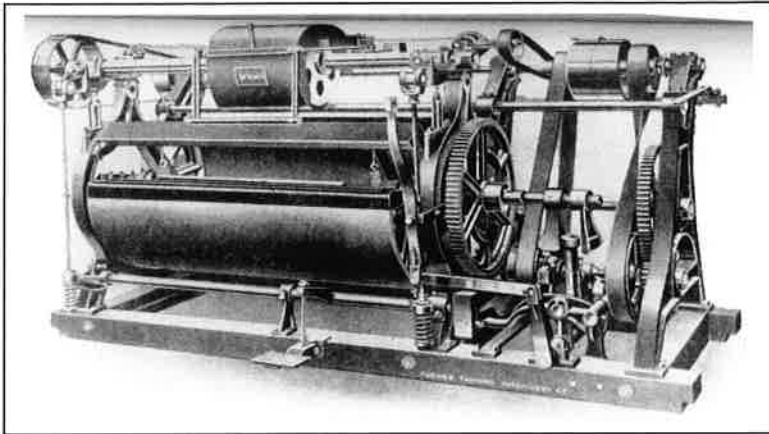


Plate 31: Setting out machine

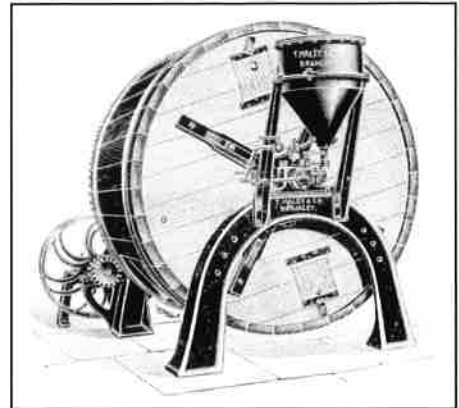
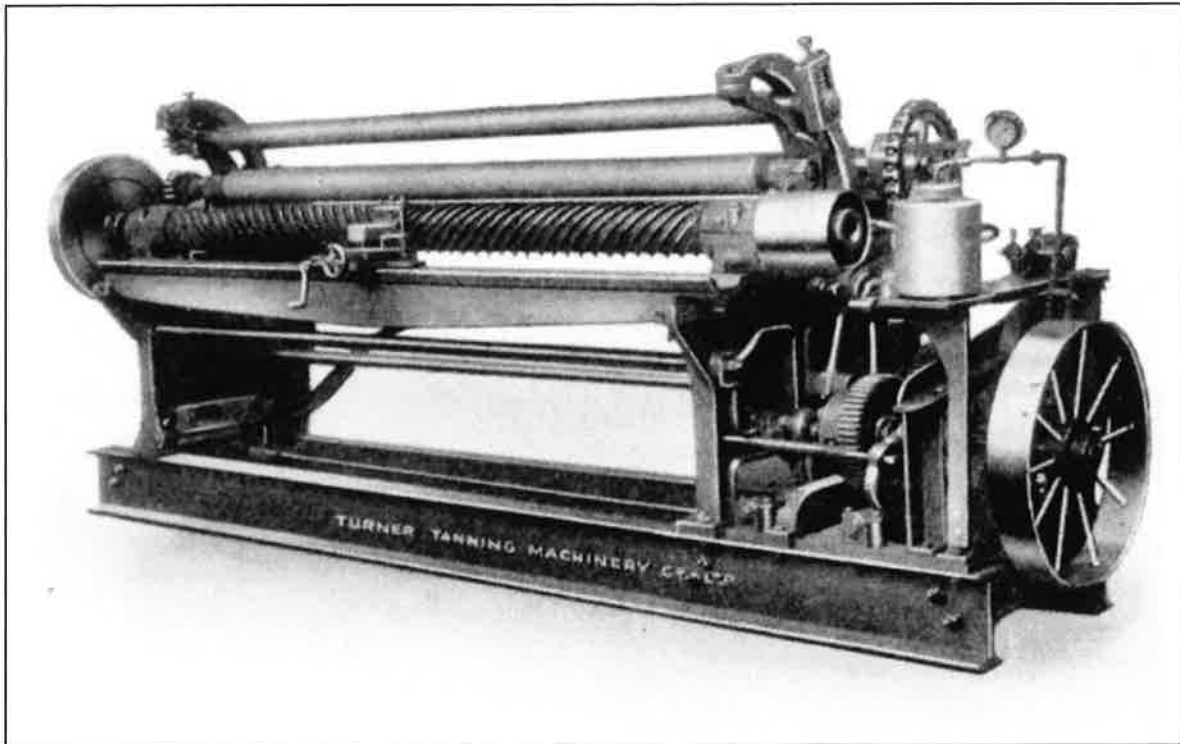


Plate 32: Leather-stuffing drum

Plate 33: Fleshing machine





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