10. Downing Street.



PIERS FOR USE ON DEACHES

C.C.C. or deputy. They must flowt up and down with the tide. The enchor problem must be mastered. Let me have the best solution worked out. Don't argue the matter. The difficulties will argue for themselves.

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Geoff Reiss takes a look at a major exercise

A project, like a mayfly, has a brief, fluttering life. When we think of great projects we think of great bridges and dams — what comes to mind are the outputs of these projects, not the projects themselves.

Soon after most projects have been completed, the ingenuity of the project team, their adept planning and speedy execution of the work are quickly forgotten. However, Ernest Bevan summed up the success of the Mulberry Harbours as a saving of 150,000 lives. The work of the team lives on.

Let's travel back in time to 1944. German forces occupied most of Europe right up to

the English Channel. The Nazi war machine held the French ports firmly. Meanwhile, America and England were secretly planning to invade France to start pushing the enemy back.

The

To fight a war in hostile territory over the channel meant not only landing forces, but also supplying them with tanks, lorries, food, munitions, fuel and all the other paraphernalia of war, while the enemy tried making life exceedingly tough. D-day did not suddenly come into being. Behind it were many months of the most elaborate planning, planning from innumerable angles, planning that could not allow for failure.

Mulberry Harbours A Great Project from the Past

But where to land the D-Day forces? The existing harbours offered the most desirable landing spots from a technical point of view but, for precisely that reason, they were the best defended places. The concentration of German forces around Calais, Le Havre, etc., provided the allied forces with an opportunity. The relatively lightly defended beaches provided an attractive spot where the Allies decided to throw a bring-yourown-harbour party.

The British chose the beaches of Normandy. There were no reliable charts, so intrepid naval officers were sent over to take soundings and gather essential information right under the enemy's defences. This makes a modern site survey seem tame.

There was also an engineering problem. A temporary harbour would have to be a floating harbour and a floating harbour would have to rise and fall with the 20' tide of the English Channel. How could you build a long, floating jetty big enough to carry lorries yet strong enough for tanks? It was time for the end of pier show.

History Explains

Churchill wrote to the CCO — 'Chief of Combined Operations', Admiral Mountbatten — on 30 May 1942 saying of these piers making up the harbours: 'They must float up and down with the tide.' The anchor problem must be mastered. Let me have the best solution worked out. Don't argue the matter. The difficulties will argue for themselves.' In today's management speak Churchill was saying, 'don't give me problems, just do it'.

The plan was to build prefabricated floating harbours in the UK, tow them over to France and set them in place immediately before the landing of the main invasion force. Each harbour was scheduled for three month's use.

But first the top brass of the US and UK forces had to be convinced that it would all work. There is a tale of said top brass all gathered in a bathroom aboard the Queen Mary. Physicist Prof. J. D. Bernal used 20 ships made of newspaper, a lifebelt and a bathbrush to demonstrate how the whole thing would work. The First Sea Lord was reputedly standing on a lavatory seat at the time.

They must have been convinced. The harbours were built and set in place at Arromanches and St Laurent. Each of these harbours was bigger than Dover's permanent harbour, were built in seven months, assembled in days and changed the tide of the war.

The 'anchor problem' that Churchill spoke of was simply this: the sections



making up a floating pier or jetty had to support the great weight of heavy equipment and yet be anchored close enough to adjacent sections to provide a continuous roadway.

The solution came from a dredger built for the Bahamas. The piers were made from steel boxes each fitted with four legs (known as spuds) embedded in the sea bottom. The pier section slide up and down on these spuds and so stayed in the right position in relation to its neighbour.

The English Channel is not renown for its smoothness. You also needed a breakwater to create a safe, calm area of water through which to disembark your loads. In the calm sea within the harbour wall, An aerial view of a completed Mulberry Harbour off the Normandy coast these floating quays would make it possible for ships to load and unload cargoes.

The hollow, reinforced concrete, boxed breakwaters as well as 'block ships' were taken over and sunk into position. The service quays were formed by combining pierheads with a roadway made from intermediate pontoons. Each welded steel pierhead weighed in at 1,000 tons with a powerplant, machinery and airconditioned quarters for the personnel. Together, the 18 Scottish-made pierheads would have been nearly a mile long.

The War Office employed the designers of the innovative Bahamian dredger. They were Messrs Lobnitz & Co., Ltd., Renfrew shipbuilders. In late 1942 Findlay's were instructed to build the prototype on the Clyde.

This prototype took only four months before being launched on 26th January 1943. They took it to the Solway and tested it with some prototype floating

bridges. The baptism went well: 'Entirely satisfactory', said the report of the day. The exercise was filmed for the Chiefs of Staff and the decision was taken to build Mulberrys with the utmost possible speed, organised by the Ministry of Supply. In August 1943 P.W. Robson, Chairman & MD of Findlay's was summoned to the Ministry of Supply in London to discuss the building of a further 22 pierheads.

There was huge competition for ship building facilities. Every yard, every berth was building the ships Britain so desperately needed. The shipbuilding programme simply could not be interrupted. Also all available labour was committed either to fighting the war or building ships. There was also a considerable requirement for steel plate and welding; the project team calculated the requirement for planing machines and came up with a demand greater than the total capacity of the country.

The prototype exercise had indicated a



minimum duration of four months for building. Allowing eight to ten weeks for preparing and equipping the yards, it was decided that construction would have to be done in four weeks to be ready for D-Day. The engineers redesigned the welding to make it easy — so less expert welders could work on the majority of the work.

George Maltby, Glasgow Director of Redpath, Brown & Co, Ltd, prepared a new set of working drawings. He persuaded steel firms on Scotland's North East coast to take part voluntarily in the shop preparation of the steel tonnage required for the hulls.

Ministry of Supply staff scoured the country for machinery and equipment, while Findlay's staff planned, coordinated and timed these activities. They found two fabrication sites. At Leith there was capacity to build 13 pierheads and 16 intermediate pontoons. Cairnyan scheduled four pierheads. Cairnyan was a military site and officers and men of the Royal Engineers went there to start work. These men were eventually to go out with the pierheads so they had a vested interested in making sure they worked.

A report of the project recalls: 'The competence and enthusiasm with which they set about building the first two pierheads was praiseworthy.' The men were replaced by a different crew for training purposes but eventually civilian labour came from the Leith yard to build and launch the fourth pierhead. 'Powerplant, cranes, launching ways, stores, workshops, offices, roads and railway sidings seem to grow like mushrooms.'

George M. Carter, Ltd, one of the most prominent steel erection firms was invited to come to the yard in force. R. Newsom, a director, took on the work and was seconded to Leith as Yard Manager. Lanarkshire Welding Co, Ltd, of

Task Name	Start	End	Duration	Resource Abbrev	Estimate to Cmpl	29	5	June 1 12	2045 19	26	3	Jul 10	y 2045 17	24	31	7	August 2 14	045 21	28	4	Septemt 11	ber 204 18	15 2
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French Harbours Captured		2.10.45																					
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French harbours Captured		2.10.45																					





Wilshaw came in with welders under their own principal Roderick MacDonald and his staff. In a few short weeks they found 200 welders. Then came plumbers, electricians, joinery firms and so on. Eventually 600 men and staff were assembled. The post project

report quotes: 'What a

site that Leith yard was when it had reached full tempo — railway sidings filled with supply wagons, scores of motor lorries moving in and out unendingly; the line of big cranes lifting huge prefabricated parts onto position; the flashes of welding tools; finally, the swift and picturesque broadside launchings — all of these against the lovely background of the Fife hills and the blue waters of the Forth.'

This vast organisation had not existed in August 1943, but by 26 January 1944 the first pierhead was launched at Leith and by mid-February the first was launched from Cairnryan. On 30 April the ninth pierhead was inspected, passed and handed over at Leith. Two more came from Cairnryan, five from Conway, North Wales. All of these components were towed South and, on 6 June, towed across the channel.

As with all projects there were doubters — those who thought the whole project was doomed and didn't want to be associated with a failure. At a meeting on 14 September the minutes record that 'Sir Leopold Saville stated the undertaking could not be carried out in time and wished to disassociate himself with the project and withdraw from the committee.'

Each breakwater caisson — called a 'Phoenix' — comprised a huge concrete box which could be sunk by opening sea cocks. Henry Boot Construction, McAlpine and Bovis had a hand in the building of these huge concrete boxes. Freddie Downing was one of the Bovis team on site and he later became my MD at Bovis Construction. He remembered pouring concrete on the upper parts while the caissons were already floating. One caisson tilted and sank because the concrete gang on one side were working faster than that on the other!

Project Team

We can identify two candidates for the post project manager; Rear Admiral Hickling, CBE, DSO, who 'took an active part in the planning of the great enterprise' and Sir Bruce White who conceived and led a great part of the enterprise. Prime Minister Winston Churchill was obviously the client for this great project. He was very demanding. In a memo he 'urged every possible endeavour to meet the target dates'. This was strong stuff in 1944, merely to get a memo from the Great Man was an event. Like all good project people he didn't

Above shows Blockships and Caissons forming breakwater

forget to praise. He later telegraphed to the project team: 'This is a fine feat. All departments concerned are to be congratulated.' The harbours went in and the Germans were caught napping. The D-Day landing cost many lives but turned the tide of the war. The Mulberry Harbours had made possible the beginning of the end. The Mulberry Harbours cost, at today's costs, around £1,000 million and this was spent in eight months in secrecy and at a time when all resources were in short supply.

The actual history of the on-site works is shown on the attached bar chart.

Twelve days after the first caissons had been sunk the weather turned nasty. There were 15 foot high seas for the four days of 19 — 23 June. These were reportedly the worst June gales for 40 years. The floating breakwater withstood about 30 hours of this gale before serious damage occurred. 'This is impressive', according to the official report on the operation written in April 1994.

You can still see the remains today. Not far away from the French end of the Eurotunnel, a project that has made trips to France so easy, some Phoenix caissons poke their heads up at low tide. It is somehow fitting that the Mulberry Harbours should leave their own tombstone standing near to the delayed, overbudget; permanent link to France.

