

A Report on His Engineering Training

by Peter Fiennes Wilson (c. 1952)

1939	Pupil Engineer with Messrs. Charles Brand & Son Ltd.
1939-1940	Undergraduate at Cambridge University
1940-1946	Military Service
1946-1950	Assistant Engineer with Messrs. Coode, Vaughan-Lee, Frank & Gwyther
1950-1952	Senior Assistant Engineer on the Apapa Wharf Extension, Nigeria

My engineering training can strictly be said to have started thirteen years ago, when in the year before the war while I was waiting to go up to Cambridge to take the Mechanical Sciences Tripos, I was employed by Charles Brand & Son Ltd. as a pupil under agreement on an Underground extension contract in East London. I was with them for over six months but can now remember very little of my work there except that in retrospect I find it peculiar that I have recollection whatever of having seen anything of the Resident Engineer's staff. My time was divided about equally between the site office, where I prepared simple drawings and checked quantities, and the site itself where I acted as an Assistant engineer's assistant in the setting out of the work. For the last three months that I was there one of the headings was worked in compressed air at about 15 lbs./sq. in., as an unexpected pocket of wet ballast was encountered in the blue clay.

This short period of training was followed by an academic year at Cambridge University and six years in the Army, most of the latter with the Royal Artillery.

In September 1946 I joined the staff of Messrs. Coode, Vaughan-Lee, Frank & Gwyther of Victoria Street, London, and was employed in their head office for the next three and a half years in the preparation of contract drawings and other contract documents, the checking of contractors' detail drawings, the plotting of surveys, the consolidation of information received from Resident Engineers, and other small jobs. During this period I sat successfully for sections A and B of the Institution examinations.

My first job in the drawing office was the preparation of drawings to show the reinforcements details in some R.C. roof and floor slabs for a power station at Kingston, just outside London. To start with my calculations and drawings were checked closely by a senior engineer, but as I became more used to the work this was relaxed somewhat. Presumably to give us training in these things, we had to trace our own drawings and were expected to produce a high standard of neatness. This work involved reading the relevant steel-work and plant drawings, and later I had to help in the preparation of similar steelwork drawings for the second half of this contract, and from time to time was given the job checking the calculations. When the steel contractors sent in their detailed beam and stanchion drawings these had to be checked and the contractors notified of any mistakes. This latter procedure also took place with the R. C. drawings and bending schedules. Quantities for these drawings also had to be taken out and I either did them myself or checked them.

I was occupied with this work for about a year, but throughout that time and later was always liable to be given other jobs to do concurrently. My employers were constantly required to submit reports on the suitability of sites for various engineering works and these had to be illustrated with sketches; progress drawings of jobs in the course of construction had to be kept up to date for Resident Engineers' weekly and monthly reports. The great interest of the work, apart from the technical aspect, was the number of jobs, nearly all of them abroad and in all parts of the world, in which I was involved, if only in a small way.

About this time I was able to accompany a senior engineer on a survey for a river wall near Liverpool and brush up my knowledge in the use and adjustment of the theodolite and level. I was also introduced to the box sextant and subsequently have found it a most useful instrument, both for setting out cross sections and for surveying larger areas where no great accuracy is required. There was a 32 feet tide at the Liverpool site and nearly all our work had to be done at low water and in a hurry. After returning to the office I plotted the survey and helped to put the various information which we had acquired, either ourselves or through the local authority, into the form of a report. The wall, which was to be about a mile long, had to be founded on clay for about half its length and it was decided that it would be necessary to obtain some undisturbed samples for testing at a soil mechanic's laboratory. Later we went up to get these and afterwards I was able to go along to the laboratory to watch them being tested.

The next job on which I was employed for any length of time was a screw pile jetty for a grain silo in Iraq. Calculations for the main beams and piles had been made some years previously, but the scheme had been postponed due to the war. Alterations in the plant to be used meant that these calculations had to be amended and all the details had to be worked up. After I had finished the four drawings and taken out the quantities and written the bill, a report came from the site that, contrary to previous information, the substrata was good for only half the load for which the jetty had been designed. This meant that the whole design had to be altered as the pile centres were already as close as 12 feet and the screws were 4'6" in diameter. To double the number of piles would neither have been feasible or economical. However by this time I had been moved to another department and someone else was left with this problem, which was solved by the use of caissons.

I had now been with Coodes for over two years and given my first outside job without supervision. This was to go and inspect a timber jetty at Tenby, in Wales, and report on what repairs were required. The jetty had not been used or maintained for a number of years and it had suffered accordingly. After I had made my inspection I was asked by the Town Clerk if I would come to a meeting of the Town Council and tell them what would have to be done to put the jetty into use again. In view of my somewhat junior status in the firm I was not quite sure if I should do this; however he was very insistent, and after telling them that the official report would follow later, I gave them a brief account together with an approximate estimate, which, fortunately, turned out to be fairly accurate.

My last year with Coodes was spent mainly on two jobs, a 140 feet gravity dam and the sea wall with which I had been previously connected. Both were of interest to me, the former because I had some part in the preparation of the specification and latter because it involved preparing six alternative designs together with estimates for each.

Before leaving Coodes office I had one more outside job, a survey for five oil jetties in South Iraq. I went out with a senior engineer who was to have talks with the local Port Authority and the Oil Company, while I did the actual survey work. This involved taking some eighty lines of soundings, some inshore levelling and ten borings down to 40 feet as well as a few current readings, and took me about a month.

On my return to London I had a short leave and almost at once was sent out to Lagos as Senior Assistant Engineer on the Resident Engineers' Staff for a Wharf Extension. Before leaving England I had a week's diving course at Messrs. Siebe Gorman's Factory and spent about six hours in their experimental tank, learning the first principles of a diver's work. This was most useful to me when underwater work eventually started in Lagos. The Resident Engineer himself was to follow in a couple of months' time and my job until then was chiefly administrative, trying to hurry up the Contractors in building our houses and site office, making contact with various Government officials and such like necessary preliminaries to a large Contract.

The Contract was for a half mile length of slice work wall giving a depth of 32 ft. alongside, and some 80 acres of reclamation on which normal port facilities, including four large transit sheds, would be built after consolidations. Initially my work consisted mostly of taking soundings and surveying the surrounding area, but as the Contractors assembled their plant other problems arose. Cement and sand test had to be made, monthly reclamation quantities agreed, stacking plans for the large concrete blocks thought as many of the Contractors' problems as possible, so as not to be caught napping when they submitted their various schemes for our approval.

An interesting incident occurred six months after the Contract had been let. The original Contractors found that their financial resources were not sufficient and were allowed to fall out, giving way to another firm who had been among the original tenderers. They had, however, to carry out the work at the prices quoted by the first Contractors. The changeover caused about two months' delay in the programme and it was not till just before I had completed my first eighteen months of duty that the first blocks were laid under water.

The setting out of the work presented some practical difficulties. Lagos harbour is of the estuary type with two main streams flowing into it. These two converge on the point where the new wharf is to be built, giving rise to currents of a strong and varying nature. Only for about an hour every day is the water reasonably still, and naturally at this time everyone connected with the marine side of the work wanted to do his job. If extreme accuracy had been required it would have been possible to slow down the work so that everyone could use this slack period, and it is quite possible then that blocks could have been laid to an accuracy of a quarter to half an inch. Similarly if the setting out for the blocks took place just outside the slack period the blocks could be laid up to an inch out of true and so on. Thus, to a great extent it had to be a compromise between accuracy and speed. It is in matters of this sort that it is so interesting to see how the Resident Engineer and the Contractors' Agent come to a working agreement, and it is also in matters like this that the junior engineer, without personal experience to draw upon, can find little guidance in the many books and papers that have been written about engineering works. So far all this setting out has been done by means of a plumbob hanging from a shore based derrick, but later as the work proceeds it will be from a floating derrick, which will increase the difficulties.

Coodes were also involved in the design of a power station near Lagos, and shortly after my arrival I was instructed by them to make a survey of the proposed site and also carry out a load test. This latter involved the excavation of two deep pits in water bearing sand using somewhat primitive pumping apparatus. Two R.C. piers were then erected into which, after backfilling, the load was gradually applied. The result of the test was interesting, for when the loading was about three and a half tons/sq.ft. the ground partially collapsed, but then came up hard again, suggesting that there were weak pockets in firmer surroundings.