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Standing Remains of the Former
Eliza Tinsley Ironworks, Reddal Hill
Road, Cradley Heath, West Midlands:

An Archaeological Building Record
2005

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Summary

Archaeological building recording was carried out at the site of the Eliza Tinsley Ironworks, Reddal Hill Road, Cradley Heath, West Midlands (NGR 395300 286900). Eliza 'The Widow' Tinsley moved her ironworks to the site in 1853. The surviving remains of the earliest works were Structure A, the chain-shop, fabric within Structure B and the original southern elements of the house Structure D. Originally production centred on nail-making but altered in the late half of the 19th century and became almost exclusively centred on chain-making. By the inter-war years the works had begun to mechanise and a general transition occurred to larger open factory units, in particular the construction of Structure C. Later renovation continued the development of the works away from hand-produced chains to machine-produced chains. The site represented an interesting example of the locally important chain industry, despite minimal survival of the original works and large-scale alteration of the site during the 20th century.

1.0 Introduction

In September 2005 Birmingham Archaeology undertook the archaeological building recording of a series of standing structures that constituted the remains of the former Eliza Tinsley Ironworks, Reddal Hill Road, Cradley Heath, West Midlands (Fig. 1). The work was commissioned by John Samuels Archaeological Consultants Limited and was a condition of the planning permission prior to redevelopment of the site. The specific purpose of the project was to record the standing structures and, in so doing, gain a full understanding of the building fabric within the context of the complex as a whole. This report outlines the architectural and historical development of the site as recorded.

2.0 Site Location

The site was located on the south side of Reddal Hill Road, Cradley Heath, (NGR 395300 286900) on a plot of land bounded by Reddal Hill Road to the north, Claremont Street to the west, Sidaway Street to the South and Mace Street to the east (Fig. 1 & 2). It was used as factory works for the Eliza Tinsley Ironworks until its closure in 2005. The topography of the land sloped gently south to north towards the road.

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3.0 Objective

The objective of the archaeological recording was to provide a permanent record of the principal upstanding architecture, specifically structures A to D (Fig. 2). The structural development of the site was to be established through investigation and interpretation of the building fabric supplemented by documentary research.

4.0 Methods

The survey was undertaken to RCHME Level 3, as defined in *Recording Historic Buildings: A Descriptive Specification* (RCHME 1996), of the principal structures of architectural and archaeological interest.

A measured, phased plan of the site was produced based on the Ordnance Survey map at a scale of 1:1250. This was supplemented by scaled measured survey of the archaeologically significant elevations and cross-sections of structures A, B and C at a scale of 1:100 by use of reflectorless EDM and in accordance with the principals laid out in *Measured Survey and Building Recording for Historic Buildings and Structures* (Dallas 2003) and *The Presentation of Historic Building Survey in CAD* (English Heritage 1999).

In addition to the drawn record, a referenced photographic survey was produced using black and white monochrome, colour transparencies, and colour digital at a resolution of 2 megapixel. Measured scales were used within the black and white monochrome archive survey.

Interpretation of the building was undertaken by use of written notes and interpretive plans detailing the evolution of the structure into its final form. The record included the external walls and roofs, noting the fabrics used and the forms of the main architectural features such as doors and windows.

The site-based recording work was supplemented by examination of historical material including maps, photographs and written documentation within the Smethwick Local Studies Library.

5.0 Historical Background

The industrial history and development of the Black Country is greatly influenced by its natural resources, including coal, fireclay and limestone. The raw materials for many of the Black Country and Birmingham small metals trades included iron, but the end products were very varied. Noticeable local specializations had emerged by the end of the 17th century and these have persisted to the present day. There was a thriving trade in saddlers' ironmongery at Walsall and locks were made at Brewood, Wednesfield, Walsall, Wolverhampton and Willenhall. Tin plate and japan ware were made in

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Wolverhampton and Bilston and so on. Cradley Heath, along with Halesowen, Old Hill, Brierley Hill and Quarry Bank, was known for chain making (Booth 1973, 28).

Cradley and Lye are old settlements, associated with the iron trades. By the 17th century the iron industry had become highly organised both technically and commercially, and large furnaces became the norm, one of which was built at Cradley (Brook 1977, 21). Cradley Heath, on the other hand, was a sparsely populated district at the beginning of the 19th century, and like many Staffordshire settlements, was hindered in its development by its relative isolation. With the cutting of the canals in the 19th century the mineral wealth of the area could be fully realised. The Ordnance Survey Edition of 1884 depicts a landscape around Cradley Heath densely occupied with large collieries, pits, railways with the canal located to the east. Around the middle part of the 19th century Cradley Heath mushroomed into growth, with many domestic trades including, nail-making and chain-making being prominent (Brook 1977, 180). Both these trades were arduous being carried out in hot and cramped surroundings, and women were employed in large numbers and stayed in the trade well into the 20th century (ibid. 24). Children were also employed, and one of the advantages of the nail-making industry was said to be that it gave employment 'to young and old, men, women and children'. The extensive employment of women was to become one of the features of the nail industry in South Staffordshire (VCH 1967, 240).

Nail making was the most widespread of all the industries in the region, although there was local specialisation in different types of nails. It was to some extent the least skilled of the Black Country industries, and was also, from the mid-19th century, the poorest paid occupation of the region. It was a domestic occupation, in which no division of labour was practiced. The nailer worked in a small forge or 'shop' attached to, or near, his home. It has been estimated that 50,000 people were employed in the nail trade in 1830 (Booth 1973, 28). It was from about 1830 that the factory product began to have an adverse effect on the hand-wrought trade (VCH 1967, 240).

Eliza Butler was born in 1813 in Wolverhampton, the only daughter of Benjamin Butler, A Maltster and Inn Keeper of the Golden Fleece. On 1st January 1839 at the age of 25 Eliza married Thomas Tinsley, who had already established himself as a self-employed nailmonger locally supplying wrought iron nails (Power 1998).

During the following 12 years Eliza and Thomas had six children, though Eliza's oldest daughter Elizabeth died in May 1851 followed a month later by her father. Following Thomas's death, despite having five children under the age of 11, Eliza continued to run the business under her own name, located principally in Sedgley, but with warehouses as far afield as Bromsgrove and Kingswinford (ibid.).

As with other craft industries, some merchant manufacturers began to concentrate the production of nails by building hand nail shops containing several hearths alongside their warehouses. By the beginning of the 19th century there were between forty and fifty merchant firms engaged in the nail trade. Government and dock contracts were important

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at this time. The East India Dock Company contract amounted to 110 tons a year before 1830 and, in 1820, the Admiralty contracted for about 640 tons of nails (Booth 1973, 30).

There were a great variety of hand-made nails for different purposes, but the highest quality were horseshoe nails. These not only required greater skill in the making, but also a better quality iron than other nails. This branch of the nail trade remained prosperous until the mid-19th century, while many other branches suffered. This was because attempts to mechanise the production of horse nails had failed, whereas the mechanization of other branches of the nail trade had succeeded and machine-made nails were ousting hand-made nails from the market (Booth 1973, 30).

In 1853 Eliza Tinsley moved the business to premises in Cradley Heath and soon became known locally as 'The Widow' (Power 1998). She is mentioned in the Staffordshire Encyclopaedia as being known as the 'Queen of Commerce' (Cockin 2000, 435). The site in Cradley, which had previously been the Earl of Dudley's farm, is where the business has been based until recently.

Over the next 20 years Eliza Tinsley built her reputation as a fair and knowledgeable businesswoman visiting customers throughout the UK and in 1870 even sent a representative to Melbourne, to set up a company in her name (Nostalgic Dudley).

There were many similarities between the Black Country nail and chain trades. Chain-making however, was more localised and was particularly concentrated in the Cradley Heath area. The chain-maker's workshop was almost identical to the nailer's shop. Only some of the equipment differed, and as in the nail trade many women were employed. There were almost as many varieties of chain as there were of nails; harness chain, twisted chain, chain for harrowing and all kinds of anchor chain. In the 1830s some of the larger chain-makers also began to forge anchors and some of the heaviest anchors ever produced, including one for the Titanic, were produced in the Black Country (Booth 1973, 32). By the 1860s there were about 2,000 men and boys employed in chain factories, although there were still some 300 small domestic shops employing another 2,000 men, women and children. About 50,000 tons of chain and cable were produced every year and 10,000 tons of iron was used in the manufacture of small chain (ibid.).

In the 1860's and early 1870s the chain and anchor trades expanded rapidly as a result of the ever-increasing demand from the shipbuilding industry and agriculture, though there was a temporary setback during the slump that began in the mid-1870s, and early in 1875 chainmaking firms were without sufficient orders (VCH 1967, 264).

According to the national census of 1871 around 4,000 people were employed by Eliza Tinsley, producing wrought iron nails, rivets, chains, chain cables and anchors. The business was the largest of its kind in Staffordshire with seven warehouses (Power 1998).

Many of the Company's employees were outworkers, living in the chain-makers cottages so prominent throughout the region. They would visit the site once a week to collect

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materials and then would return the following week with finished products forged in their own outhouses (ibid.).

Eliza retired in 1872 at the age of 58 and the business was taken over by four partners including G. Harry Green a former sales representative of the company. On 18th April 1882, aged 68, Eliza died at her home (ibid.).

From 1887 to 1914 expansion of the chain-making industry was resumed. Growth was, however, limited to a few sections of the industry. Until the 1880s the relative importance of the heavy-chain, chain-cable, and anchor trades compared with the old-established trade in light chains for agriculture had increased only slowly. The agricultural depression and the emergence of motor transport hampered the agricultural trade, and the expansion of the industry as a whole was due mainly to the demand from engineers, shipbuilders, and dock companies for heavy chains and cables (VCH 1967, 264).

Until 1888 no firm in the Staffordshire and Worcestershire chain-making district had successfully make chain cables under contract from the Admiralty. In that year, however, Joseph Wright and Co. of Tipton Green won a five-year Admiralty. The Admiralty renewed the contract in 1892 and in the same year placed a further contract with another local firm. By 1896 all the Admiralty contracts were placed with firms in the district (ibid.). As well as claiming to be able to supply any type of nail required, an advert of the time from the Eliza Tinsley Company also boasts of being Contractors to the Admiralty (Power 1998).

G. H. Green bought out one of his partners while one left and the other died, leaving the business in the control of the Green family. The business was passed down from father to son, gradually making a natural progression away from nail production. At that time, automation in manufacturing greatly influenced the product range, as did the prominence of motor vehicles, which greatly diminished the demand for horseshoe nails. Production eventually concentrated on chain manufacturing with very large links for use in the booming industries of the time, such as ship building and mining. The Company's chain production grew with these heavy industries, at one point manufacturing a mine chain 11.16" in diameter, 3720 yards long and over 23 tons in weight which the carriers (L. & N. W. Rly. Coy) believed was the longest and heaviest chain ever dispatched in one length from the Black Country (Power 1998).

During the three years preceding the First World War the Cradley trade reached its zenith, and South Staffordshire was left 'with almost a monopoly of the ships' cable trade of the world'. This development can be explained by the fact that chainsmiths continued to find Staffordshire wrought iron the most suitable raw material for articles susceptible to corrosion and those that required a reliable weld. The industry continued to pursue the traditional methods of manual production, which did not vary between factory, workshop, and domestic forge; it was only the need for power to drive the blast that drew workers into factories. In general the organization of the industry also remained unaltered (VCH 1967, 264).

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The techniques and tools employed in the hand-wrought chain and chain-cable trade are of a very specialised nature, though closely related to the art of the blacksmith from which they developed. Chain cable making is essentially a team job, three men being employed at each hearth. The traditional equipment of the chain-maker is simple. Each worker has a coke-breeze fired heath, and in almost all cases the blowing of the fire is by means of a fan blast. A specially shaped anvil, hand hammers of various weights and some other hand tools complete the equipment (VCH 1967, 265-6, Power 1998, Plate 13).

During the First World War sections of the industry turned over to the production of munitions. After the war the loose organisation of the trade and its pre-1914 dependence on foreign markets told against it, and during the post-war depression both Dudley and Cradley felt the effects of the decline in the demand for wrought iron chain severely (ibid. 265).

The Eliza Tinsley business was eventually passed down to Major George Harry Green, a Major from the 1st World War. He had four sons and two daughters, and with such a large family he was concerned that Eliza Tinsley and Co. Ltd would not be large enough to support his four sons and so in 1928 bought the Swindell Tool Company, a hand tool manufacturer founded by James Griffin back in the 1780s. It had previously supplied tools from its Griffin range to Eliza Tinsley but went bankrupt following the General Strike (Power 1998).

All four sons became involved in the running of the business up until the 2nd World War. While many manufacturing industries were changing production in line with the war effort, Eliza Tinsley was an important supplier to the Admiralty and so concentrated on chain production to cope with the increased demand from the ship building industry, while Swindell supplied pickaxes and shovels required after the bombing of cities (ibid.).

In 1966 the brothers acquired another long established Black Country manufacturer JT Parkes, a major supplier to Eliza Tinsley of door and gate ironmongery, which, in addition to Griffin Tools, was run by John Green. As well as the acquisition of local manufacturers, various production functions were also continuing at the Cradley Heath site. The original blacksmith shops manufacturing agricultural products in the old farm buildings were eventually replaced by chain workshops producing steel chain and assemblies, all of which were produced and tested on site. The machine shop put threads on the forgings produced by JT Parkes while hollowware was produced and galvanized in the Company's own plant. However, manufacturing costs were high and with new production methods and materials entering the market, as well as various products already being imported from foreign suppliers manufacturing at the site was gradually wound down. The site itself has obviously altered considerably over the years in-line with the changing business (Fig. 4). During Major G. H. Green's time there was originally a stable and small paddock on site and up until the 1950s horses were still used for local collections and deliveries, along with picking up coke used by the blacksmiths from Old Hill Railway Station.

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The running of the business eventually passed to non-family managing directors, although members of the Green family still work for the company (ibid.).

The Eliza Tinsley Company started out as a small nail making business founded in the mid-19th century in the heart of the Black Country. It is now a UK market leader and worldwide exporter of flexible connectors and hardware products (ibid.).

Cartographic Evidence

The earliest cartographic evidence for the site dates to 1884 (Ordnance Survey 1st Edition, Fig. 4). The north-west of the site was already substantially developed at this time, with Structure A established and good evidence that the earliest fabric of structures B and D, the large workshop and office block/house already in place. As well as several other small outhouses/workshops the main development on the site was a substantial north-south range parallel and to the west of Structure A. The surrounding area to the south and south-west was largely undeveloped at this time consisting of open fields and orchards. A cart track that ran north-west to south-east clearly followed the line of present day Mace Street and was probably the progenitor of it.

During the interceding years prior to the publication of the 1904 map (Ordnance Survey 1st revision, Fig. 4), the area between the site and the Stourbridge line of the Great Western Railway to the south had been largely in-filled with speculative terraced housing developments. Many of these were presumably associated with accommodation for employees of the works that employed around 4000 people by 1871 (*see above*). The works themselves had expanded to the south-west with the expansion represented by a complexes of long ranges within defined yard spaces but ultimately inter-connected to the main yard.

It was not until the inter-war years that radical development occurred again. By 1939 (Ordnance Survey 3rd Edition, Fig. 4) the site had expanded to the south-west and adopted the buildings aligned along Claremont Street. These were former industrial buildings, but do not appear to have been directly associated with the works until the 1939 map that depicted open access to the buildings from the rear of the site. The most radical change within the site was the construction and expansion of structures B and C that by this time had expanded to become the largest building on the site. Structure D also appeared to have been altered to its present size during this phase of alteration.

Alteration and expansion in the post-war years saw the replacement of smaller units with larger factory units. The first of these was the construction of Structure L by 1957 (Ordnance Survey National Survey 1943-1995). By 1973 large-scale units such as structures H and K had also been built. The site had reached its ultimate form with the removal of the majority of small-scale units and replacement with structures I and J by 1989.

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6.0 Description

Structure A (Fig 5-9)

Mid-to-late-19th century with later alterations. Former chain-shop. Constructed in machine-cut red-brick with blue-brick decoration in English bond. Pitched slate roof with large hipped roof vent on ridgeline.

Northern façade (Fig. 5, Plate 1) consisted of three recessed panels with blue-brick dentil decoration at top. Each contained blocked semi-circular arched windows, with arch decorated in blue-brick. Recessed pattern to gable picked out with blue and red brick polychromatic decoration. Painted barge boards at eaves. Eastern façade (Fig. 6, Plate 3) was partly obscured by later addition, Structure G. Nine-and-a-half plain recessed panels with expansion gap where panel seven would have been located. Dentil decoration at the eaves in polychromatic blue and red brick. Two small wood casement windows with bars in southern panels. Plain southern gable façade. Western interior elevation had been largely renovated by brick piers and opened to allow direct access to Structure H.

Two-room interior separated by brick partition (Fig. 9). Concrete floor with brick survival at the eastern side of building. Roof trusses in wood of Queen-post design with iron straps at the joints (Fig. 7 and 8), carried on walls with wooden corbels (Plate 5). Twin longitudinal joists connected each truss between the tie-beams. Most were removed but some were still in their original location.

The northern room was the larger of two, seven bays in length and open. Access from the north-west via ramp to yard. Eastern wall had offset course consistent with gantry location. Above this level were outlines of square blocked windows within each bay. Extant hearth and stack in north-east corner. Blocked segmental arch to hearth (Plate 6). In sixth bay against eastern wall was scar for former chimney locale (Plate 13, 14). Series of three brick squares survive within concrete floor.

Southern room smaller, three bays in length. Wide vehicular access between two rooms replaced earlier doorway. Open to the west with brick piers as with northern room. Curved brick piers on southern wall. Eastern wall contained two windows (as with exterior) with sliding shutters. Former chimney-stack with blocked hearth set against east wall. Roof space contained vent for hot air.

Structure B (Fig. 10)

Early-20th century, with elements of 19th-century survival, two-storey office/workshop structure. Ultimate use as office block. Original construction in machine-cut red-brick in English garden wall bond with the header course picked-out in blue-brick. Later renovation was machine-cut red-brick in the English garden wall bond. Largely rendered on southern and eastern facades. Flat-roof. Rectangular in plan.

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Principal eastern façade (Plate 8) was dominated by low late-20th century flat-roofed porch extending to the east. To the south of this were five bays of windows on ground and first floors. Those on the ground floor were double-glazed replacements, with suggestion that the originals were set within segmental-arched openings. Those on the first floor contained four-pane wooden casement windows. The southern façade contained four bays of openings that had seen alteration and addition to the window layout, but maintained the same spacing and pattern as the eastern façade. On the ground floor only a plain doorway with sliding door and single window remained but there was clear evidence in the interior for a further two original windows that maintained the style visible in the adjacent southern façade of Structure C.

The western façade (Fig. 10) was visible within the interior of Structure C. The ground floor had a single original segmental-arched doorway partially visible within the brickwork but had been blocked. Otherwise it had been extensively altered to increase access between the units with a further four later openings added (wide openings with concrete lintels). The first floor maintained five original openings, four segmental-arched window openings with 49-pane metal casement frames (Plate 7) and a single doorway.

The northern façade contained four bays of panels with wooden casement windows at first floor level within each. The brickwork between each panel was of original build with blue-brick decoration, whilst the panels were of later construction contemporary with the early-20th century renovation of the structure.

Interior was largely refurbished to office space and maintained no original features.

Structure C (Fig. 11)

Early-20th century single-storey factory unit, adjoining and constructed against Structure B. Constructed in machine-cut red-brick with blue-brick dressing in English bond. Interior is largely of box-girder construction. Slated pitched roof in southern two-bays, with Northlight roof design in northern two bays. Open plan with four east-west bays.

Principal southern façade (Fig. 11, Plate 9) consisted of six regular bays with segmental arched windows with heads picked-out in blue-brick. These contained 30-pane metal casement windows. The ultimate western bay contained a segmental arched doorway with sliding wooden door and a low ramp leading up to it. Plain corbelled eaves. The northern façade was partly obscured by the factory wall but contained four lights with concrete lintels and 20-pane metal casement frames. The eastern façade incorporated elements of the original part of Structure B (*see above*) whilst the western façade was open onto the modern extension, Structure N.

The interior was open with a concrete floor.

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Structure D

Late-19th to early-20th century house/office. Located adjacent to entrance. Two-storey machine-cut red-brick build in English bond. L-shaped plan with original 19th-century build at the rear and later early 20th-century build to the north and front.

Principal northern façade (Plate 10) faced Reddal Hill Road. Three bays at ground floor level. Central four-pane casement window flanked by two larger eight-pane casement windows. Concrete lintels and sills throughout. Six plain four-pane casement windows on first floor with plain soldier heads and sills. All first floor windows were replacement of earlier, and suggested frames were replaced at a contemporary period. Window design continued to eastern side façade, with two on ground floor, three on the first floor, the central window having been reduced. Dentil decoration to eaves picked out in blue-brick. No evidence for brick break in wall and continuation of design suggested the entire façade was replaced during early-20th century extension and renovation.

Southern rear façade had been rendered in common with Structure B. Ground floor windows reduced in size. Four first floor lights (with further identical light on the western façade of short southern wing), with replaced double-glazed, four-pane casement windows in each.

Slate covered hipped roof on 20th-century renovation and pitched roof on earlier build with ceramic ridge tiles throughout. Hipped roof contained three stacks, one at front, one on ridge-line and one at the rear. All had been reduced and pots removed.

Interior had been entirely refurbished in the mid-to-late-20th century. No evidence for former division. Only survival of early features were three chimney breasts all blocked and now redundant.

Structure E

Early-20th century factory unit (Plate 11). Constructed in machine-cut red-brick in Flemish Garden Wall bond. Pitched corrugated asbestos roof. Principal northern façade was single-storey with full wooden tongue and groove construction sliding garage doors. Four bays with pedestrian access in centre. Southern façade gabled and plain. Interior open and plain with concrete floor. Roof supported by L-form steel Fink trusses on brick piers.

Structure F

Mid-20th century house (Plate 11). Constructed in machine-cut red-brick in stretcher bond. Pitched slate roof with ceramic ridge tiles. Two-pot stack at front. Two-bay principal northern façade, Plain door with 3-pane wood casement windows on ground and first floor. Late-20th century glazed flat-roofed porch attached to northern façade. Garage located adjacent to eastern façade with principal façade to south and Mace Street.

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Structure G

Late-20th century flat-roofed office block located between Structure A and Structure E. Constructed in machine-cut red-brick in stretcher bond. Weather-boarding at eaves with felted flat-roof. Principal northern façade had two glazed doors and windows.

Structure H

Mid-20th century warehouse/industrial units (Plate 12). Constructed in machine-cut red-brick in the stretcher bond with corrugated asbestos roof in three pitched bays. Open loading-bay in northern façade. Interior is open plan in three bays corresponding with roof plan orientated east-west, with box-girder construction and brick piers supporting L-form steel Fink trusses.

Structure I

Mid-20th century warehouse unit contemporary and of similar construction to Structure H. Single pitch asbestos roof. Long open interior plan orientated east-west with similar steel truss roof construction to Structure H.

Structure J

Late-20th century industrial unit. Constructed in machine-cut red-brick in stretcher bond with corrugated asbestos roof with slight variation in the roof construction.

Structure K

Mid-20th century factory unit with later alterations. Constructed in machine-cut red-brick in stretcher bond with corrugated asbestos roof. Open two-bay interior plan orientated north-south. Roof Structure supported by steel Fink trusses.

Structure L

Mid-20th century factory unit. Constructed in machine-cut red-brick in stretcher bond with pitched corrugated asbestos roof. Southern gable façade had a series of three metal casement windows with concrete lintels. The eastern façade was dominated by a low six-bay, single-storey, lean-to extension with asbestos roof.

Structure M

Mid-20th century single-storey building. Largely of red-brick construction in Flemish garden wall bond. Hipped slate roof. Principal southern façade had twin doorways.

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Structure N

Late-20th century extension to the west of Structure C. Constructed in machine-cut red-brick in stretcher bond. Corrugated steel clad roof and gables.

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7.0 Discussion

The historical development of the site as the Eliza Tinsley Ironworks began in 1853, and none of the recorded buildings date to earlier than this time. Four broad phases of development can be seen within the standing structures consistent with the development of the site as seen through the cartographic evidence.

Phase 1

The earliest remains date to the period between the occupation (Fig. 4) of the site in 1853 and the publication of the 1st edition Ordnance Survey map in 1884. The earliest development presumably occurred during the first 10-20 years after occupation of the site in the 1850s and 1860s. By the later half of the 19th century the site was still confined to the eastern half of the present site, with a relatively small yard.

Stylistically Structure A dates to the earliest period between 1850 and 1860 and its assumed function as the chain-shop would make it one of the earliest buildings to be constructed on site. Evidence from within the building, two *in-situ* hearths and a third removed (clearly depicted in Plate 13/14), confirm the function as the principal foundry.

As initially trade at the works was associated with nail production it is likely that the structure originally housed a series of small-scale hearths and work areas. It is unclear how the layout of the building changed as production altered from nail to chain production in the latter half of the 19th century. The works specialised in medium to large-scale chains for industrial usage by the end of the century (Power 1998). This practice was consistent with a male workforce (as opposed to the largely female workforce of small chain production) working in teams around a hearth, as in contrast to single workers at a hearth.

The small hearth associated with nail production would have easily converted to medium-size chain production. However, it is likely that alteration would have occurred to allow large chain cable production. Photographic representations dated to the 1920s show depictions of a very similar contemporary 19th-century chain-shop with hearths spaced at around every 10 feet along either wall at Noah Hingley's works (Fogg 1981, 3). The relatively small number of hearths within the foundry may suggest that further hearths were located on the western wall and subsequently removed during the renovation that saw the opening up of the building and connection to the adjacent Structure H. The roof of the building had almost certainly been replaced removing any evidence of hearths and associated stacks within the building. Typically these would be seen with small high stacks at even intervals, located along the eaves-line of the building and pitch-roofed vents along the ridge-line such as at Jones and Lloyd in Cradley Heath (Fogg 1981, 16). The sub-division of the building at the south and positioning of the roof vent may relate to early alteration of the building after the conversion from nail to chain production.

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Other evidence of structural survival prior to 1884 could be located within the fabric of structures B and D. Structure B was depicted on the 1884 map (Fig. 4) with the same plan as seen during the current survey. Certainly elements of the western façade were consistent with a date prior to 1884 and the building appeared to have been of two-storey even from this early date, as openings are visible on ground and first floors. The northern façade retained evidence of the original build. However, the rendering within the remainder of the build prevented clear dating of the fabric and survival of the earliest build may have occurred in common with the north façade. The function of the building is unclear but may have always been associated with storage or finishing processes as opposed to actual chain or nail production. It is more likely these were undertaken in the large number of workshops visible on the 1904 Ordnance Survey map (1st revision, Fig. 4).

Like Structure B, survival of the first phase of development could be seen within the fabric of Structure D. The original L-shaped building was visible within the construction of the present structure as the pitched roof element at the south and rear of the building. When the building was refurbished much of the original fabric was demolished or incorporated into the new structure. Therefore, the survival is probably limited to the southern wing and façade.

Phase 2

The latter half of the 19th century up to the First World War does not appear to have resulted in large-scale alterations of the site but had resulted in the acquisition of adjacent land (Ordnance Survey 1st Revision, Fig. 4) probably owned by Roxburgh House and the construction of small-scale units on this land. The inter-war period saw the first large-scale alteration of the site.

Structure B was altered at this period with the southern and eastern facades replaced and the roof reduced and flattened. The segmental-arched windows were consistent with those in the adjacent Structure C and suggested a whole scale alteration. The internal usage of the building was unclear but must have been associated with the finishing processes, storage or offices as there appeared to be no provision for furnaces.

Structure C was constructed as part of the remodelling of this area of the site. The presence of northlight roofing bays suggested fine work was undertaken as this type of roof was specifically designed for even light free from glare as they faced away from the sun. However, the invention of the electric chain-welding machine in the early-20th century (Fogg 1981, 8) corresponded closely with the construction of this building and it may have represented the initial phase of a general transition from hand produced chains to mechanised production.

The expansion of Structure D north towards the street probably occurred at this period. As discussed above this involved the large-scale renovation of the Phase 1 building and

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the construction of the hipped roof building to the north. Both the eastern and northern façades stylistically date to this period with the eastern façade replacing the earlier phase 1 façade within the structure.

Contemporary with these developments was the construction of the single-storey factory unit Structure E and the adjacent house Structure F. Structure F was probably associated with the works and acted as accommodation for the foreman and his family. The wide doors to Structure E suggested this was a garage and an inter-war date for its construction would be consistent with the transition from horse-and-carts to a motorised fleet.

Phase 3

After the Second World War a period of large-scale alteration occurred to the south-west of the site with a change from small-scale units and a gradual transition to larger units. In the 1950s structures K, L and M were constructed and by the 1970s the majority of the smaller units were extant and had been replaced by large-scale structures H and I. These were purpose built for mechanised production where economies of scale meant the difference between survival and capitulation in a period of increased economic pressure. It also corresponded with the cessation of hand-produced chains within the works.

Phase 4

The final phase of construction relates to late-20th century buildings J and M constructed prior to the end of the works operation in this locale.

The Eliza Tinsley works represented a substantial employer in the local area. As such, the longevity of work on the site meant the survival of the earlier 19th-century remains was limited. Wholesale changes within the site after the First World War meant remains from the original layout of the works were limited to the former chain-shop, Structure A, with low levels of survival of 19th-century fabric within structures B and D.

In terms of industrial processes, it was probable chain and nail production were housed in a series of workshops, of which Structure A was the best surviving example. It may be that Structure B was storage, office or workshop space, but no definitive answer can be ascertained, as survival was poor. By the inter-war period the works had modernised and chains were now produced on machinery probably housed in Structure C.

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8.0 Conclusions

The limited survival of early remains within the works suggest that although they represent an interesting example of an important industry within the immediate area around Cradley Heath they are of low national significance and offer limited further information about the chain-making industry.

Acknowledgements

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1919 Ordnance Survey 1:2500, Staffordshire Sheet LXXI.8

1939 Ordnance Survey 1:2500, Staffordshire Sheet LXXI.8



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Fig.1

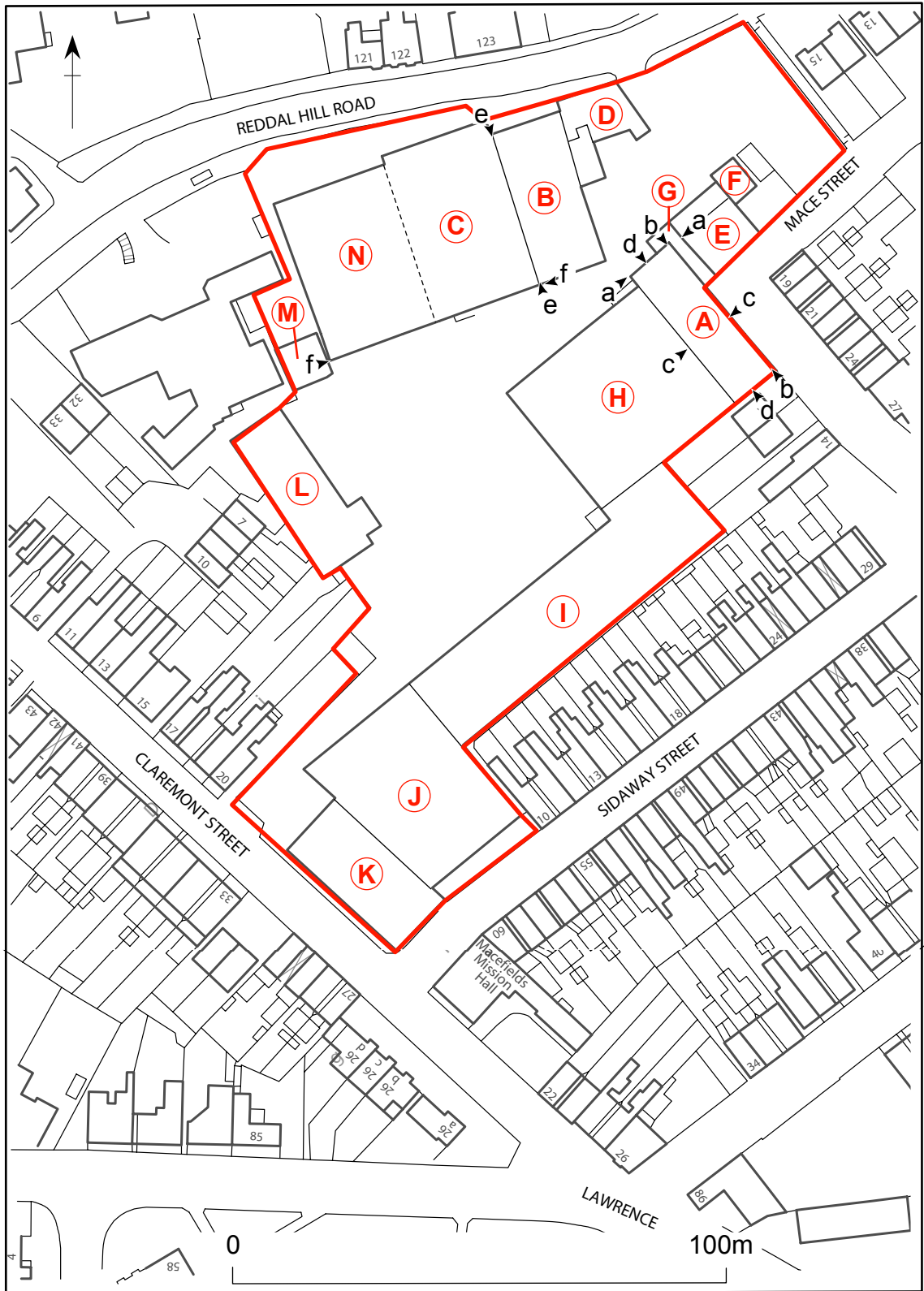


Fig.2

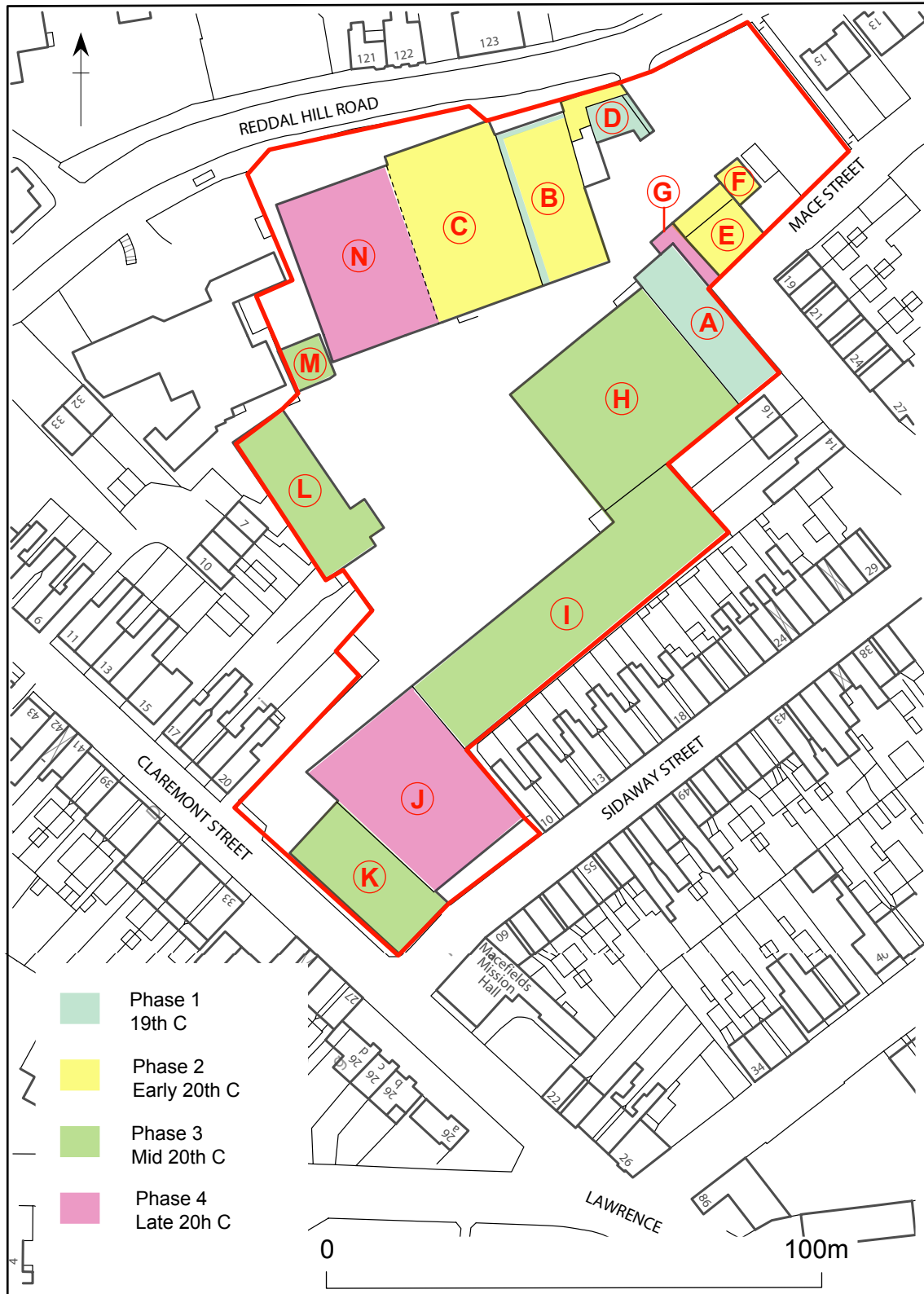


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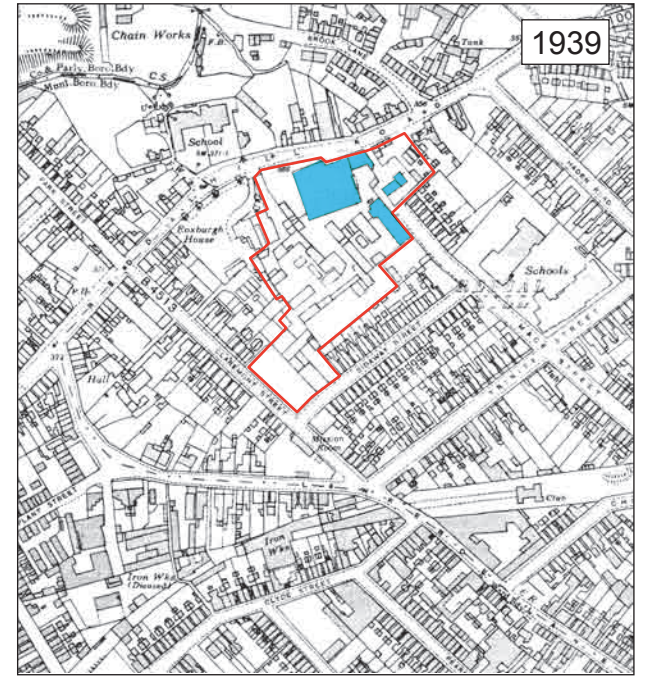
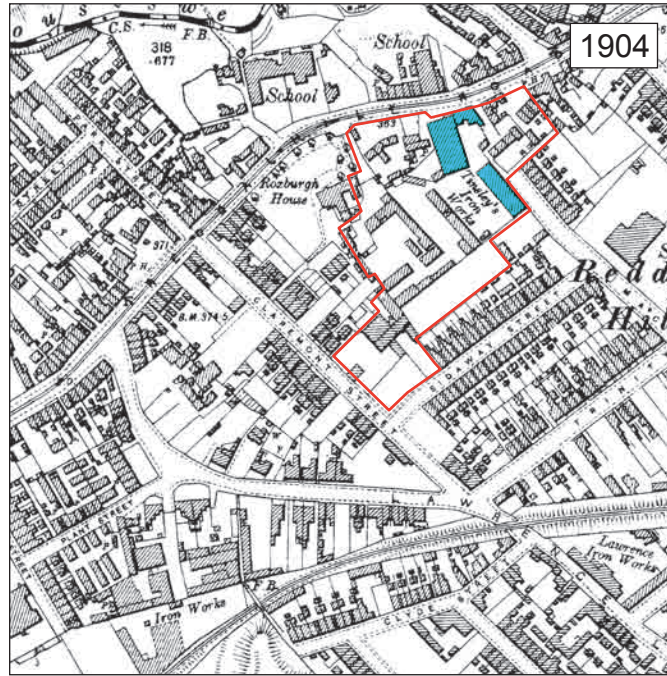
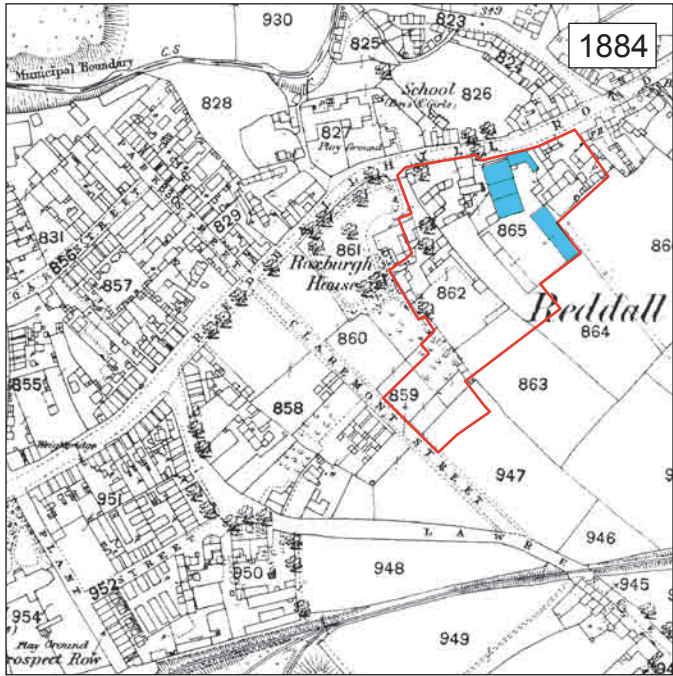


Fig.4

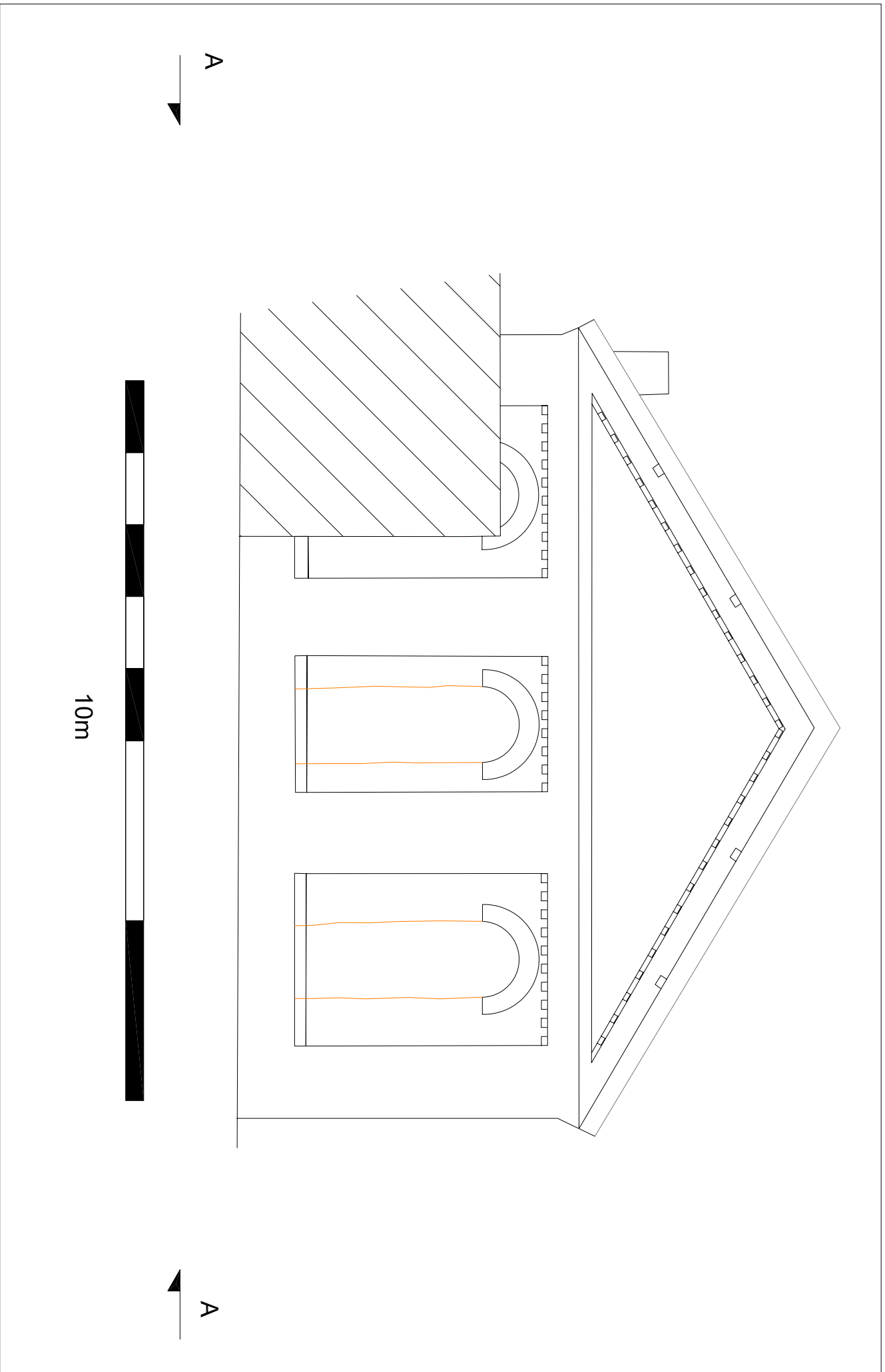


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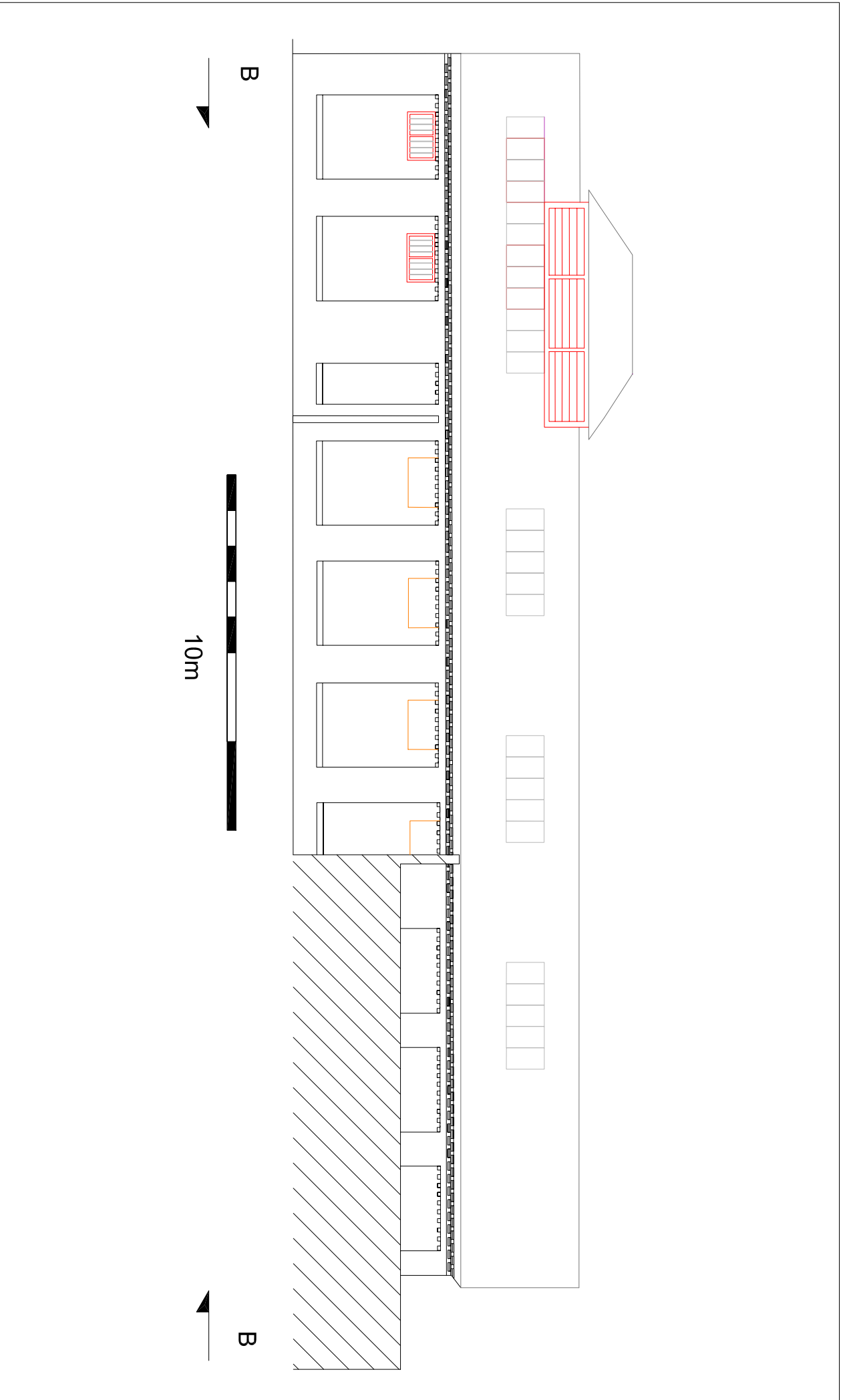


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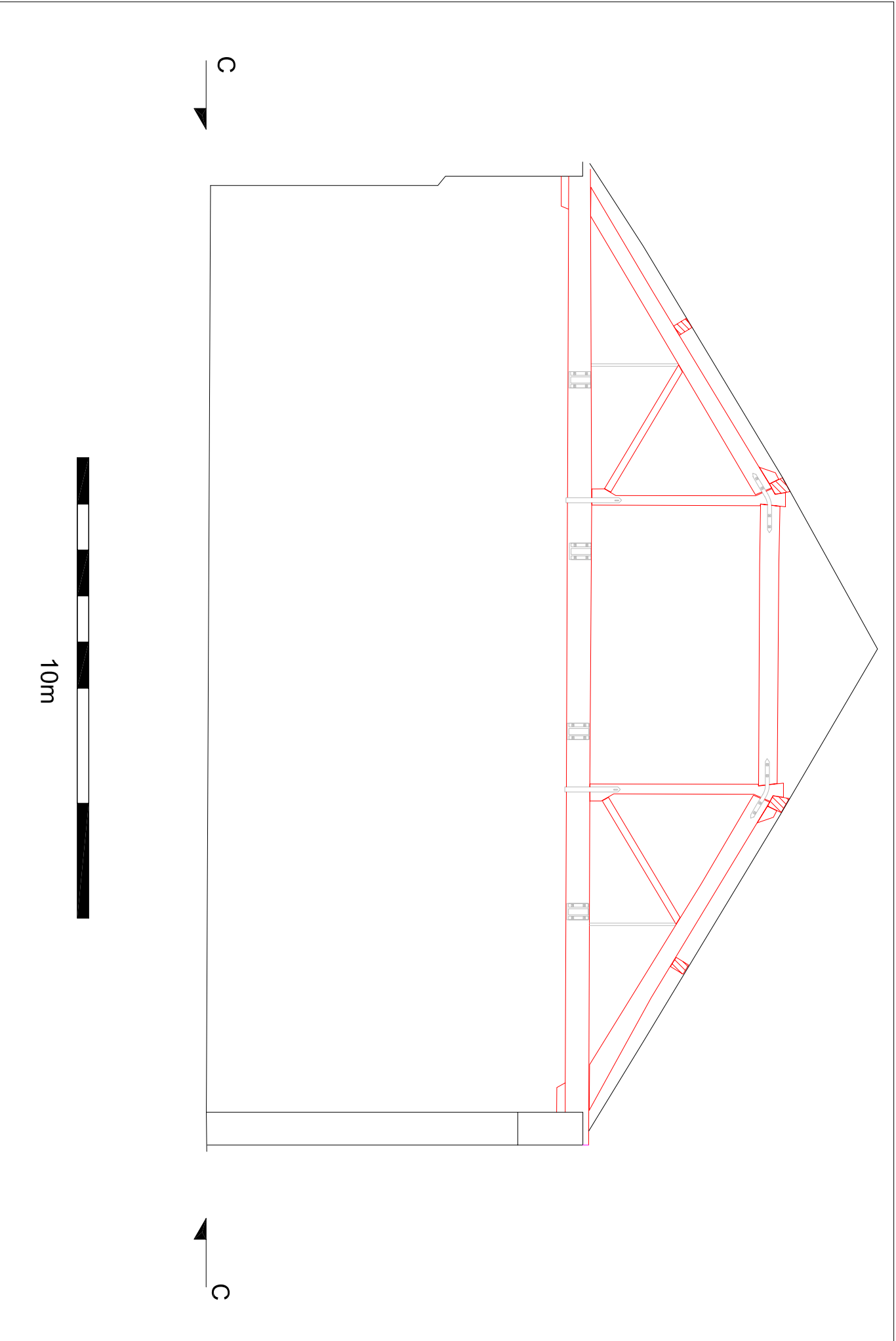


Fig. 7

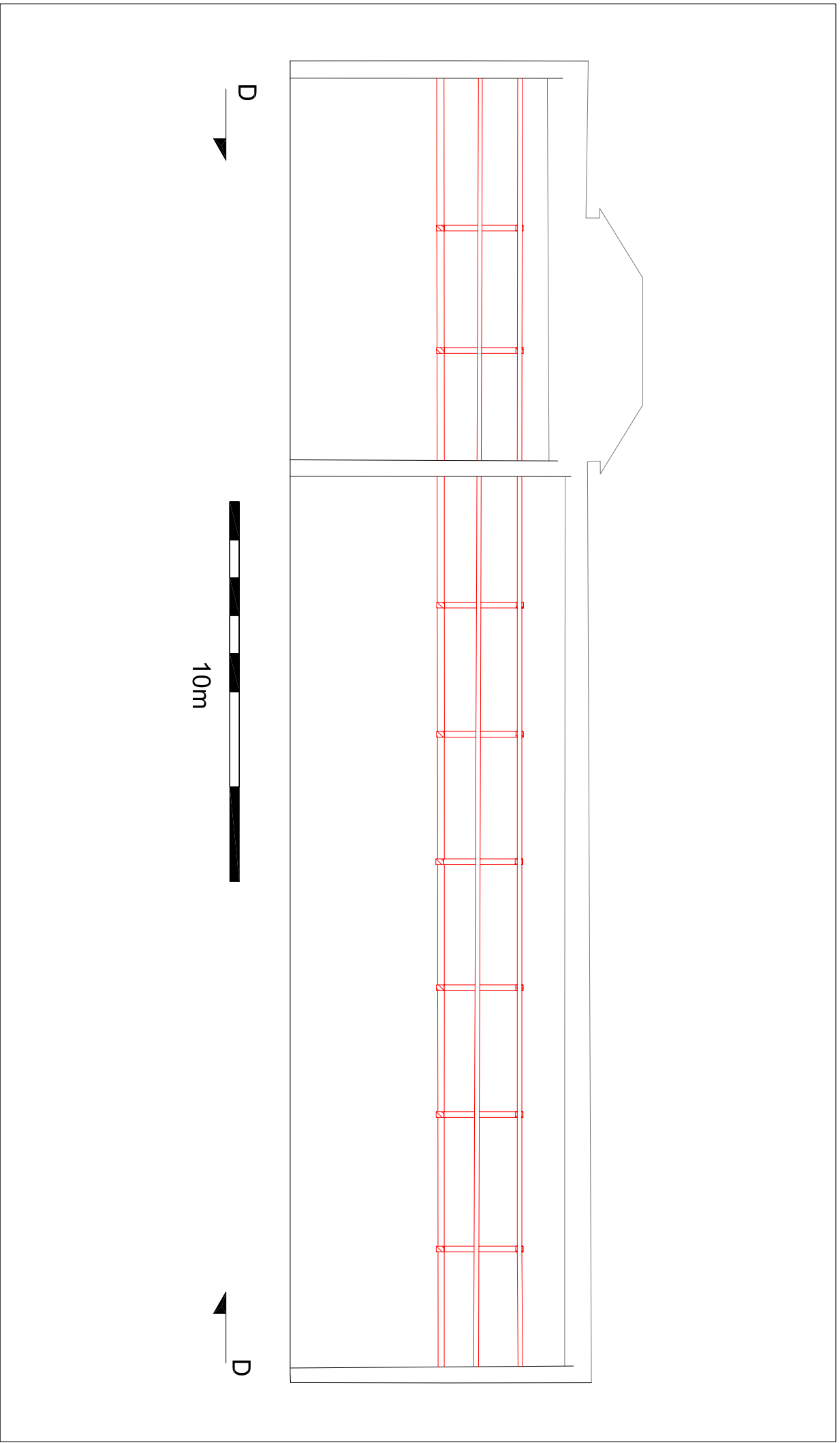


Fig. 8

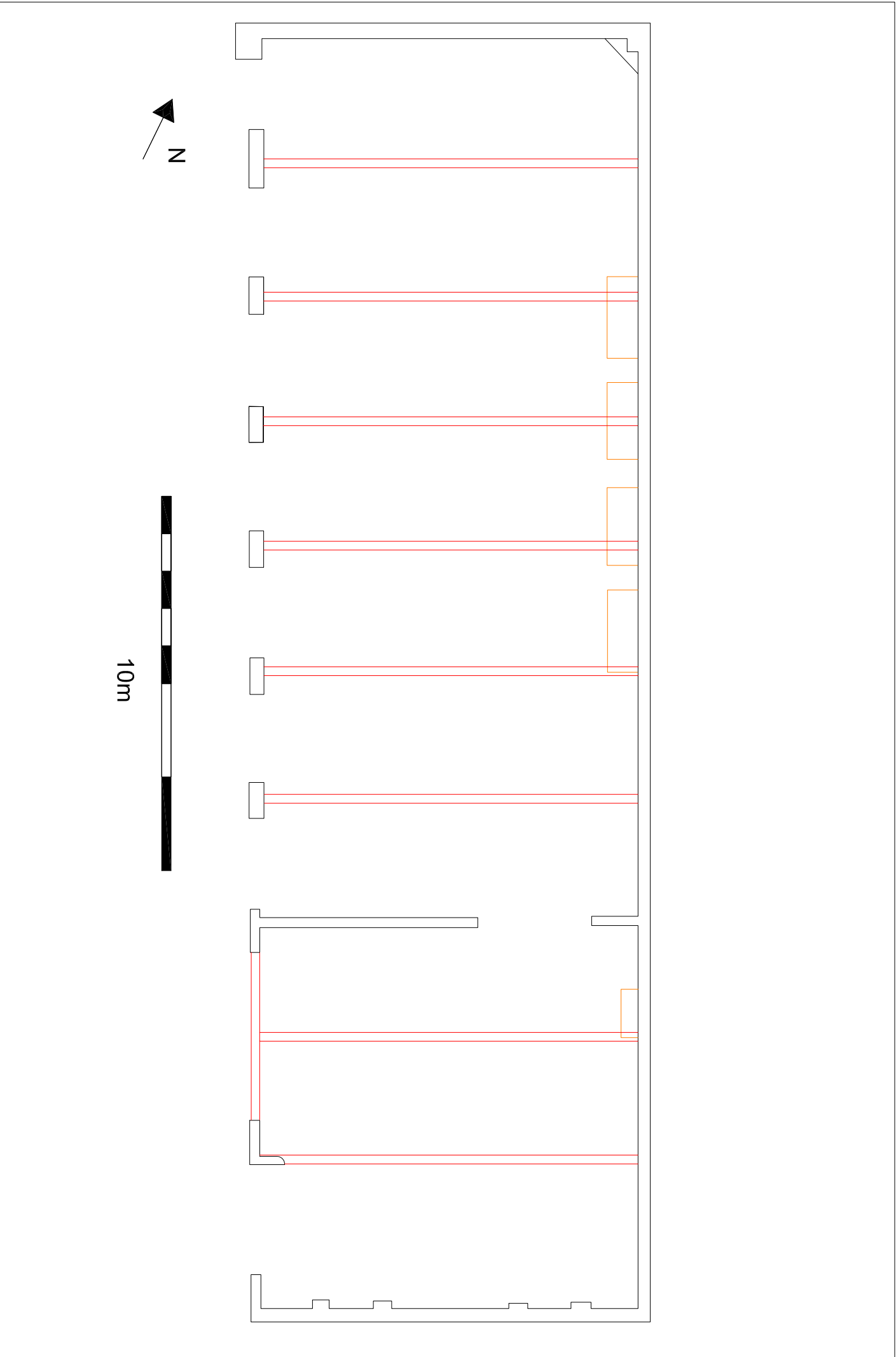


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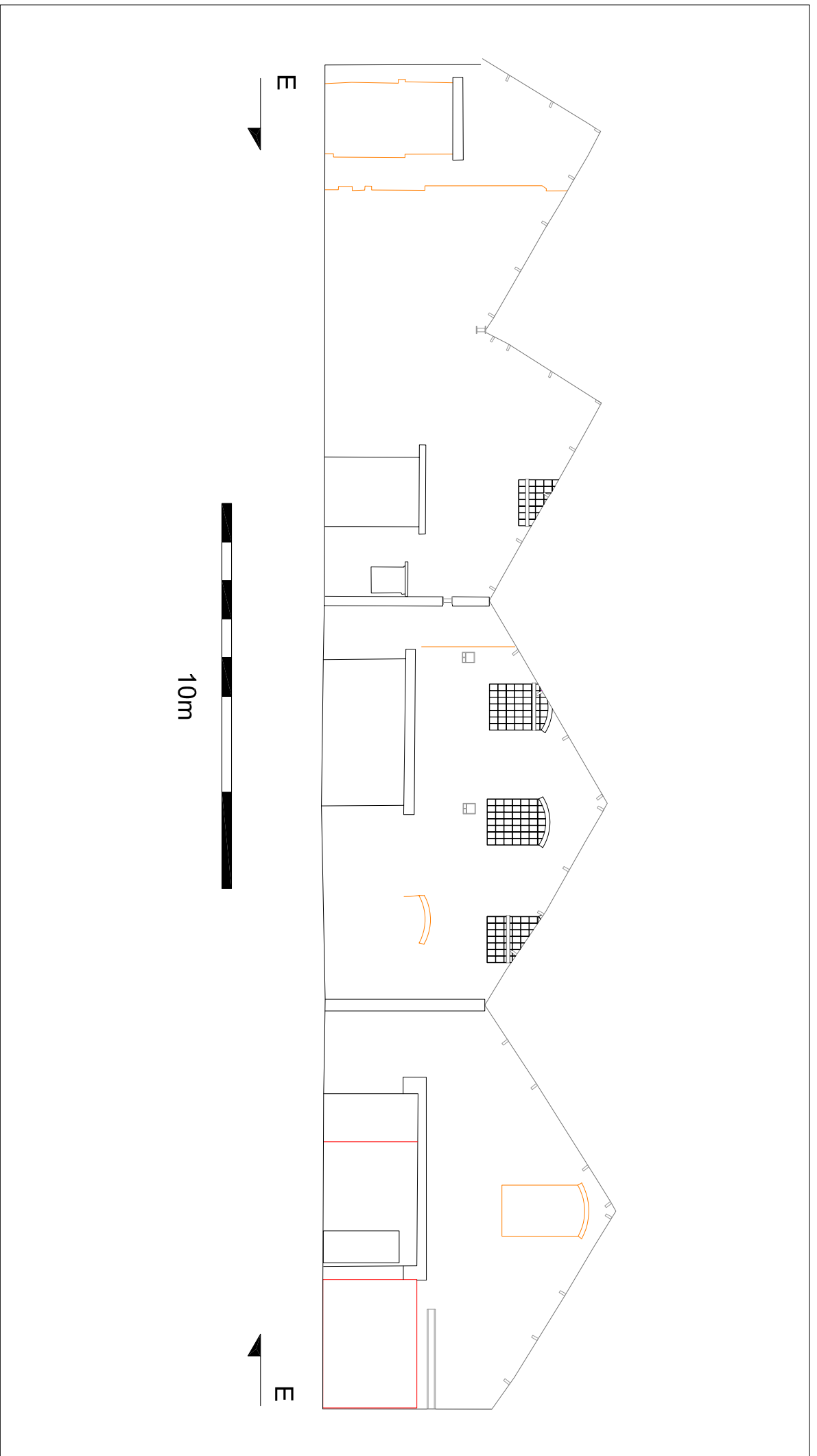


Fig. 10

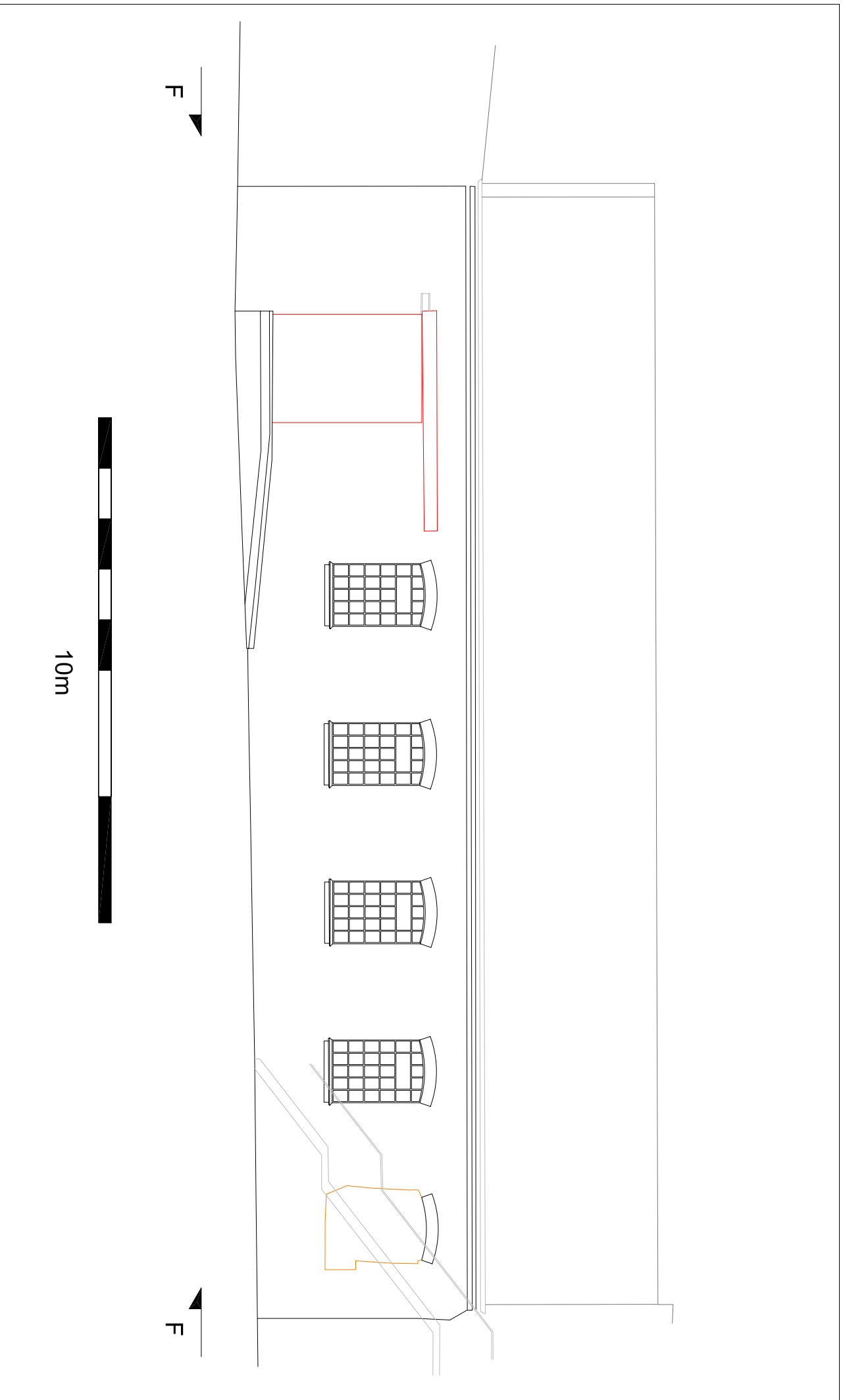


Fig. 11



Plate 1



Plate 2



Plate 3



Plate 4



Plate 5



Plate 6



Plate 7



Plate 8



Plate 9



Plate 10



Plate 11



Plate 12

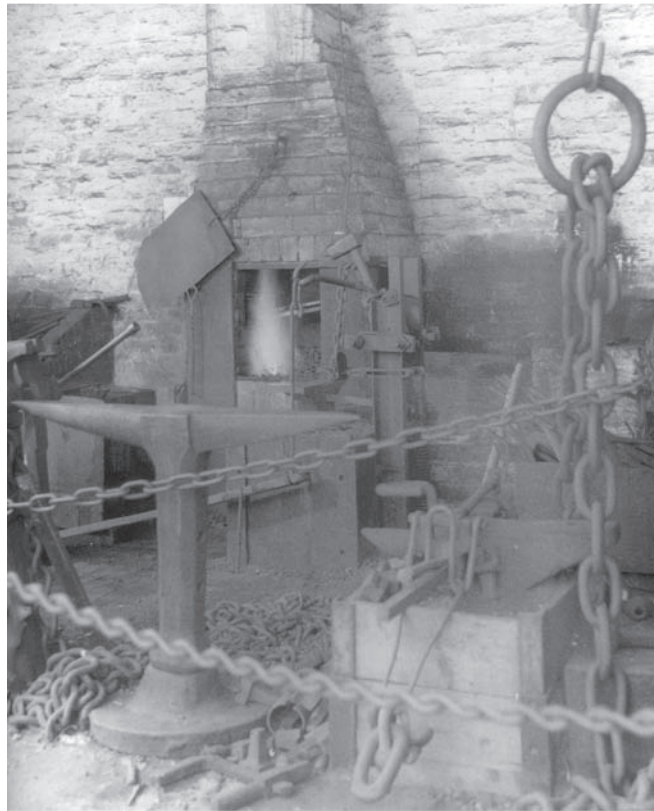


Plate 13



Plate 14