

Brickbats Supplement March 2020

A Visit to the London Brick Company, Kings Dyke Works

In my quest to learn as much as possible about brick manufacture, I relish every opportunity to visit existing brick yards and one such opportunity arose in July 2019. Kings Dyke Works, Whittlesea, near Peterborough, makes traditional *London Bricks* and a visit to the works had been organised by Mike Chapman of the British Brick Society.

Everyone must be familiar with the *London Brick Company*. It does not have a long history, beginning later than Hooper and Ashby, but after a series of owners, mergers and take overs, by 1973 it was producing 2.88 billion bricks annually, 43% of the total home market. The success of the enterprise lay mainly in the clay. The deep seam of *Lower Oxford Clay* is rich in carbonaceous material which means that at high temperatures it will combust of its own accord. This means lower fuel costs and an obvious edge over its competitors. The deep V shaped frog was found to improve the burning process by allowing greater heat penetration to the centre of the brick. These familiar looking bricks were known as *Flettons*, after the name of the village near Peterborough where manufacturing began.

Summer 2019 was hot and our visit to the works coincided with one of the hottest days. On arrival, the first thing that struck me was the height of the chimneys. There are three, and the tallest is 121 metres tall (397 feet). We were introduced to our guide who gave us a background talk about the site.



The *London Brick Company* had built the works in the 1960s and the present owners, US company *Lone Star*, purchased the business in 2015, renaming the company *Forterra* but keeping the *London Brick* trademark for bricks made at the Kings Dyke Works. They produce 29 different finishes and aim to supply a close match to existing house bricks, for the domestic renovation and extension market.

The clay is obtained from a quarry about half a mile from the site. It is extracted by a Dragline Navy which removes a thin layer as it travels from bottom to top, thus ensuring a good mix of strata. It is then transferred by conveyor belt to a primary crusher and then to a large building for storage. The clay is only dug during the day shift, so it is necessary to have clay in hand to feed the works, as manufacture takes place 24 hours a day, 7 days a week. We did not see the quarry or storage facility as that was a little way from the brickyard. The clay arrives on site by conveyor, 3.5km of belts in total. The conveyor belts are all covered to prevent the clay getting too wet in rain or drying out too much in the sun and they can send up to 300 tonnes per hour to the site.

Our visit began in the clay preparation shed where 16 Craven and Fawcett "INCLA" dry grinding pans are fed from hoppers which are topped up automatically from a conveyor belt. Dry grinding mills have revolving pans and perforated gratings in the bottom for the crushed material to drop through. We had been provided with ear defenders but the noise in this area made conversation impossible, even when shouting. One of the grinders was shut down for maintenance, possibly a section of perforated grating was being replaced.



The ground clay passes through screens of electrically heated piano wire where material larger than 2.8mm is rejected and sent back to the grinding mills. During very dry weather water sprays can be used to keep the clay moisture level to around 17%. In times of very wet weather, ground brickbats can be added to the incoming clay to aid in grinding. The material is then ready to be stored in the hoppers feeding the brick making machines. It is sampled and monitored several times a day for particle size and water content.

There are 22 brick presses, each one producing a pair of green bricks at the rate of 26 bricks per minute. The material is fed by gravity into the two back boxes where they are pressed, then ejected forward into the front boxes where they are pressed again. The pair of bricks are taken forward on a short conveyor which transfers them to a conveyor running at right angles in front of the row of brick presses. This was a mesmerising sight, seeing the bricks emerge at such a quick rate.

The green bricks are then tidied up, removing unwanted protrusions of clay debris, by passing through a series of scrapers and trimmers.



The next two stages we were unable to observe due to the exceptionally hot weather causing high levels of dust. For the green bricks which are to be patterned, their surfaces are softened by passing them beneath a series of water sprays after which they are textured by patterned rollers. A mixture of sand and pigment may be sprayed on at this stage to produce bricks of different colours.

The green bricks are dried in a four-chamber unit for 17 hours when the moisture content falls from 17% to 6%. Each chamber can dry a million bricks per week.

Our tour continued after the dried bricks had emerged from the drying chambers and were being stacked ready for burning. In a scene resembling, "War of the Worlds", untouched by human hands, robotic arms swung to and fro and stacked bricks ready for firing in the kiln. There is a total of 8 robots working in this shed. The brick stacks are collected by forklift trucks, but these are not ordinary forklifts. In place of the usual two, there are 8 arms driven forward into 8 spaces at the bottom of the stack. Expanding rubber pads on the sides of the arms grip the bottom row of bricks, which have been stacked header to the floor. Great skill is required to position the truck but, of course, these operatives are doing it all day.



We next visited the kiln control room where data is collected of temperatures and other factors affecting the drying/burning/cooling cycle which lasts about 10 days. Emissions from the three chimney stacks are also carefully monitored, as the works could be ordered to close by the authorities if it created excess pollution.



We walked back into the scorching sun and were shown the kilns. There are four operational Hoffman continuous kilns with a total of 115 chambers, each chamber holding 62,000 bricks. There are two chambers in each kiln being fired at the same time. The fire travels around the kiln continually all year long.

The stacks of bricks are moved directly into an empty kiln chamber by the forklift truck and we were able to see how the cunning robot had arranged the pile of bricks to fit neatly into the space beneath the arched roof.



When full the opening is bricked up and daubed with wet clay to seal it. We watched two men doing this and were told it takes them just two hours to complete the operation.

When sealed the temperature in the chamber begins to rise, heated by energy from the other chambers in the kiln. My understanding is that the *lower Oxford Clay* self-combusts due to the presence of combustible material. Gas is then used to hold the temperature at 960°C.

After firing, the chamber is gradually cooled until a hole can be made in the bricked-up entrance wall to speed up cooling.



It was surprising to see the last stage, before the finished bricks leave the works. After all the automation (at no point are bricks handled by hand during production), the last stage of sorting and packing is undertaken by humans using their hands. The orders are assembled and delivered by truck.

A railway line runs alongside the works but this is not used to transport the bricks. There are no signs of tracks or disused sidings so if rail ever was used, it must have been some time ago.



After the visit I was able to reflect on the differences between Kings Dyke Works and Bursledon Brickworks. The size difference is obvious, and the brick making/pressing method is quite different, *London Bricks* being made by the semi-dry process. The clay has much less moisture content than at Bursledon so is less plastic. The greatest difference is in automation. Bursledon was very labour intensive with much of the worker's time occupied by moving green bricks around the site. Improvements were made at Bursledon and John Bevis, who worked there during the early 70s, remembers "Hyster" forklift trucks being used at that time. These were smaller, however, carried fewer bricks and were unable to enter the kiln. Surprisingly, despite automation, the Kings Dyke Works employs about 250 people. But they do produce 145 million bricks annually which equates to 580,000 bricks per employee. Along with the rest of the works, that's quite impressive.

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