

## **APPENDIX**

### **ROYAL WORCESTER PORCELAIN WORKS, HISTORICAL AND INDUSTRIAL RESEARCH OF THE GROUP COMPOSED OF BUILDINGS E and G**

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### **The group composed of Buildings E and G**

These two buildings form a connected group lying west of the fossilised road (Prince's Drive) which runs roughly from south to north through the site. Prince's Drive divides the site into two distinct geographical and historical parts. The area to the west runs up to Severn Street and has a fan-like morphology spreading out eastwards either side of the early Chamberlain's workshops which were built (in part) in the 1780s and formed the nucleus of the later works (Figure 1). The area to the east borders the Worcester and Birmingham Canal and was initially related to the reception of coal and clay but from the 1870s some manufacturing had also spread to the area.

In summary, the Chamberlain's workshops lay at the centre of the site as established before 1842 and followed this general trend eastwards to reach the fossilized road by 1863 (Figures 2 and 3).

Thus two internal roadways spread out from an apex to the front of (west) the tea rooms forming the boundary which contained Building E on the north and Building G on the south. In particular this dictated the shape of Building E and the placement of Building G. To the north of Building E lies the 'Bone Mill' (Building D) and, to the south, Building J. The land on which Building E was to stand was purchased in June 1851 and that for Building G in August 1854 (see Figure 7).

### **Outline development of Buildings E and G**



**Figure 1: Buildings E and G around 1890**

**In the foreground is Building K1 (left) with Building H to the right. Behind H are the four bottle kilns of Building G with the façade of Building E to the right (enlarged from a source in the Worcester Porcelain Museum).**

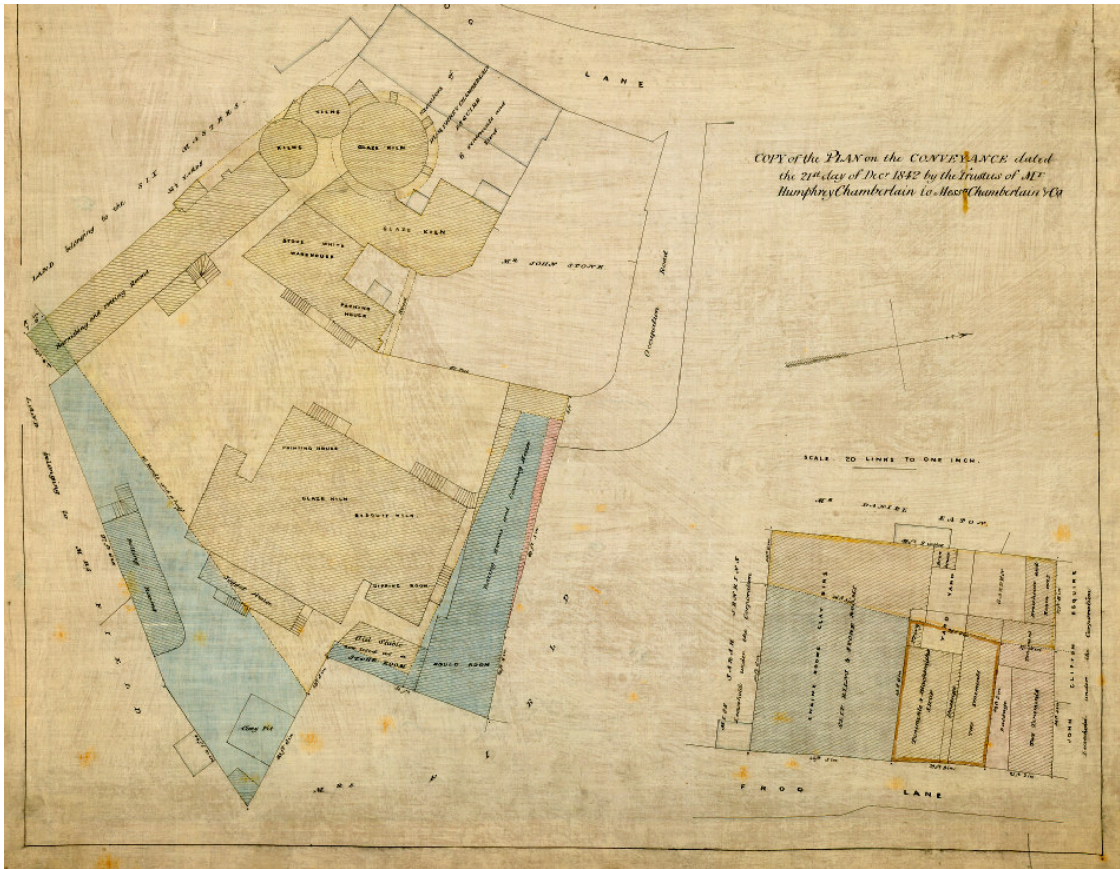


Figure 2: The Worcester Porcelain Works in 1842 (source: Worcester Porcelain Museum C25)  
1 'COPY of the PLAN on the CONVEYANCE dated 21st Day of 1842 by the Trustees of Mr Humphrey Chamberlain to Messrs. Chamberlain & Co'.

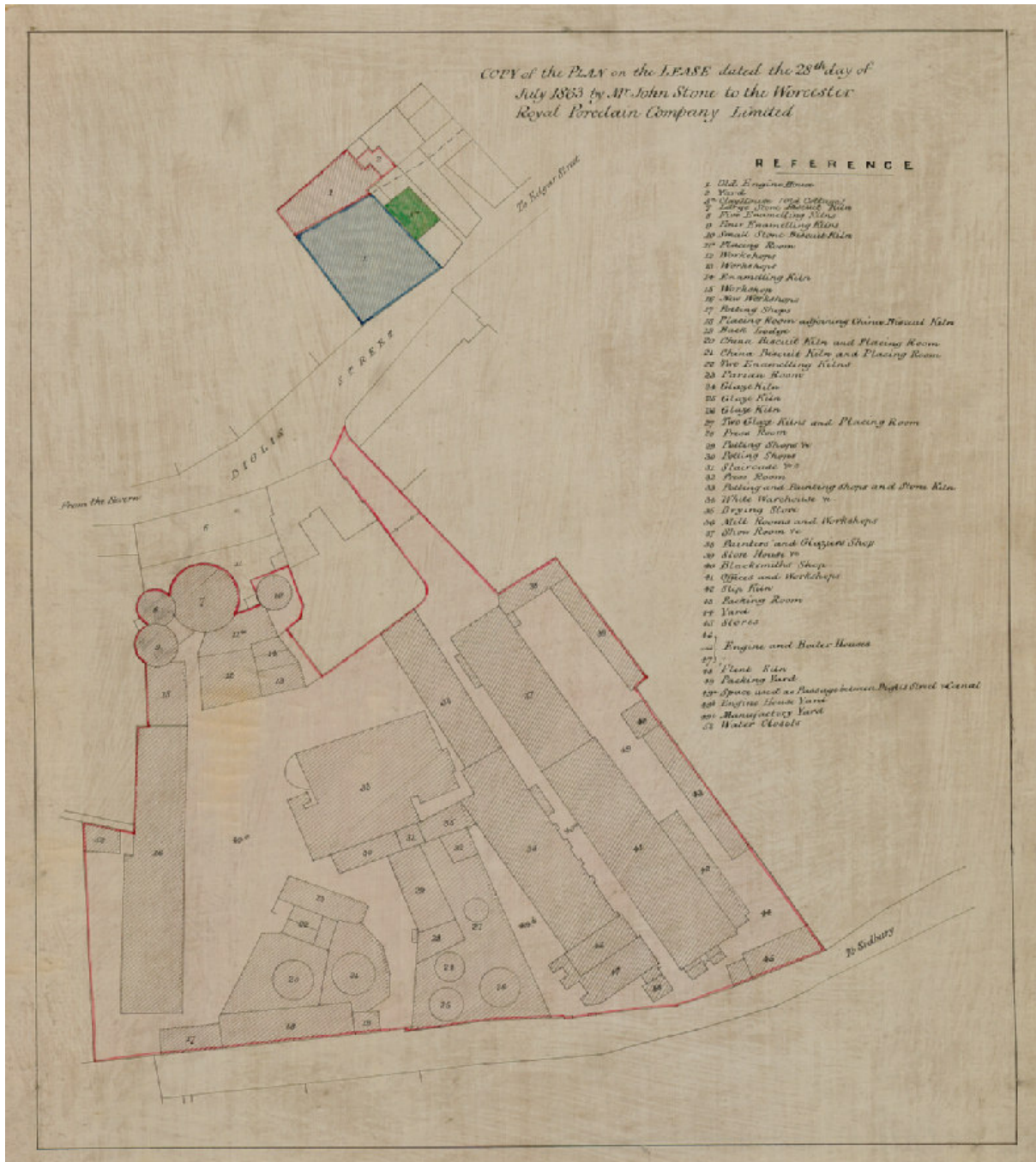


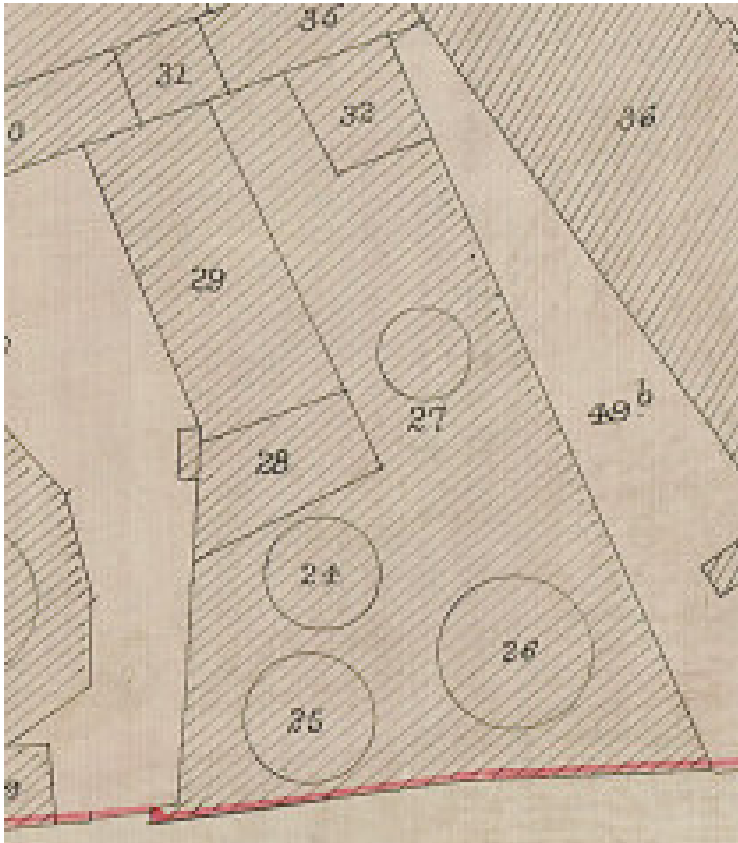
Figure 3: The Worcester Porcelain Works in 1863

Buildings E and G bottom centre (source: Dyson Perrin Museum 25.2 'COPY of the PLAN on the LEASE dated 28th day of July 1863 by Mr John Stone to the Worcester Royal Porcelain Company Limited' (source: Worcester Porcelain Museum)



**Figure 4: The location of Building E c1900**

By 1863 there were well-established elements of both Buildings E and G (Figure 4). The two buildings were separate. Although Building E had a footprint which it maintains today, by 1867 Building G had altered a great deal. In the 1930s the building was radically changed.



**Figure 5: Building E in 1863.**  
**Source: Lease of 1863 by John Stone to Worcester Royal Porcelain Works (source: Worcester Porcelain Museum).**

### **Outline history of Building E: New Throwing House**

Building E fronts onto to the fossilised lane running through the porcelain factory and it is clear from the degree of decoration to its eastern gable end to the lane that this was then the most important facade. This would suggest that the lane was still then an important thoroughfare. Despite unsympathetic modern accretions it is still a visually attractive building, though one that has been considerably altered internally.

Its overall design, generally detailing, and the roof structure is very similar to a distinct group of buildings on the site, that include Buildings K3 (Binns Building East Wing), Building R (China Decorating & Warehouse Range) and probably once Building S (Spray Glazing Range) – all the work of the George Beadmore Ford in the 1870s.

There are four basic phases to Building E – pre-1863, pre-c1877, 1878 and post-1941. A building with the same footprint, but of a very different construction from that to be seen today, lay on the site in 1863 (Figures 3 and 5) The site was acquired in June 1851 so building probably began soon after.<sup>1</sup> In 1863 (Figure 3) this consisted of three ‘Glaze Kilns’ (plots 24, 25 and 26), ‘Two Glaze Kilns and Placing Room’ (plot 27), a ‘Press Room’ (plot 28) and ‘Potting shops etc’ (plot 29). This building can just be seen from the west on a trade card (Figure 6) before 1875 when Building E was partially re-planned. In Figure 6 the area taken up by the potting shops can be seen as a smallish gable-ended building which has the appearance of the earliest of the buildings on the site.

<sup>1</sup> Worcester Porcelain Museum ‘Copied from the PLAN on the MORTGAGE dates 2 June 1875 and numbered and coloured to show the Title under which the various parts thereof are held’ (Plots 7 and 8 W.H.Kerr from John J.Field)





Figure 6: Trade Card c1870 showing Building E (source: Worcester Porcelain Museum)

By 1875 then there had been a fair amount of reorganisation (Figure 7). Although one kiln remained (Figure 5, number 27) one had been made over to a single biscuit kiln, a 'Mould Chamber', a 'Spur Room' and a 'Parian Stock Room'. The latter was probably used for storing finished 'Parian Figurines'. These were contained in a single-storey building with a corrugated-iron roof.<sup>2</sup> All this suggests that the area was dedicated to Parian production where only biscuit firing was necessary and small props ('spurs') were put together to support the appendages of statuary ware during firing.<sup>3</sup>

In 1875 the throwers and turners occupied the 1840s block to the west, but space was needed to expand. George Beadmore Ford (c1833 – 1902) of Burslem drew up plans and estimates for an alternative throwing house in 1874, but nothing came of this at the time.

2 Company Minute Book Minute 2335 (Worcester Porcelain Museum) hereafter shortened to 'Minute' (Worcester Porcelain Museum)

3 For more detailed discussion on Parian Ware see below under Building G 'Manufacturing'. Parian Ware was introduced at Worcester by Kerr and Binns and probably first made on the site of Building G.

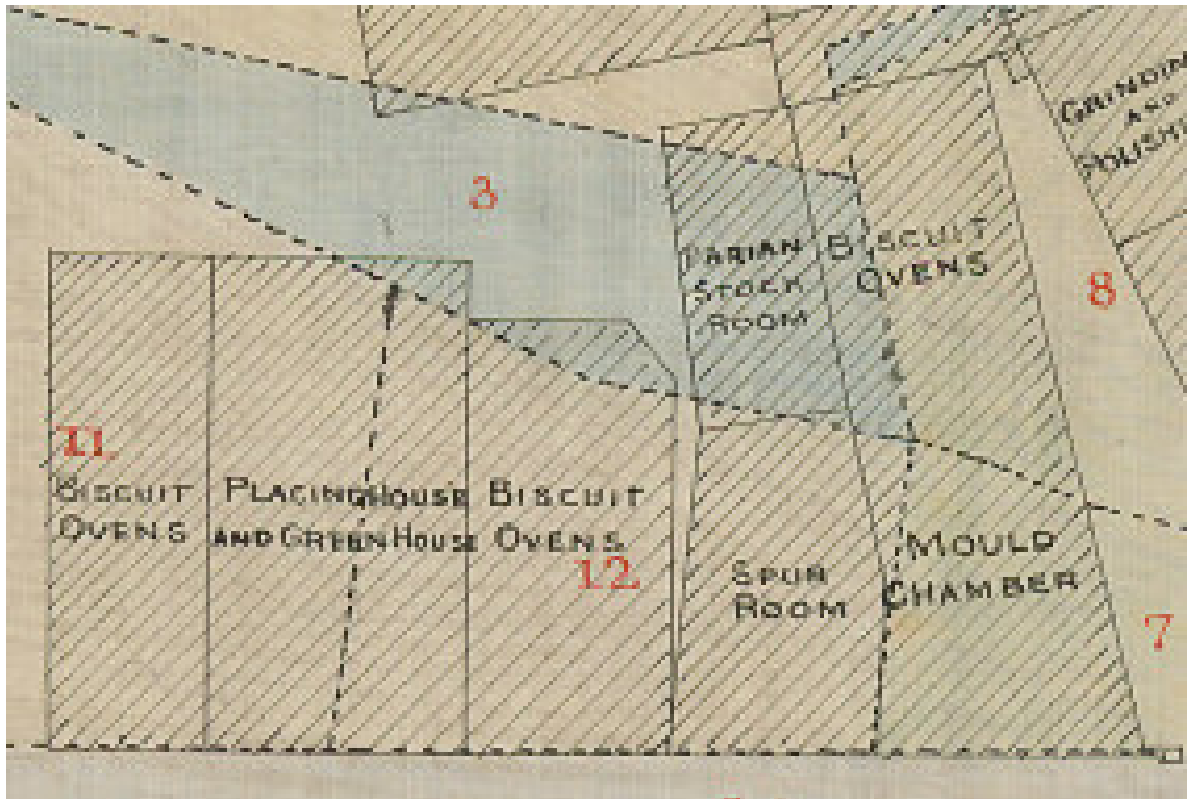


Figure 7: Buildings G (left ) and E (right) in 1875

Items 7 and 8 were purchased June 1851 and Items 11 and 12 purchased August 1854 (Worcester Porcelain Museum 'Copied from the PLAN on the MORTGAGE dates 2 June 1875 and numbered and coloured to show the Title under which the various parts thereof are held')

Following approval by company director E P Evans in November 1877, Ford produced plans for a new spacious two-storey building to be erected on the site to be known as the 'New Throwing House' which was erected in 1878 at a cost of £1,222.<sup>4</sup> (Figures 8 and 9). The history of the New Throwing House was part of the much needed re-organisation and rationalisation of the factory in the late 1870s which placed related buildings closer together. For instance, by placing the new Throwing House here it lay close to the Slip Houses (Building A) where clay was prepared.

4 Minute 2425 (Worcester Porcelain Museum)

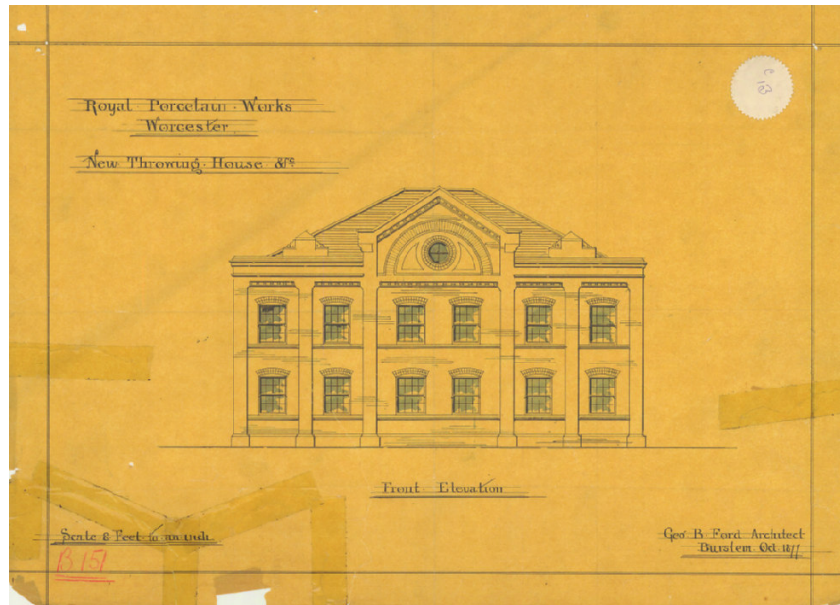


Figure 8: George B Ford's 1877 elevation for Building E (source: Worcester Porcelain Museum 25.6)

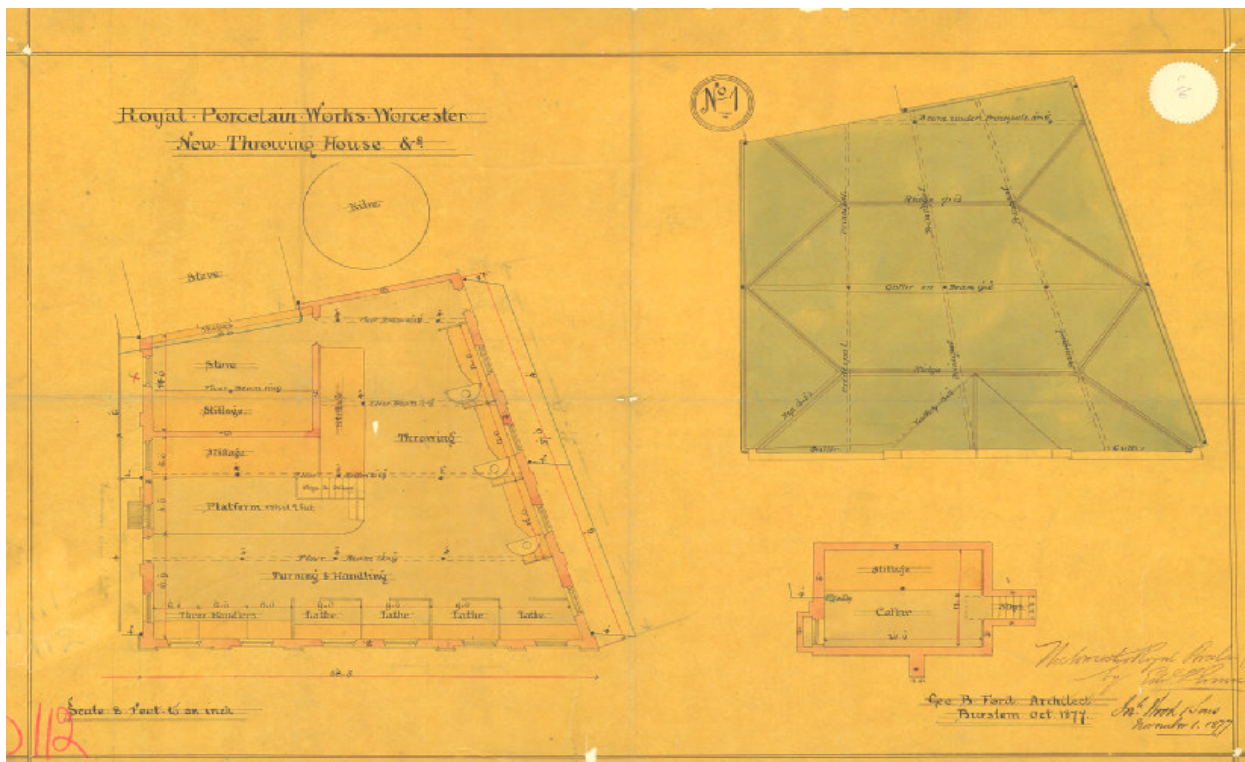


Figure 9: George B Ford's plan for Building E. This shows the ground floor (left), the roof plan (right top) and the cellar plan (right bottom) (source: Worcester Porcelain Museum)

This new building set a high standard and although with basic painted brick work internally, the rooms were heated by steam pipes and had plenty of daylight and space. The elevation which fronts onto Prince's Drive remains much the same today (Figure 8). The extension to the rear (towards the west) was not included in the main development of Building E but added later. At the time of Ford's plan this is where a kiln lay (Figure 9) but as built by 1884 it was matched into Ford's design by extending the north wall of E and giving it a similar styled facade (for placement see Figure 10; plot 69). But this makes up only approximately half of the west extension (for placement of this see plot 70). This was the area which made up the pre-1863 potting shop and pre-1875 Parian Stock Room. Although still intact in January 1941, in the same year a kiln based on Building G was planned to encroach onto the area. Thus the scene was set for the developments we shall see on Building G in the mid 20th century.

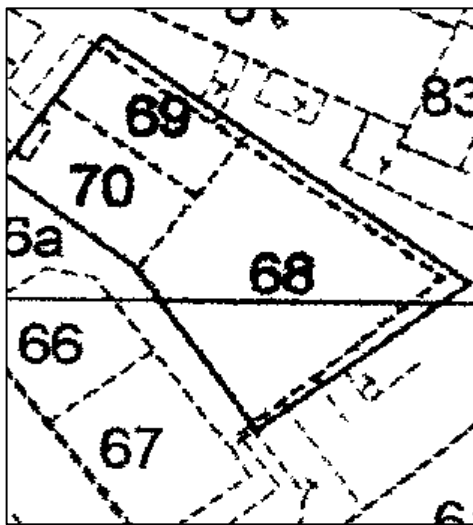


Figure 10: Detail from a numbered plan by Sam N Cooke (Chartered Surveyor, Sun Buildings, Bennett Hill, Birmingham). It is dated January 1941 (source: Worcester Porcelain Museum). The number 68 corresponds with the 1877 plan.

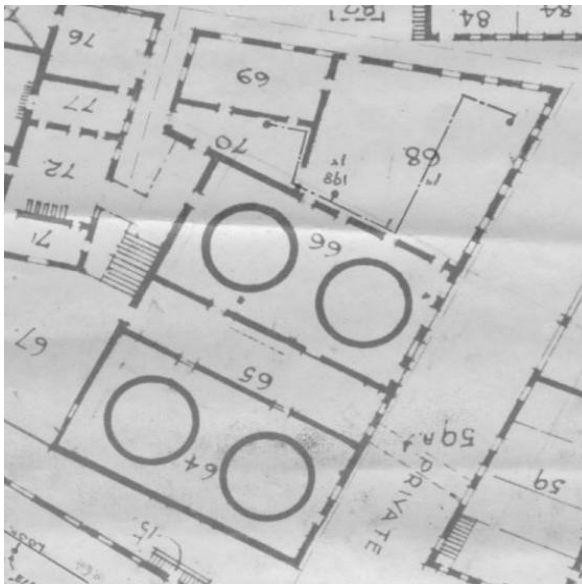


Figure 11: Detail of a revised plan by Sam N Cooke of 1941. This shows the encroachment of Building G into the area of E (source: Worcester Porcelain Museum)

### **Building E within the context of the Royal Worcester Porcelain Works**

The original building was in place by 1863 and might have been part of the expansion which took place under Kerr and Binns in the 1850s which included the Show Room, Bone Mill (D) and Building J.<sup>5</sup> Together with the Building G (phase 1) it therefore occupies the area between two established arms formed by the fan. Building E (phase 1), with its distinctive footprint, is therefore likely to have been built a little later than Building D.

### **Manufactory and use in Building E**

Although Robert Williams Armstrong was possibly the architect for the Phase 1 Building E, and in spite of a strict curtilage, it seems likely that this phase saw little more than a standard potworks group with an outside wall containing the whole. Access appears to have been through a single entrance as seen at plot 28.

There are four basic phases to Building E – pre-1863, pre-c1877, 1878 and post-1941. A building with the same footprint, but of a very different construction from that to be seen today, lay on the site in 1863 (Figures 3 and 5) The site was acquired in June 1851 so building probably began soon after. In 1863 (Figure 3) this consisted of three 'Glaze Kilns' (plots 24, 25 and 26), 'Two Glaze Kilns and Placing Room' (plot 27), a 'Press Room' (plot 28) and 'Potting shops etc' (plot 29). This building can just be seen from the west on a trade card (Figure 6). Before 1875 when Building E was partially re-planned. In (Figure 6) the area taken up by the potting shops can be seen as a smallish gable-ended building which has the appearance of the earliest of the buildings on the site.

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5 Figure 2 shows that the western part of Building J, on the top left hand corner, was built by 1842

Thus the whole arrangement was similar to Gladstone Pottery, Stoke-on-Trent (now a museum) where shape was dictated by the land available. Only the potting shop (apart from the four glazing kilns where secondary firing took place) was above a single storey. The two press rooms, where hollow ware was pressed into moulds (Figure 12), may have been single-storey sheds. The single-storey covered area around the kilns would have been used as place rooms (Figure 13).

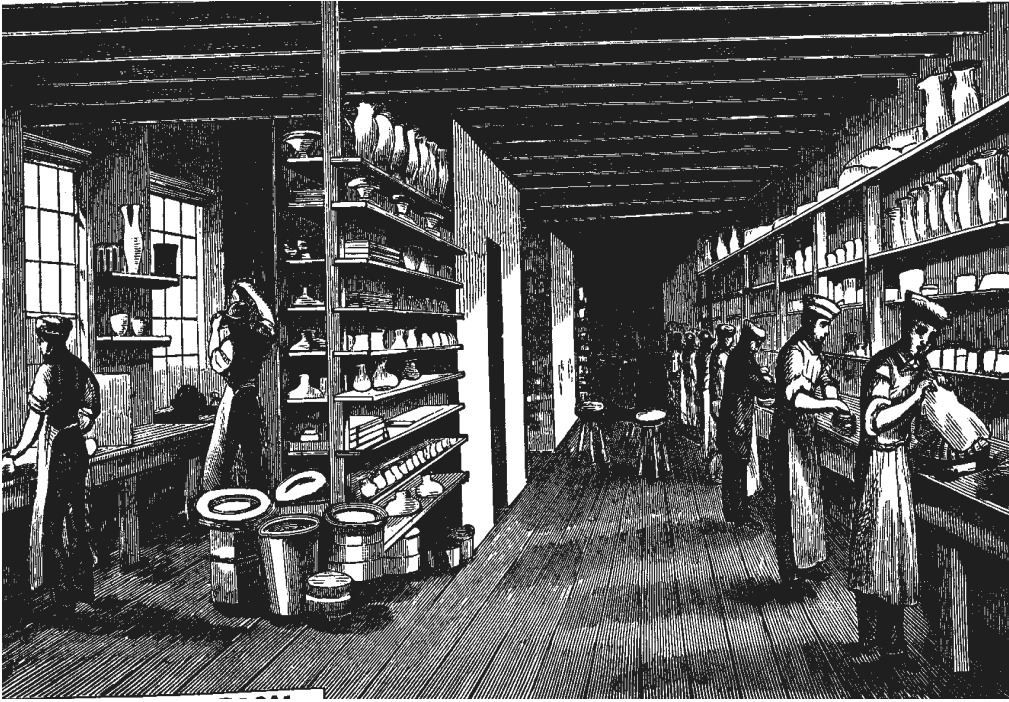


Figure 12: Pressing Room at Royal Worcester (source: Guide 1875)

The kilns were noted in 1863 as being for glazing, thus the primary firing in biscuit kilns must have taken place in Building G, where there were two in 1863, and then brought back to E for secondary firing (see Building G below). This begs the question where the dipping room lay. By 1875 Parian Ware was being produced which involved moulding the figures and biscuit firing only.

Under Ford the remaining kiln was done away with by this completely new building devoted to throwing which was part of the rationalisation of the factory into departments by bringing the kilns into one area (Building G) and concentrating throwing into one building close to the Slip House (Building A).



Figure 13: A Placing House (source: Guide 1875)

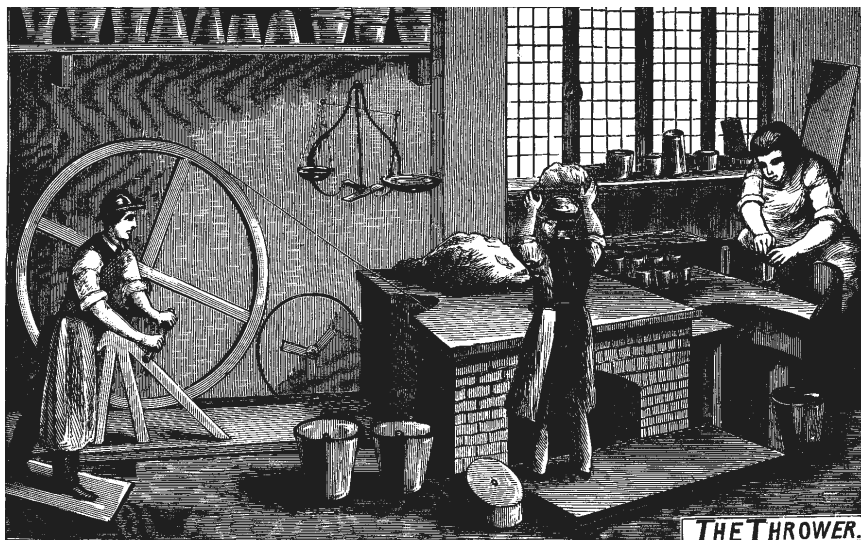


Figure 14: Throwing work (source: Guide 1875)



**Figure 15: 'Throwing' in Building E**

**Hung on the wall to the thrower's right, are a series of wooden profiles or ribs – small tools used by the thrower, shaped to fit either the inside or outside of a particular vessel, allowing the thrower to create an exact shape of neck or foot (source: Worcester Porcelain Museum).**



**Figure 16: A boy assisting at a turner's lathe c1900 (source: Worcester Porcelain Museum)**



On the ground floor there were three work benches for hand throwers each under a north-facing window (see Figures 14 and 15 and compare with Figure 9), three benches for handlers and four lathes for turning pot bottoms and for Jiggers to make plates and other flatware over hump moulds. Against the east wall were four lathes which were used by the turners. The turner worked on clay in its green or partially dried state. Using a lathe the turner would even out the foot ring or lips of vessels and remove any irregularities in the hand-thrown piece.

The wheels and lathes were turned by young boys who often worked and learned a trade from their fathers (Figure 16). The Directors considered the introduction of a small engine and machinery to drive the turners' lathes and throwing wheels in October 1877 but the potters were against it.<sup>6</sup>

In July 1886<sup>7</sup> new drive shafts for machinery for the throwing house was paid for – they obviously had accepted the new technology!

In the narrow part of the room and the centre, there were a large number of wooden 'stillages' or adjustable shelves used for drying out pots to a green state before turning and their first, or biscuit, firing. A small cellar under the centre of the building was probably used for extra mould storage.

The first floor of the New Throwing House was used as a stock room for ornamental wares from the beginning (Figure 17).<sup>8</sup>

In the 1940s the wall between the side part of E and G was removed and the whole of the first floor was reorganised but in 1946 the ground floor was used as the Jollyng Department in the manufacture of a Fireproof Ware – this was the forerunner to hard porcelain.<sup>9</sup> Jollyng is the hand-making process for the formation of hollow ware vessels (such as casseroles and cups) by the pressing of a slab of clay into a revolving plaster of Paris mould. Oval shapes especially deep oval dishes, tureens and sauce boats were traditionally made by hand jollyng. The department also had its own pug mill for squeezing any remaining air from the clay, sticking up benches for adding handles and mould dryers for drying out the plaster moulds to speed up their re-use.

In 1988 the ground floor of E was used as a basin shop and the first floor was a mould store. In the 1990s the narrow part of E was used for offices and the wider part of the building was opened up into a large space (opening into G) for the packing department.

After the New Throwing House was built Parian production must have moved elsewhere and its likely location would have been to K3 where there were new biscuit kilns and the prestigious museum.

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6 Minute 2335 (Worcester Porcelain Museum)

7 Minute 3527 (Worcester Porcelain Museum)

8 Minute 2470 (Worcester Porcelain Museum)

9 Worcester Porcelain Museum Drawing WRP 8



Figure 17: The first floor of Building E c1900 used for display (source: Worcester Porcelain Museum)

### Buried archaeology

Building E is to be retained but disturbance below floor revealed a cellar which appears on the original architects' plan design (Figure 18) and this was found almost empty with few shelves and moulds which were recorded during the building survey. The cellar had a common outer wall on the south with a light-well for illumination.

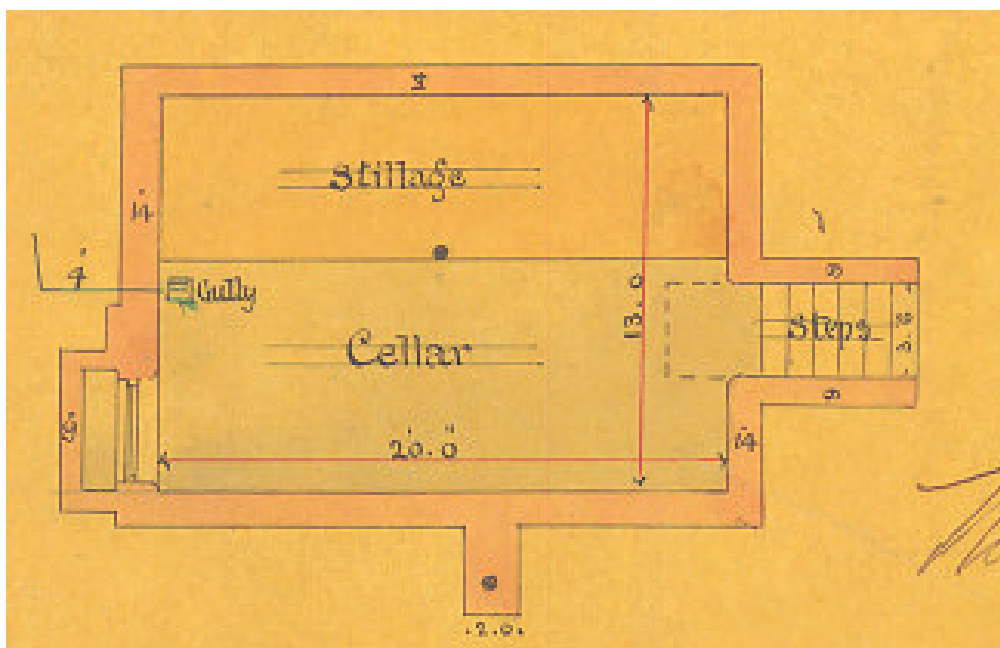


Figure 18: Cellar plan of Building E. Extract from 1877 architect's drawing (source: Worcester Porcelain Museum)

### Outline description of Building G: Finished Goods Warehouse

The present Finished Goods Warehouse (Figure 19) contained four kilns – their positions reflected by the design of the framing of the first floor structure. To the west is a later, mid 20th century, flat-roofed range (Figure 20) now used as a retail shop (to be retained), and to the north, Building E.



Figure 19: Building G from the south-east. The lean-to was built after 1964



Figure 20: Detail of steel framing on Building G



Figure 21: The post-1964 single-storey run in front of Building G from the north-east

### Outline history of Building G

There are four main phases to Building G – pre-1863, c1867, 1935 and 1941. The first phase probably began soon after August 1854 when the land was acquire in 1863. Figure 22 shows that there was an assortment of structures within the area later occupied by Building G. The loosely semi-circular boundary of the area occupied by one of the two 'China biscuit kiln[s] and placing room[s]' shown on Figure 22, plot number 21, suggests that four adjoining catslide roofs ran downwards from the circular hovel to meet four corresponding walls. This appears to be an unusual, but obvious, way in which to locate a place room so that it surrounding the kiln and avoided the back lodge which lay here.

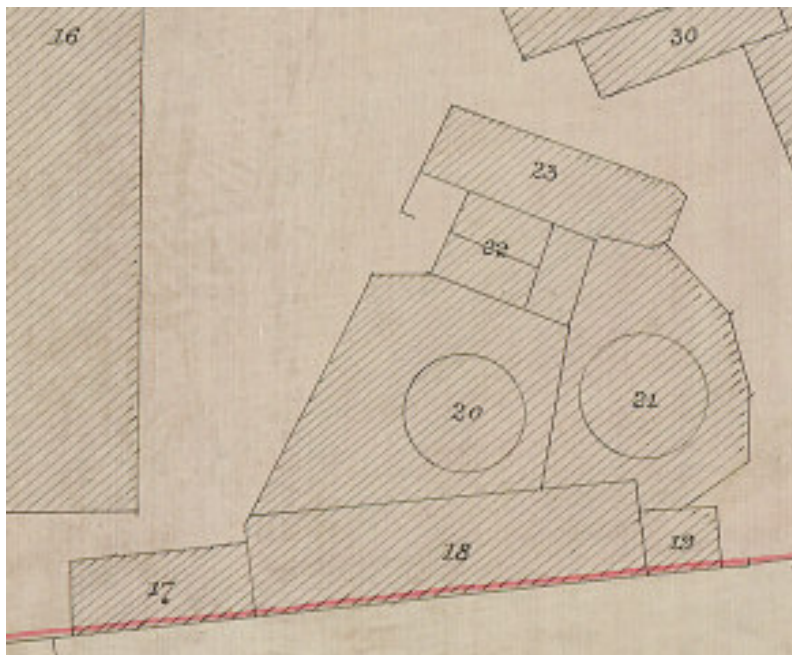
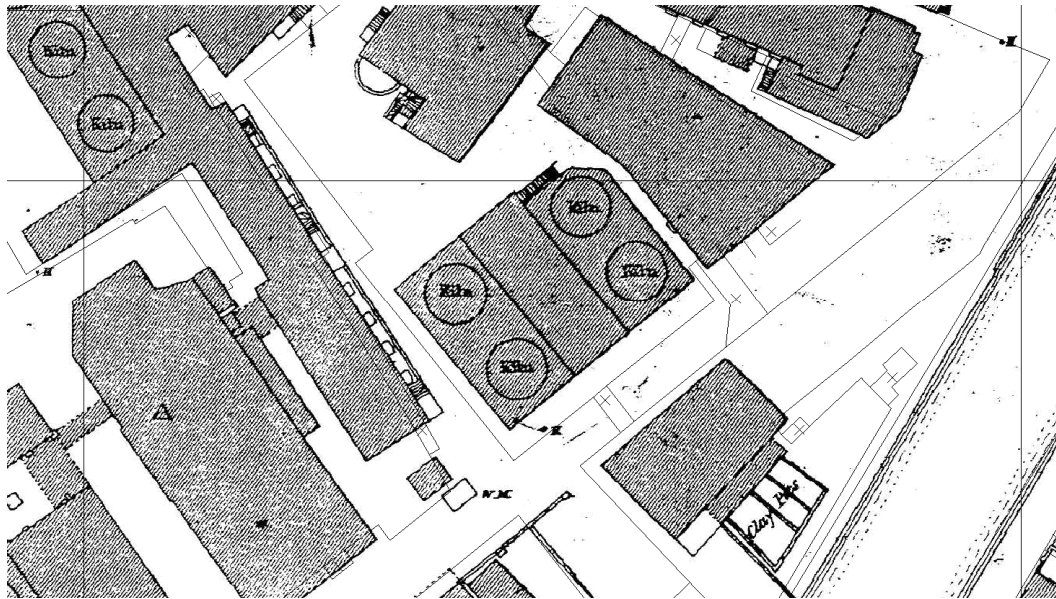


Figure 22: Building G in 1863. Source: Lease of 1863 by John Stone to Worcester Royal Porcelain Works (source: Worcester Porcelain Museum)



**Figure 23: Extract from OS map 25in to 1 mile of 1884 showing Building G with the four kilns**

**There was an additional China Placing Room at plot number 17 (Figure 22). The other China Biscuit Kiln (20), lay in a clearly defined building with, to the west, 'Two Enamelling kilns' (22) and 'Parian Room' (23).**

The 'Back Lodge' was a small building next to gates set in iron railings that separated the factory from the road and canal-side. Here the Lodgeman ensured that no goods or workers left the factory other than at specified times. Security was of high importance as the workers were creating luxury objects of very high value that they could never afford to purchase themselves. Expensive raw materials such as gold, mercury and cobalt also had to be carefully monitored.<sup>10</sup>

This cluster of pre-1863 buildings soon became very cramped as the success of the business grew and although Royal Worcester needed to expand rapidly they were very cautious because of the huge costs involved and the problems that were created with the disruption of production. Often projects were adapted or only partially completed.

This latter point may account for an anomaly which suggests the next stage was completed by 1867 when the Board of Health plan was produced<sup>11</sup> showing the footprint as similar to that known in 1875 (Figure 7).

What follows might suggest that a date for completion of the rebuilding is more likely to have been 1875 rather than earlier. In November 1874 it was reported that the foundations were ready for one 16ft and one 14ft kiln to be built to 'Minton's Patent plan' at a cost of £250.<sup>12</sup> But by 1875 this building had four biscuit bottle kilns with a central 'green house' for slow drying and a 'placing house' (Figure 7) where the porcelain was placed into the saggars and sorted ready for firing.

10 The lodgeman and timekeeper George Willoughby died in March 1884 after 30 years in the job. Many youngsters started their career at the factory as a 'Lodge boy'. Lodge boys ran errands and took messages from one department to another. In the later 20th century they also sorted out the post each morning, sorted clocking in cards etc. The tradition at Worcester continued until the early 1980s.

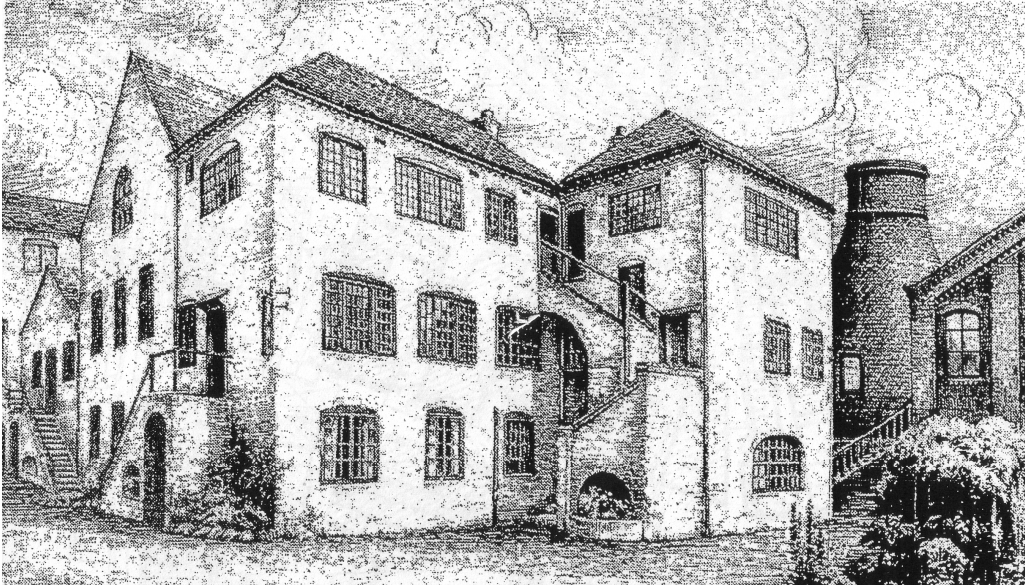
11 Worcester City Board of Health Plan 1867

12 Minute 1961 (Worcester Porcelain Museum)

The rapid follow-on from two to four kilns suggests that by 1867 the footprint was established with two kilns and, that the two Minton kilns completed in 1875, were additional ones. Whatever the case, the site was now fully occupied and the Lodge was then moved to the new factory boundary at the end of the ancient road where developments were established in the areas of Buildings W, Y and Z. Figure 24 shows an elevation of Building G with the four kilns and the gable-ended placing house and green room (see also Figure 7), and Figure 25 shows one of the north kilns and the two-storey placing room with slightly more detail of the central building. The characteristics are typical of G B Ford of Burslem.



Figure 24: Building G as completed in 1875 (source: Guide 1875)



**Figure 25: The early Chamberlain 's Works with one of the kilns of Building G in the background**

**One of the two north kilns of Building G is shown with (right) the central gable-ended building (source: Worcester Porcelain Museum). The heat bottle kilns were subjected to constant expansion and contraction of the bricks in the kiln hovels and cones. This gave them a life span of only around 20 years and they needed regular rebuilding and repair work. During the 1870s and 1880s the biscuit kilns were altered and rebuilt on many occasions.**

Following a devastating fire caused by one of the bottle kilns in the range behind Building J in November 1879 and a claim made on the Company's fire insurance, the roof of 'the new oven shed' was replaced with a galvanised corrugated-iron roof at a cost of £163.<sup>13</sup>

The biscuit bottle kilns which occupied this site (between two and four at any one time over the 90 years between 1863 and 1953) were rebuilt several times.

These changes are difficult to detect and on first appearances even the site as shown in 1941 (Figure 36) suggests that this is basically the 1875 building with four surviving kilns from that period. In fact Building G had been completely rebuilt in stages from the early 1920s, but roughly on the footprint of the earlier building. The exterior of the building we see today is the shell of that built by Dyson Perrins when he rescued the works in the mid-1930s but with some middle-aged spread.

How this was arrived at is a varied journey. In the early 1920s Royal Worcester experimented with gas-fired biscuit kilns. The first gas biscuit kiln was installed by January 1920 and proved very successful. The second was ordered in February 1921 but where (or if) built we do not know. Materials were in very short supply and even re-used bricks from the demolished bottle kiln which it replaced; it took over a year to obtain all the materials and the relevant building permits to build it (Figures 26, 27 and 28 illustrate the type of kilns built).

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13 Minutes 2699, 2646 (Worcester Porcelain Museum)

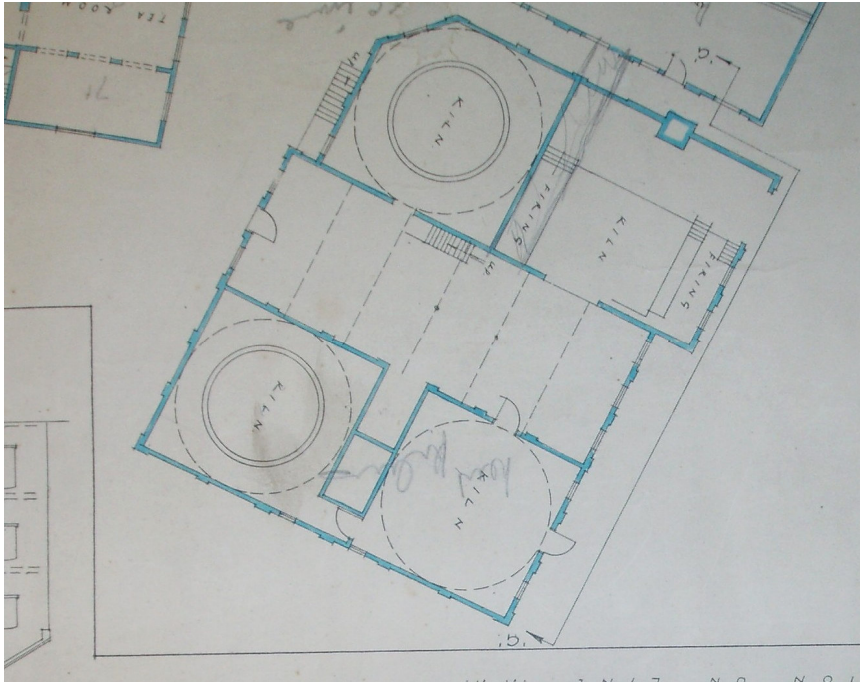


**Figure 26: The gap between the kiln and hovel at Building G (source: Worcester Porcelain Museum)**



**Figure 27: Inside a kiln at Royal Worcester showing the firing holes (source: Worcester Porcelain Museum)**





**Figure 28:** The rectangular kiln is the 1920s gas kiln (source: Worcester Porcelain Museum Drawing 20495/1 - Sam N Cooke September 1934)

The story of how this pre-war adaptation occurred is complex. Figure 28 shows the 1934 footprint with a stepped east front.<sup>14</sup> This step was one of the rectangular gas kilns installed in the 1920s (the elevation is shown in Figure 29).

Under the ownership of C W Dyson Perrins, Royal Worcester was desperate to update the factory in the 1930s and make it more efficient, but it could not afford to demolish many old buildings or kilns at once. Production had to be maintained, therefore alterations were staggered.

This is reflected in Royal Worcester's lack of confidence in the new technology so that when Sam Cooke (now the established company architect) produced plans for new kilns on Building G in March 1935 they were for bottle kilns (Figures 30 and 32). Even so, they were of a radically new kind which were transferred into a blueprint by a local firm Heenan Froude Ltd by May 1935 (Figure 31). The 1920 gas-fired kiln was not immediately demolished as can be seen in Figure 29. Figure 28 shows the two southerly kilns being built but leaving the gas kiln alone for the time being.

The plans produced by Cooke (28, 29, 30 and 31) suggest the kilns were to be built in two stages – firstly the two southerly ones followed by the northerly which lay where the surviving north-westerly kiln lay and the gas kiln. The two southerly kilns were built first but the northerly ones were not built until 1941 and extended the 1875 footprint into Building E (Figure 35). The revolutionary-shaped kilns had tall chimneys rising from the hovels which, no doubt, provided for a better draft. Rolled-iron gable-roofs (two kilns to each) with long vents were built and the kilns completely enclosed in the buildings apart from the chimneys which poked out through the roofs. It was over this period (1935 to 1941) that Building G obtained its modern east and south elevations. The main structure was steel framed as seen during its construction around 1935 (Figure 33 and 34).

<sup>14</sup> By 1941 there had been further changes so this cannot be an accurate picture of what was here then but it is shown on 'Schofield Co Incorporated Insurance Brokers Royal Mail House, Manchester and London January 1936' (Worcester Porcelain Museum)

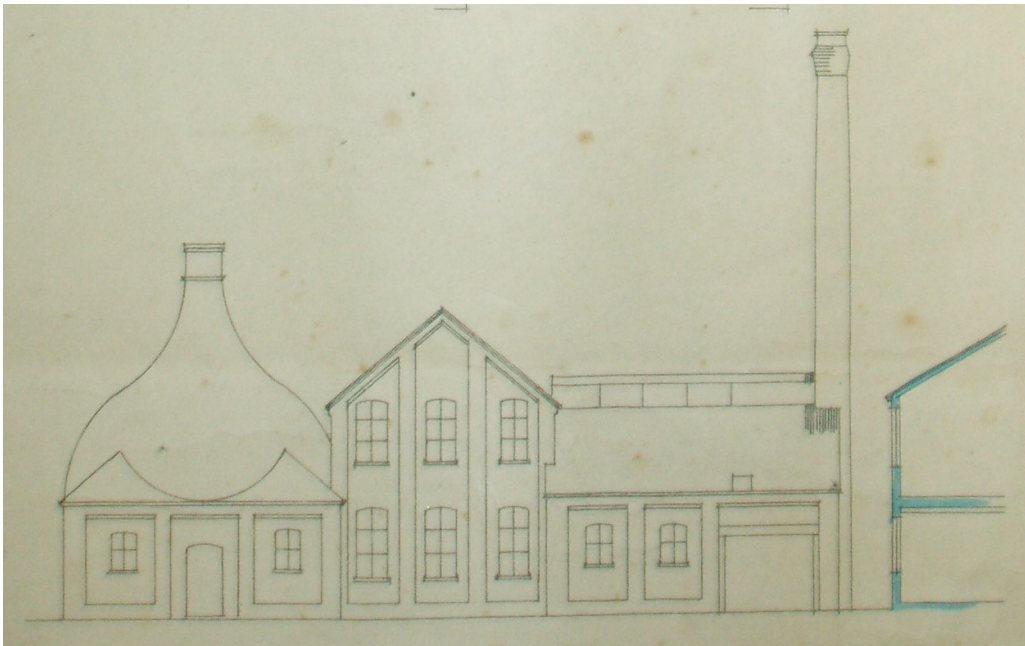


Figure 29: The 1920s changes to Building G (east elevation) as designed in September 1934 by Sam N Cooke. The rectangular kiln is the 1920s gas kiln (source: Worcester Porcelain Museum).

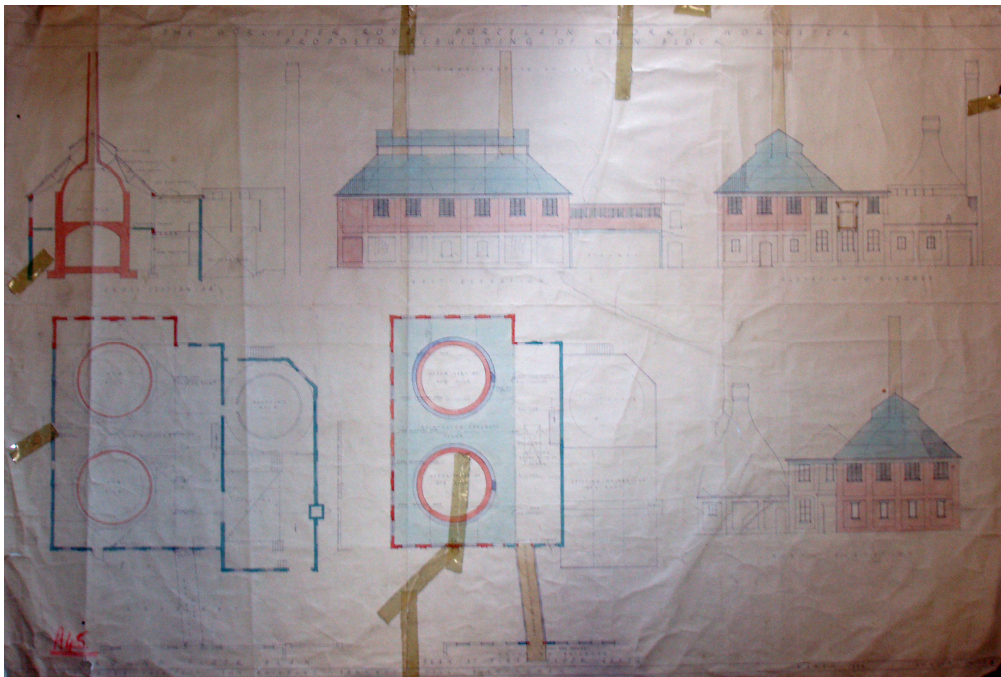


Figure 30: Building G proposed rebuilding of southerly kilns March 1935 by Sam N Cooke (source: Worcester Porcelain Museum 20719/3)

Increases in the price of coal (up by as much as 50% in the 1930's) had driven the Directors to think again about the possibilities of electric and gas-fired kilns, but the idea lay dormant for some years.<sup>15</sup> When the idea was revived it was for an electric-fired glost tunnel kiln in Building O operated by the Welwyn Electric Company for the Ministry of Aircraft Production which was installed in 1941.

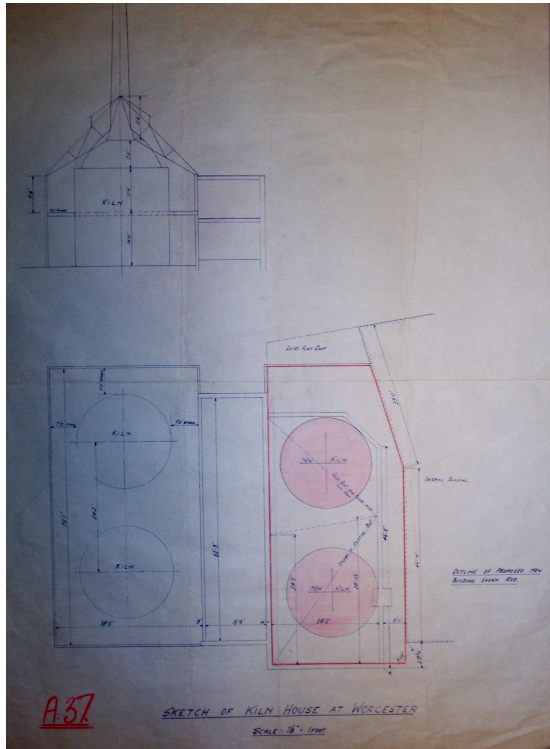


Figure 31: Building G. The new kilns as planned in May 1935 by Heenan Froude Ltd (source: Worcester Porcelain Museum A39).

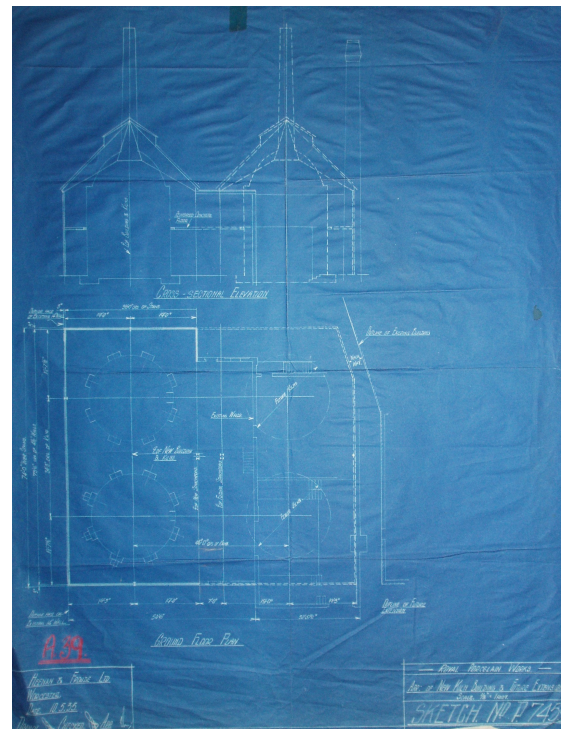
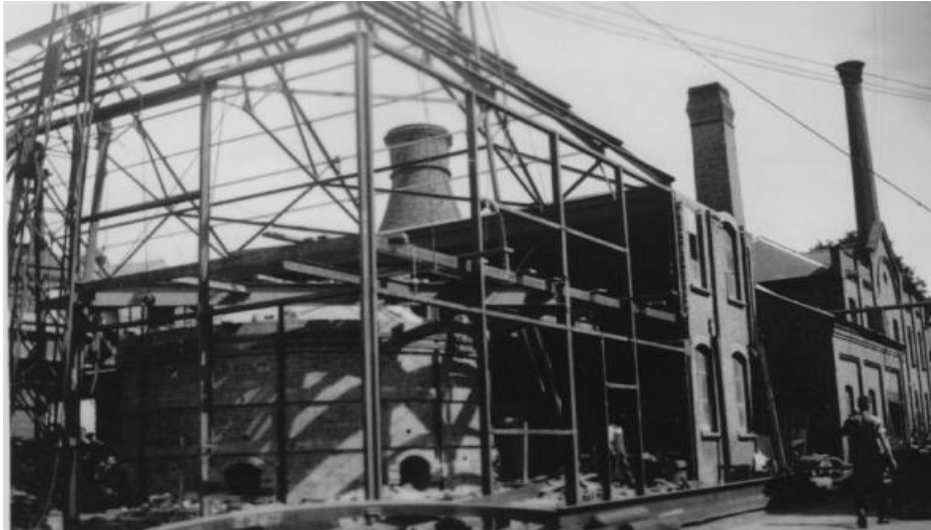


Figure 32: Building G proposed rebuilding of northerly kilns by Sam N Cooke in 1935 (source: Worcester Porcelain Museum A37)

15 Minute 129 January 1936 (Worcester Porcelain Museum)



**Figure 33: Building the new south-easterly kiln c1935**

**A diamond-shaped steel frame was built inside the main structure to support the kiln which can just be seen. The rectangular kiln shown in Figure 28 projects into the drive with Building E beyond to the right (source: Worcester Porcelain Museum).**



**Figure 34: Building G. Building the south-westerly kiln c1935**

**The building behind to the right is K1. One bay of the former Place House has been removed – note the projecting porch behind the left steel member. The square stack to the gas kiln can be seen as well as the north-western bottle kiln. Comparison with Figure 28 shows that the north part of G was untouched (source: Worcester Porcelain Museum).**



Figure 35: Building G in 1936 (source: Schofield's Insurance Plan of 1936 Worcester Porcelain Museum)

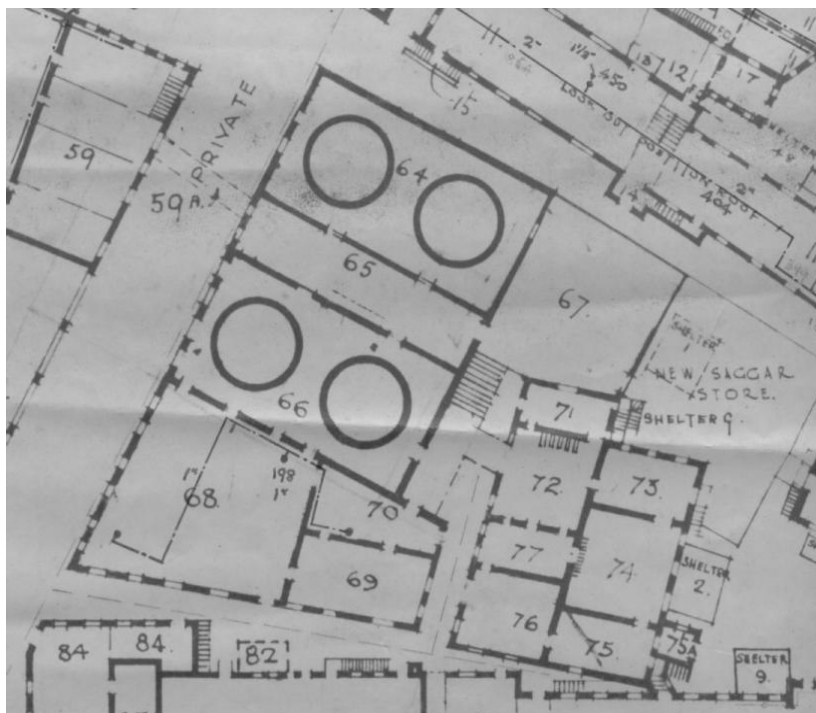
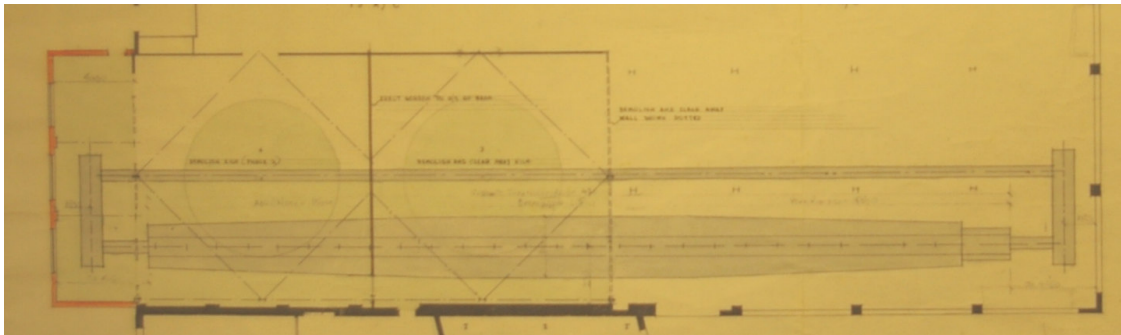


Figure 36: Detail of a revised plan by Sam Cooke of 1941 (source: Worcester Porcelain Museum)

In December 1942 Managing Director Joseph Gimson reported subsidence of the foundations of the two porcelain kilns built in 1935 – 1936, and that they needed rebuilding. At the same time Royal Worcester were approached by the Ministry of Aircraft production for additional accommodation at the factory in connection with the Steatite project. To accommodate them ‘the demolition of the old Chamberlain block of buildings as well as extensive alterations and construction...’ were proposed.<sup>16</sup> The footprint of such a proposal was in the offing as a new temporary single-storey saggar store to serve the four kilns which had been constructed to the west. As it turns out the bottle kilns continued to function and it was probably not until around 1945 that the new two-storey building was constructed as part of the post-war reconstruction of the factory.

The wartime electric tunnel kiln in Building O had shown the way, but gas tunnel kilns appear to have been untried. There were rumblings about a post-war gas kiln in 1945 when a plan was prepared showing one in Building G (Figures 37, 38 and 39). But it was not until 1947<sup>17</sup> that this bore fruit when the foundations and gas supply for a china biscuit tunnel kiln were installed to run the full length of Building G adjacent to the north wall next to Building E.<sup>18</sup> Over a long period steel housing was erected, materials ordered and so forth, but it was not until the kiln was finally lit on Wednesday 10 May 1950 that gas-fired tunnel kilns were vindicated.<sup>19</sup> At this time the Chairman was able to report that the results were so much better than in the coal-fired china biscuit intermittent ovens and submitted quotations for their demolition at a cost of £250.<sup>20</sup> A local paper reported in April 1950 ‘Now being constructed at Worcester at a cost of £50,000 is a new gas fired tunnel kiln of a highly original design. It is intended that it will eventually replace the old type bottle kiln’. The kiln had deep, walk-under inspection pits for kiln repairs to take place during continuous firing. The tunnel kiln is shown being built, completed and in production in Figures 40 through to 43.



**Figure 37: The 1947 to 1950 tunnel kiln in Building G**

**Note the ‘ghosts’ showing the position of the removed bottle kilns (source: Worcester Porcelain Museum)**

- 16 Minutes 302 and 305 December 1942 (Worcester Porcelain Museum). See Figure 44 numbers 71 to 76, 67 and the Saggar House.
- 17 Book 12. Minute 159 19.12.1947 (Worcester Porcelain Museum)
- 18 Reidhammer kiln
- 19 There is a photograph of a kiln in the Worcester Porcelain Museum captioned on the back “April 1950. Now being constructed at Worcester at a cost of £50,000 is a new gas fired tunnel kiln of a highly original design. It is intended that it will eventually replace the old type bottle kiln”.
- 20 Minute 963 – 9.2.1951) and Minute 989, 16.2.1951 (Worcester Porcelain Museum)

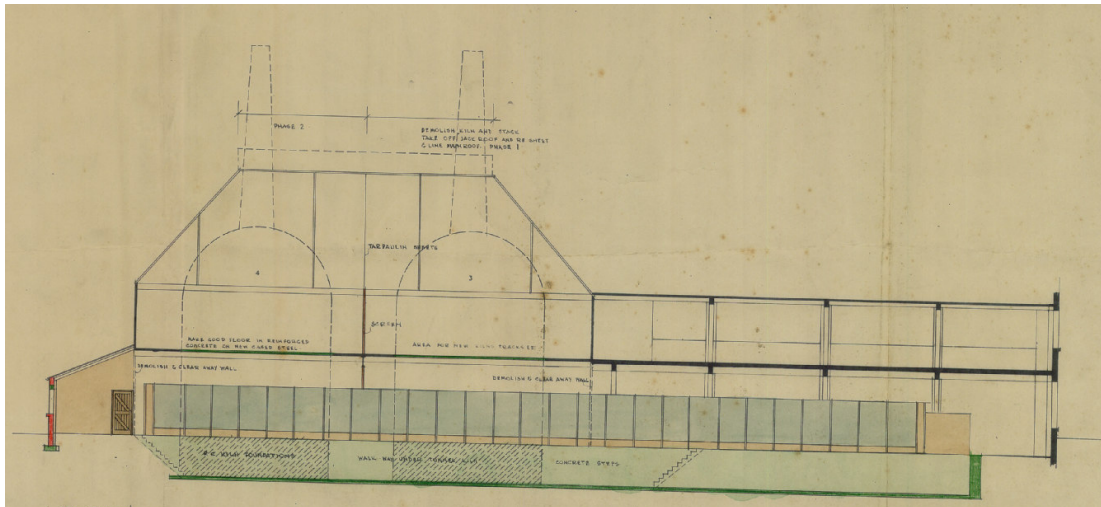


Figure 38: Building G north elevation in the 1950s showing the tunnel kiln and inspection chamber underneath (source: Worcester Porcelain Museum)

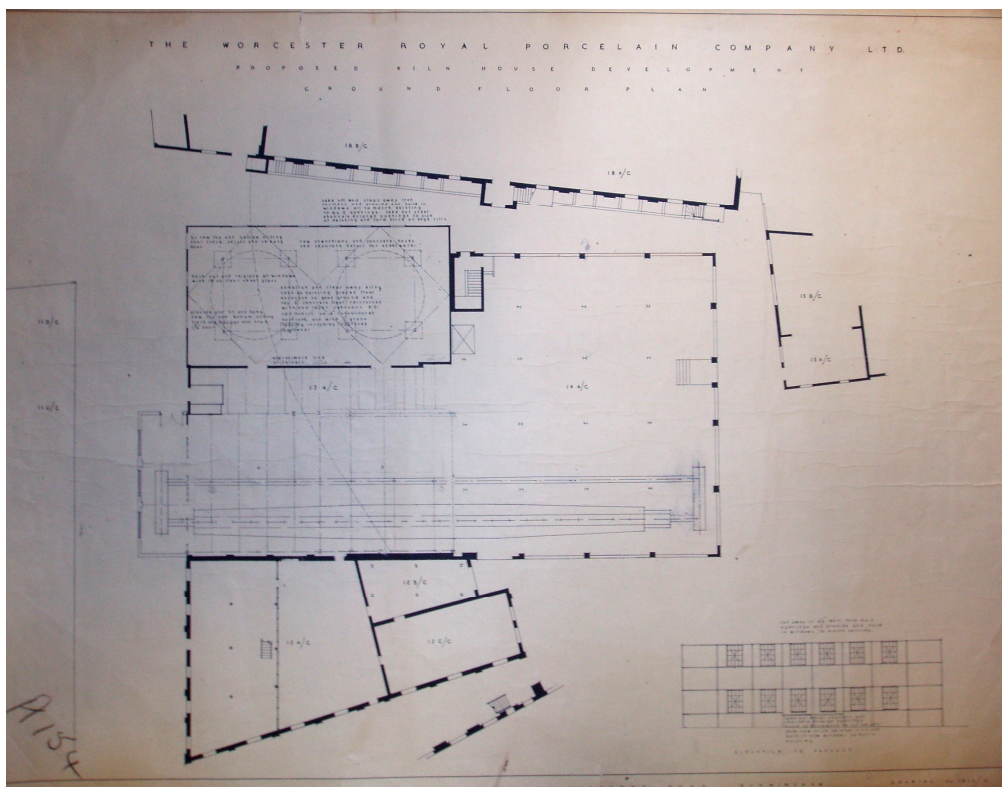


Figure 39: Building G. Post-war redevelopment

This shows a tunnel kiln (presumably in the planning stage) running the full depth of Building G into the rebuilt of the early Chamberlain workshops. Building J lies at the top with Building E at the bottom where it joins G. The bottle kilns lie at the top left (Worcester Porcelain Museum by S N Cooke February 1945 5932/6).



**Figure 40: Construction of the Reidhammer tunnel kiln in G c1947 – 1950**

**In spite of the intention to demolish the bottle kilns they were still available for production in 1951 (Figure 43) and were not dismantled until late 1953 and the gaps left by them in the first floor were not properly covered until after October 1964<sup>21</sup> (source: Worcester Porcelain Museum).**



**Figure 41: Pushing a loaded kiln truck into the new kiln. This would cause another truck to emerge from the far end of the kiln (source: Worcester Porcelain Museum).**

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21 Planning Department Worcester City Application 17032 (S N Cooke/G W Costain & Partners Drawing No 134/s October 1964)





**Figure 42: The interior of the Reidhammer kiln. Fire bricks were constantly replaced (source: Worcester Porcelain Museum).**



**Figure 43: For a couple of years the old and new kilns sat side by side in the same building (Figure 39) This photograph taken around 1950 – 51 shows saggars for the bottle kilns sitting next to the side of the tunnel kiln on the left (source: Worcester Porcelain Museum).**

The ugly lean-to projecting into Prince's Drive from Building G (See Figure 44) was originally a small extension to cover the end of a new tunnel kiln.<sup>22</sup> This may tie in with a 1962 drawing suggesting that the Reidhammer kiln was replaced with a Glost tunnel kiln. This add-on was extended after March 1966 when a whole number of changes to Building G were considered by the Planning Authority.

In the 1980s the ground floor is known to have housed the glost tunnel kiln and associated inspection department, while the first floor housed the porcelain biscuit kiln and porcelain fettling and dipping departments. This was linked to other hard porcelain departments in Building F and H by a bridge where, with Buildings G and E, all hard porcelain production was concentrated from the late 1940s until the late 1980s when the whole factory was rationalised and all hard porcelain production was moved to the Portland Factory.



**Figure 44: The post-1964 single-storey run in front of Building G from the north east. The building break where the line was extended beyond to the south can just be seen beyond the second window.**

In the 1990s the ground floor of Building G was used as a China Finished Goods Warehouse, with a small extended section next to the courtyard used as a clearance shop.

In spite of all these changes, by 1947 at the latest, Building G with part of the early Chamberlain workshop formed a single block into which they had been rationalised. Even so, in 2006 Building G retains some vestige of its character having the two 1930s hipped roofs over the areas where the kilns lay and the semblance of a central block somewhere on the footprint of the placing house. As a testimony to its former state the remnant of one pilaster from the 1875 building can be found incorporated into the new building.

From the sources illustrated here, plus evidence from the two facades at the east and west of Building E, a good attempt could be made to recreate a reasonable copy of the front as it was facing Prince's Drive – this would complete the historic frontage along much of this fossilized road.

22 Worcester City Council Planning application 17302 15 November 1963

### Some observations on manufacturing in Building G

The biscuit kilns were for primary firing. The 'Greenware', once dried would have been taken from the place room to the kiln. The semi-circular place room surrounding plot number 21 in 1863 is particularly interesting. Similar practice can be found in 17th century blast furnaces and with horse gins set against barn walls. Following the complete rebuilding, the two sets of two kilns lay either side of the placing house providing convenient access either side of the 'wickets' into each kiln. To reach the upper storey 'dumb waiters' were possible used (movable shelves like a lift onto which pottery was placed – the weight of down-coming shelves lifted those from below).

The rebuilding of the kilns, which started in the 1920s with gas-kiln trials and reached its climax in the mid-1930s, shows a drive towards greater efficiency and cost saving, particularly on coal, under Dyson Perrins. But these were tentative steps because production had to continue alongside innovation. Gas-fired kilns were soon dropped and tunnel kilns were tried elsewhere on the site but Building G was wed to bottle kilns. Although tunnel kilns were introduced as part of the war effort, Royal Worcester waited until later renovations gave them the opportunity to chance their arm with gas but still the old bottle kilns were kept in reserve. Once proved to be successful, tunnel kilns were embraced with all the zeal of a convert and by the 1950s bottle kilns were coming down thick and fast and new tunnel kilns being built in areas where there had been no buildings before.

The building of the new kilns and placing house/green room meant that the Parian Room in Building G and two enamelling kilns (22) were demolished and moved elsewhere. 'Parian ware' was a type of white porcelain which resembled pure-white statuary marble (also known as 'statuary porcelain'). It was used for busts and figurines. It was first produced by Copeland c1846 but Worcester excelled in its manufacture. It was introduced during the regime of Kerr and Binn during 1852 – 1862. Annealing kilns were smaller than the normal kiln and reserved for the firing of expensive painted porcelain. These kilns are better known as 'muffle furnaces' – the operation was so delicate that it was sometimes necessary to pass the piece through the furnace up to four times to get the oxides to take in all parts (see Figure 45 as an example).

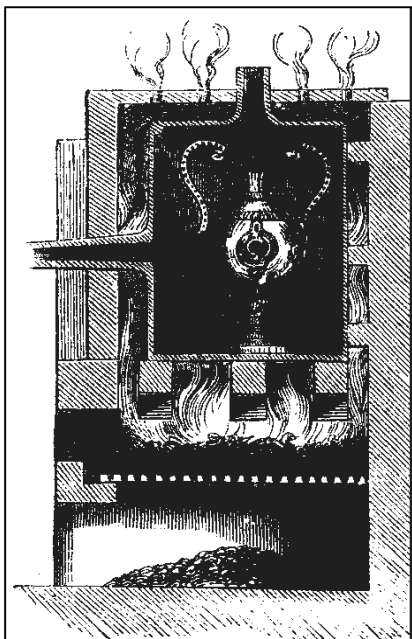


Figure 45: A muffle furnace at the time of the Great Exhibition of 1851 (Tomlinson c1851)

### **Buried archaeology**

Discounting the tunnel kiln and gas kilns, the site of Building G was occupied by kilns of three phases – pre-1863, c1867 and finally the 1930s. With the kilns of the last two phases there is a particular caveat as they lay roughly on the same sites and, if found, could be mistaken for either of two phases. All that can be said is that those for the 1930s would be larger.

When kilns were replaced it is possible that the site was first cleared – thus the older kilns might not be deeper than their replacements. In attempting to identify which phase any remains might belong to it is imperative that an accurate assessment of possible location is first made. With all phases the concentric bases of hovels and ovens can be expected. Those from the 1860s might be more easily determined as they lay more towards the middle of Building G.

However, the most important remains are those associated with Parian Ware (the only reference to it on the site in 1863 and probably where it was first made at Worcester) and enamelling – two products for which Worcester is internationally famous. Both the Parian Room and muffle furnaces lay towards the middle of the west boundary of the development area occupied by the present Building G. Here there could possibly be remnants of the west walls of the 1867 placing house which, when laid, may have destroyed evidence for both. Nevertheless, it is suggested that the utmost care should be exercised in these areas as development takes place.

### **Ancillaries and additions**

There was a bridge which joined Building H to G (Figures 46 and 47). This was replaced by one joining Buildings F to G (Figure 48) but after June 1966 this itself was replaced by one joining Building F to E when a lift was installed in Building F to bring goods to first floor level (Figure 48) It joined Building E by breaking through the southernmost window of its east elevation.<sup>23</sup>



**Figure 46: The original access to the bridge between Buildings H and G shown in the centre of the photograph**

23 Worcester City Planning Application 17032/4 3.6.1966

A further bridge joined Buildings G and J and was completed after March 1991<sup>24</sup> added on to the east elevation of Building G has been mentioned in connection with a tunnel kiln. An accretion to Building E was the uglier tin cover (Figure 49).



**Figure 47: The original bridge between Buildings G (left) and H (right), looking north (source: Worcester Porcelain Museum)**



**Figure 48: Bridge from Building F (on the right) to Building E, from the south**



**Figure 49: Shed in front of Building E from the north-east. The new bridge is between Buildings F and E**

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Curator, Worcester Porcelain Museum

John van Laun PhD FSA MIFA

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