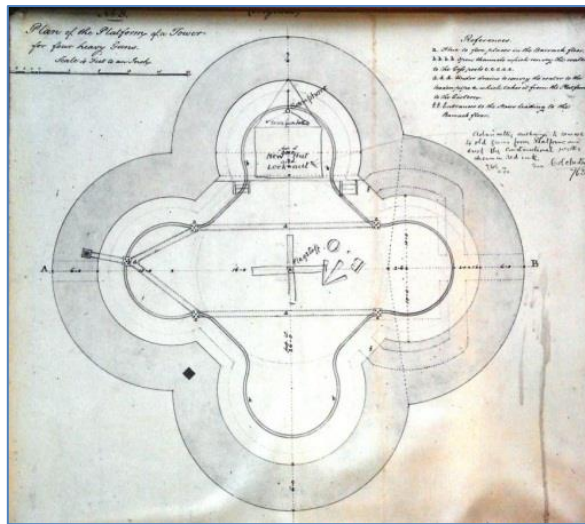


The Landmark Trust

MARTELLO TOWER History Album



Research updated 1998
Updated and re-presented in 2015

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BASIC DETAILS

Built: between 1808 and 1812

Acquired by the Landmark trust: 1971

Restoration and furnishing: 1973-74

Architect: John Warren, The Architectural and Planning Partnership

Builders: Reades of Aldeburgh Ltd.

Refurbishment: 2002

Builders: Cubitt Theobald of Long Melford

Canopy design & manufacture: David Tomlinson Structures Ltd of Bristol

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SUMMARY - THE MARTELLO TOWER, ALDEBURGH, SUFFOLK

The Martello Tower was built between 1808 and 1812. It is the most northerly of a chain of defensive towers built along the South and East coasts of England at that time, in response to the very real threat of invasion by the French, led by the Emperor Napoleon. When they were built, the towers were called heavy gun batteries. They soon came to be known by the name Martello, however, from the tower that provided the idea for their design. This stood on Mortella Point in Corsica. It was circular, of solid construction, about forty feet in diameter and the same in height. In 1796, with a garrison of 38 men and three not very large guns, it had withstood attack from two warships of the British Navy, one with 74 guns, and one with 32. The Board of Ordnance were so impressed by the tower's resistance to fire-power, that they adopted the design for their own towers. These too were round, or oval, and in their construction used up to a million bricks, most of which came from near London. The Aldeburgh Martello Tower is the exception, because instead of being round, it is quatrefoil in shape: in effect four towers fused into one. The reason for this is not recorded. It might have been a piece of lateral thinking resulting from the quatrefoil arrangement of a platform for four guns; or, as has been suggested by Sheila Sutcliffe in her book *Martello Towers* (1972), it might have been an earlier design proposed for the Dymchurch Wall in Kent in 1804 but never built.

The tower was designed for four guns, although in 1815 it was noted that there were only two 24-pounders there. These were fired over the parapet, off timber gun carriages shackled to ring mounts which still hang from their stone blocks. In the late nineteenth century, new guns were provided, with rifled barrels for more effective fire. The old guns, of which there were by then four, were sunk into the roof to act as pivots. The tower would have been garrisoned by the local Volunteer Artillery. On the main barrack room floor, there were double berths for eight soldiers, and single berths for five NCOs. The northern bay was partitioned off with a canvas screen, to provide a private room for the officer in charge. There were two fireplaces for cooking. The lower floor was used for storage - coal, water, food and ordnance. The powder magazine was reached by a separate stair, but lit by a window from the main store. It was placed on the landward side, for safety.

The tower did not originally stand on its own as it does today. It was once part of the village of Slaughden, of which the last houses survived into this century, but finally vanished due to erosion before the last War. The sea has also swept away part of the moat surrounding the tower itself, until stopped by the building of coastal defences of a different kind in the 1950s. In 1931 the tower, by then abandoned and derelict, was sold by the Ministry of Defence to a Mr Walter Wenham. Over the next few years it was occasionally used by the Mitford family for camping holidays. Then in 1936, it was sold to Miss Debenham, who commissioned the architect Justin Vulliamy to convert it into a studio. This was done very carefully by adding to its top an elegant penthouse, hardly affecting the interior or original structure of the tower at all.

By 1971, the Thirties penthouse had in turn become derelict, and the tower itself was badly in decay. This time it was acquired by the Landmark Trust. Extensive repairs were carried out, and the tower itself converted to provide holiday accommodation.

THE RESTORATION OF THE TOWER

When the Landmark Trust acquired the Martello Tower in 1971, it was in a very dangerous state. Vandals and the elements had between them done their best to destroy it. A whole section of the moat had been washed away, allowing the sea to reach the base of the tower. Large coping stones had been dislodged from the parapet, allowing water to penetrate the wall, and loosen the outer brick skin which had fallen off in a large area. The main floor inside the building had been ripped out, and the concrete penthouse was cracked and derelict.

The most urgent task was to put the tower back in a stable condition, and compared with this the decision whether or not to reinstate the superstructure seemed less important. In the end we decided that, clever and amusing though it was, the tower was better off without it. One additional benefit we were given by the tower's original designers. Orthodox Martello towers have a brick pier in their centre, to give greater stability. The Aldeburgh tower dispensed with this, allowing a central vaulted chamber, which we provided with a top light in a ventilation shaft. Additional borrowed light comes from the windows and over the top of the partitions. The missing main floor was replaced with that from the basement, raised up by block and tackle onto a new system of supports.

The Martello tower is built of brick - more than a million were used in the original construction, and many thousands more in its repair. For extra strength the towers were built with "hot lime", a mixture of lime, sand and hot tallow. However for the renewal and securing of the brick skin an ordinary lime and cement mortar was used, mixed with a waterproof sealant. In general, too, the towers were given a protective coat of lime render. There is no evidence that the Aldeburgh tower ever had such a coat, and it has been suggested that it was therefore left unfinished.

On the roof, the missing coping stones were replaced in concrete mixed with a granite aggregate and have done their job very well. The barrels we see upended today would have been used as pintle supports for the gun carriages (one such pintle remains today). The runnels made by the pivoting gun carriages can be made out in the flagstones and careful inspection reveals two such circular tracks, perhaps reflecting a change in firepower. The recesses which served so successfully as fireplaces in the 1930s were used for storing powder and shot, and one still bears the pintle holes for a pair of crude shutters.

Layers of concrete and asphalt had been laid on top of the original York paving stones on the roof in the 1930s. These were all removed, and in the initial restoration in the 1970s, the stones were pointed with a special sealant intended to keep out water. This did not prove successful, however, and by 2001 water penetration had gradually worsened to the point where we decided that a comprehensive overhaul was needed to address the problem. The sealant was scraped out and the roof flags repointed with a breathable lime mortar. Drainage, ventilation and heating were improved inside the tower and the internal walls were stripped of their plastic paint and repainted with limewash, which allows water to evaporate.

We are hopeful that these measures allowing the building to breathe should solve the problem in the longer term. Meanwhile, we are left with a huge mass of saturated masonry that will take a long time to dry out and it seems that some drips will continue at least for a while. So the current canopy was specially designed and made by Dave Tomlinson Structures Ltd from Bristol to catch the drips until the masonry dries out. The drips flow down the canvas dome into a skirt at its edge that channels the water away. The canopy has the added advantage of reflecting light back into the main space; it also has an agreeable maritime resonance of sails and campaign tents fitting for this fine remnant of the days when Napoleon stalked the Channel.

In 2015 Martello Tower was one of five Landmark sites chosen by artist Antony Gormley for an installation called LAND, a collaboration with Landmark in celebration of its 50th anniversary. From May 2015 until May 2016, five different, lifesize representations of a human figure in cast iron are placed at Landmark sites representing the four compass points (Saddell Bay, Martello Tower, Clavell Tower and on Lundy), anchored by a fifth near the centre of the country, at Lengthsman's Cottage in Warwickshire.

Mounted on the parapet above the gun terrace, the Aldeburgh figure, stares enigmatically out to sea.

Historical background

The name 'Martello' applied to the Tower at Aldeburgh is a double misnomer. The Tower was built and known originally as a heavy gun battery, and was the northernmost in a chain of defensive structures that had evolved from a tower on Mortella Point in Corsica. In 1796 the Mortella tower impressed the British Navy by repelling the combined assault of a 74- and a 32-gun warship, although manned by only 38 men with three guns of modest calibre. The tower on Mortella Point was circular, about 40 feet in diameter and of roughly the same height, having its entrance high in the landward face. Its design was the starting point in static defences against Napoleon.

The Board of Ordnance were so impressed by the tower's resistance to fire-power, that they adopted the design for their own towers. These too were round, or oval, and in their construction used up to a million bricks, most of which came from near London. The Aldeburgh Martello Tower is the exception, because instead of being round, it is quatrefoil in shape: in effect four towers fused into one. The reason for this is not recorded. It might have been a piece of lateral thinking resulting from the quatrefoil arrangement of a platform for four guns; or, as has been suggested by Sheila Sutcliffe in her book *Martello Towers* (1972), it might have been an earlier design proposed for the Dymchurch Wall in Kent in 1804 but never built.

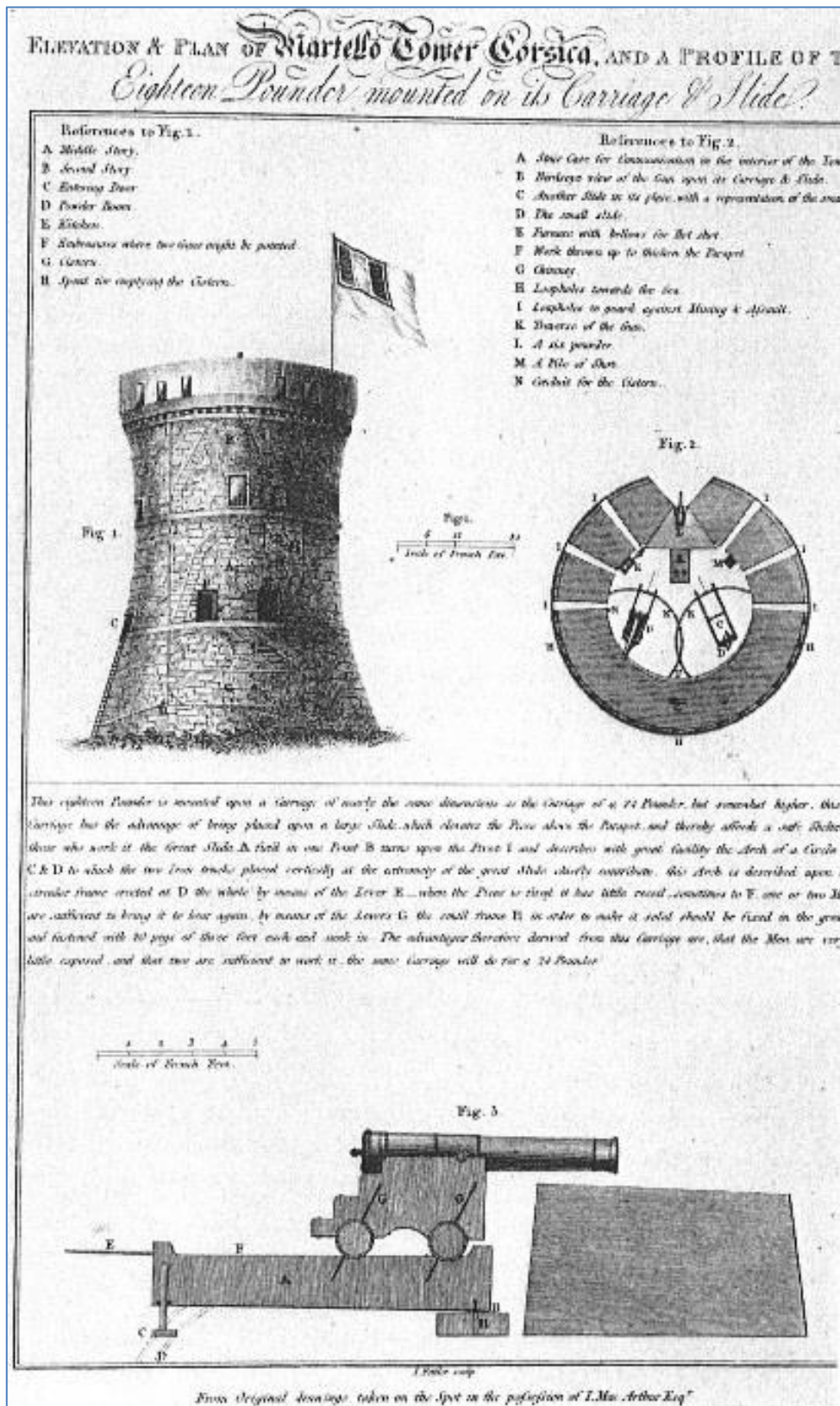
The chain of towers built along the east coast were designated with letters, ours being "CC" and those along the south coast were numbered.

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The powder magazine was reached by a separate stair, but lit by a window from the main store. It was placed on the landward side, for safety.



Tour de Mortella near St. Florent, Corsica



Elevation and plan of Mortella Tower, Corsica: an engraving based on the original drawings then in the possession of J MacArthur, Secretary to Lord Hood (from *Martello Towers*, Sheila Sutcliffe, David and Charles 1972)

A transposition of vowels turned "Mortella" into "Martello"; this has been explained as deriving from the hammer (*martello*) used in Italy to strike a bell to sound a warning – and perhaps more simply as a matter of English perversity in believing that all Italian words end with the letter "o". "Martello tower" became the generic name under which such defences were known, and under the threat of invasion from France 103 towers were built on the English coast, about 40 of which remain. A series of trials included the first scientific ballistic tests on masonry, in which cannonballs were fired at specially built structures in order to find out the strongest possible material for bonding the bricks: only when these bounced off the test walls were they considered to have the necessary strength.

Following these trials, one standard type of tower was adopted for the coastal defences of which Britain suddenly found herself in desperate need. While Napoleon's barges were being built and massed in their thousands across the Channel, government contractors threw themselves into the profitable task of raising in reply these massive pillars of masonry, of which even the smallest contained nearly three-quarters of a million bricks. William Cobbett, writing in 1823, long after the emergency was over, lamented the expense:

Here has been the squandering! Here has been the pauper-making! ... To think that I should be destined to behold these monuments of Pitt! ... Here they are, piles of bricks in a circular form. ... Cannons were to be fired from the top of these things, in order to defend the country from the French Jacobins! I think I counted along here upwards of thirty of these ridiculous things, which I dare say cost five, perhaps ten, thousand pounds each ... I dare say they cost millions.

Massed at favourable landing places on the Sussex and Kent coasts, the towers were carried northwards as a loose defensive chain around the shore lines of Essex and Suffolk. On these more northerly shores they were widely spaced and sporadic. The chances of troop-laden barges evading the might of the Navy on a voyage so far north were small, but there was always the threat of more conventional vessels sailing from the Low Countries to land troops on the eastern seaboard. A series of three Martello towers protected the mouth of the Alde at Shingle Street, where they can still be seen, stark against a sea-bright sky; and



The Martello Tower, built in 1810-1812, the most northerly and one of the largest coastal defences against Napoleonic invasion. It has been used as a gun site, as a signal station and as a private residence. This Victorian print shows the Martello is surrounded by grass and standing well back from the Sea. The

finally, at the northern end of the chain, was built the only radical variation of the basic type, the clover-leaf coalescence of several towers into one. This heavy gun battery, too, became known as a martello – the Slaughden or Aldeburgh Martello.

The Tower was originally part of a village – it is indeed the only surviving building of the village of Slaughden, which lay south of Aldeburgh and, like much of the town itself, has been engulfed by the wild North Sea. The Martello has suffered losses too: it was built on the highest ground inland of the southern end of the village, within a complete circular moat, with a gun emplacement on the seaward side and an associated group of buildings to the east and a rifle range to the south. Since the end of the Second World War the sea has carried away the eastern section of the moat wall and all the other structures, and it was only the

building of massive concrete sea defences in the 1950s that has – so far – saved the Tower from the tides.

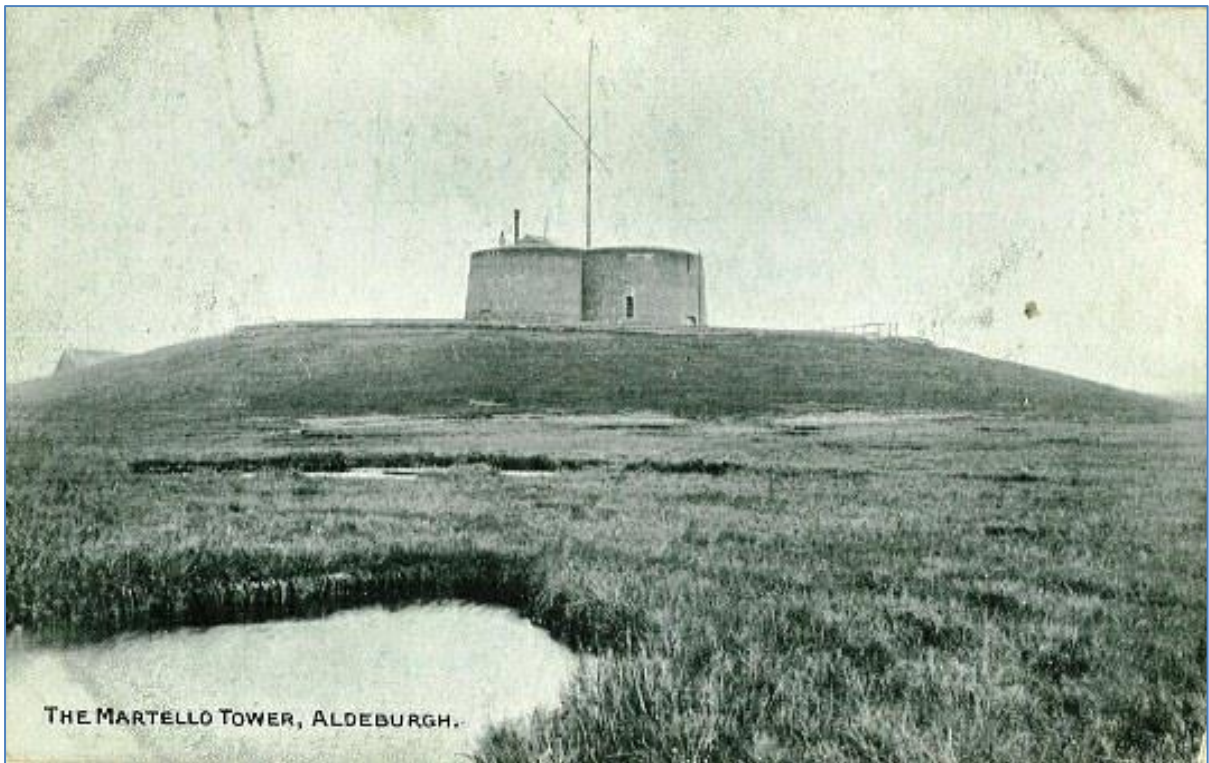
Work on the Tower's construction appears to have begun in 1808. Napoleon was regrouping the decimated armies of his Moscow campaign when the Tower assumed its final massive shape in 1812. It was probably garrisoned over these final threatening years that led up to Waterloo by the Aldeburgh detachment of the Artillery Volunteer Corps. The Force was disbanded after the Iron Duke's great victory in 1815. At this stage there was a platform to the east of the Tower on which heavy guns could be positioned; the Board of Ordnance lists indicate that there were only two guns at Aldeburgh, both 24-pounders.

In the absence of a garrison with a serious task, the history of the Tower in the reigns of George IV and Victoria is for the most part obscure. Towards the end of Victoria's reign, however, there was one identifiable event: modernisation of a sort.

The Tower was converted to a more modern armament of rifled guns, perhaps the incoming Hotchkiss or Nordenfelts. Four cannon, which had come at some unrecorded time to the Tower, were sunk into the roof to act as pivots, and the windows of the barrack room floor were trimmed back at the reveals to provide a greater arc of fire, with steps for sharpshooters (the outlines of the original arches can still be seen above the crown of the present openings). In the summer of 1902 a semaphore and lookout were raised on the southern quadrant, and so the Tower continued to back up the ever-mightier British Navy as it cruised the 'German Sea.'

Some years after the First World War ended, the Tower fell into disuse. Julian Tennyson, writing of his Aldeburgh boyhood in the late 1920s, said:

It used to be my delight on Sunday afternoons to sit in the dismal dungeons of the Martello Tower beyond Slaughden Quay and, when I heard a courting couple coming into the hall above me, to send them shrieking and scuttling with a few ghastly notes on my penny whistle.



An early postcard. The old village of Slaughden, now disappeared, can be seen on the left.

In 1931 the tower, by then abandoned and derelict, was sold by the Ministry of Defence to a Mr Walter Wenham. Over the next few years it was occasionally used by the Mitford family for camping holidays. In 1936 the Tower was sold again, its military career apparently over. The purchaser was a Miss Debenham, of the family associated with the flourishing department store Debenham and Freebody. For her, the architect Justin Vulliamy devised an imaginative and distinguished adaptation to form a luxurious beach house. Over each of the lobes he cast a concrete plate roof and above the centre he raised at a higher level a gentle saucer-dome, pierced by glass-lights and surrounded by full-height windows. A curved stair elegantly led up into this eyrie. Even in decay, it was still a structure full of the overtones of the cocktail party – a delightful exercise in intersecting circles, but commodious too. At this time the circular moat of the Tower was still complete, and from a distance the embankment gave it the appearance of standing on a grassy knoll. But the sea had already devoured the rest of Slaughden village and was moving dangerously close.

Miss Debenham seems to have used the Tower only a few times before the outbreak of the Second World War - this resulted in the Tower being requisitioned as an anti-aircraft post. It may, at this stage of its life, have fired its only shots in anger (indeed, perhaps the only action of any kind undertaken by any British Martello tower). It was equipped with light anti-aircraft weapons and is supposed, in local memory, to have "engaged enemy aircraft". After the war was over it was abandoned to relentless attacks from the sea and the weather, and suffered from both. The eastern face of the moat was breached before the disastrous floods struck the east coast in 1953, and the consequent building of concrete sea defences which now almost abuts the Tower itself.

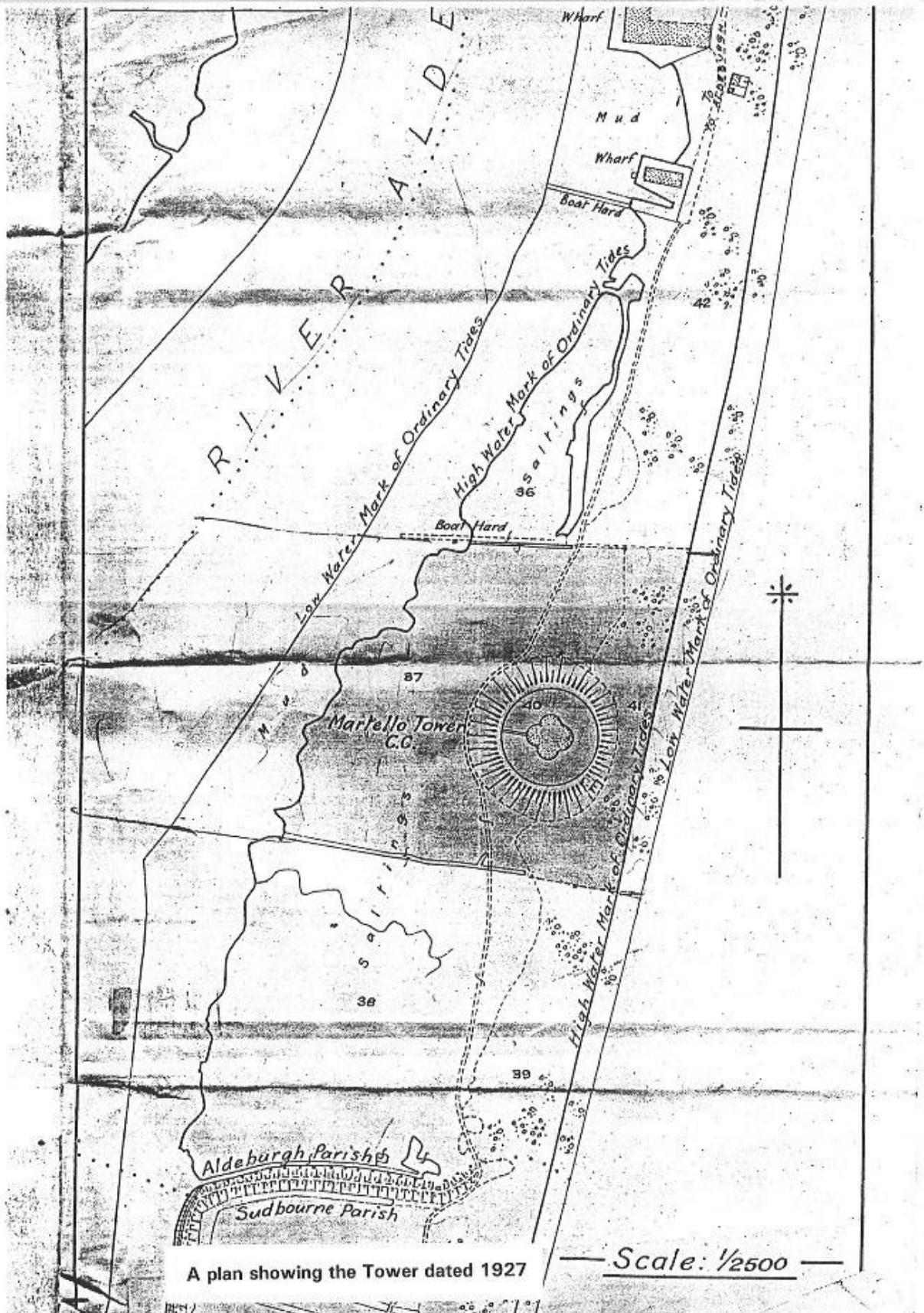
By the early 1970s Justin Vulliamy's concrete was spalling and its reinforcement corroding, while the saucer-dome vibrated with every gust. Its tubular supports having rusted away, it stood poised only on decayed Crittall window frames. Vandals had ripped out and removed the barrack room floor, and subjected the building to every conceivable insult and damage.



The Martello Tower, Aldeburgh with the flat on top built by Julian Vulliamy for Miss Debenham, derelict.



The architect Justin Vulliamy in 1936.



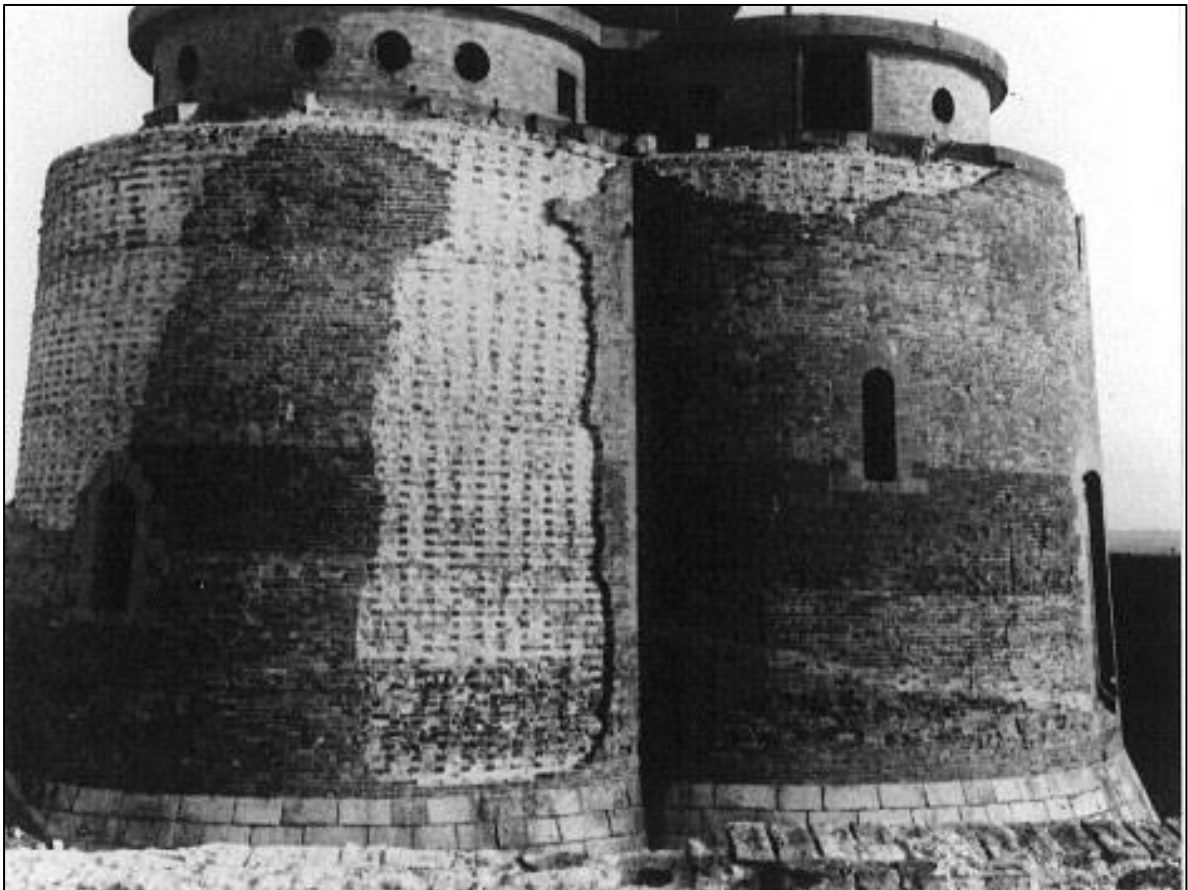


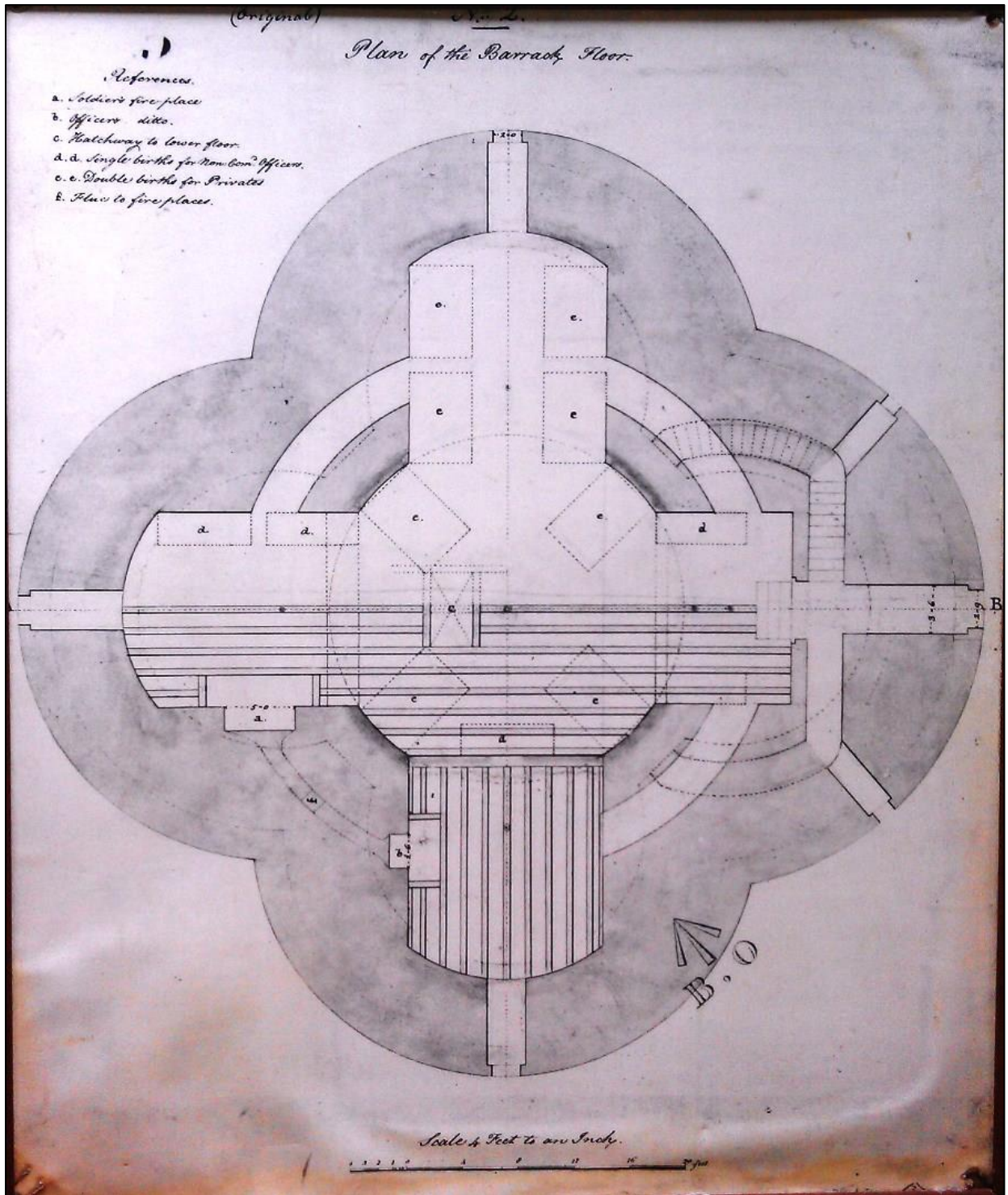
The Martello Tower in 1950 (RCHME)





By 1970 the Tower had lost large areas of the outer brick skin, and was generally in a bad state of disrepair.





19th century plan of the Barrack Floor

Construction

The original design might have been conceived for the four-gun tower that was to have terminated the Dymchurch range (but which was never built), or it may have been the natural development of the standard east coast type of tower with two staircases and a multi-lobed gun emplacement placed on a cam-shaped platform. Despite its uniqueness, its construction, which was supervised by the Royal Engineers, bears every mark of competence and practised skill. With every external wall curved and battered; its foundations built as inverted vaults; and its roof as dome and vaults, its setting out would tax builders of any age. Though there are faults (look, for instance, at the varying depths of the parapet copings), they are minimal. In its brickwork and its carefully cut stone dressings the building is as exemplary as it is rugged. Although a very good red brick was made with local clays, it was the Thames Valley yards that provided the yellow and purple stocks for the Martello towers. These were the bricks that had stood up so well in the military bombardment tests. They were reputedly laid in a hot lime mortar containing sand, lime-putty and hot tallow, which is a jointing material of outstanding hardness and strength. Portland cement had not then been invented. Fortunately, unlike other Martello towers, the Aldeburgh tower was never dulled over with a cement rendering. It has therefore been suggested that it was left unfinished.

As the work went forward, plans were varied in dimension and in detail, one specific modification being the drawbridge. The secondary balancing cantilever was omitted, permitting the level of the threshold to be reduced.

Unlike the basic Martello, the Aldeburgh tower had no central column of brickwork, presumably because no gun was positioned on the centre-line. The main chamber is simply domed and the central eye, not shown on the original plans, is thought to be the work of Vulliamy. The barrack room floor included eight double berths for private soldiers – common practice elsewhere but hardly necessary in this spacious building – and five single berths for non-commissioned officers. The northern arm was partitioned off. Remains of hooks for a canvas

brattice can still be seen in the arch. This room was used by the officer in charge. There were no lavatory facilities, but ample supplies of fresh water were contained in the cement-rendered cistern under the eastern arm. A trap gave access to the supply, and rain was fed into it through a lead-lined conduit from the roof.

The central section of the lower floor held all the general stores and ordnance. A stair led down from the eastern arm, with a trap door to give direct access. A pulley-eye still projects from the roof above, though the trap was originally in the floor below and gave access to the sump.

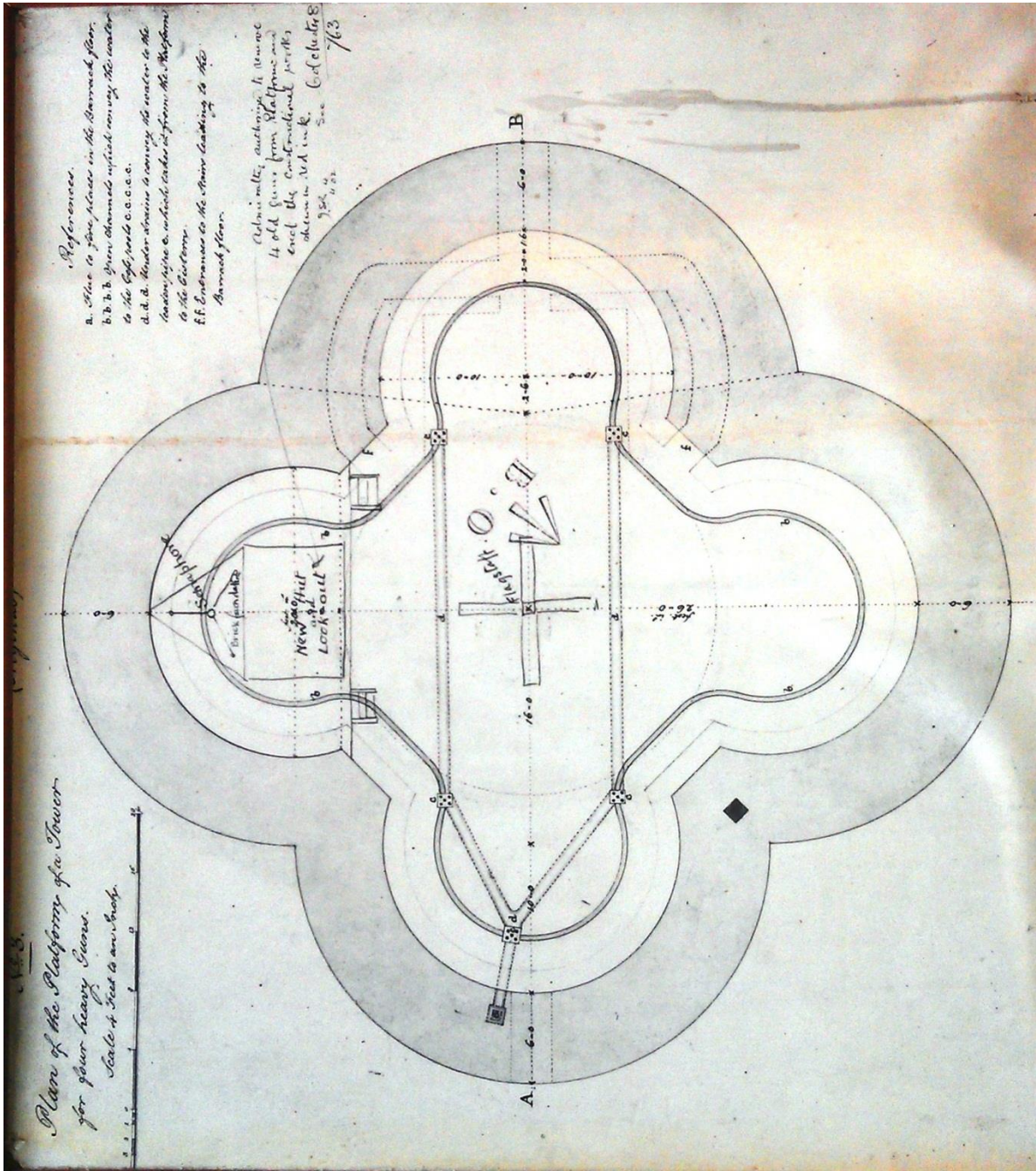
From the ordnance store a corridor opens to a window in the powder magazine. A lantern placed in this window lit the magazine safely, and access was then gained down a separate stair. The magazine was placed on the landward side of the building farthest from danger, and the cistern faced the sea. An ingenious system of ventilation ducts served this lower floor. As the ventilators could not be brought out in the face of the wall or on the gun deck, they were terminated in the soffits of the window arches of the barrack room floor and, for the magazine, in the entrance behind the drawbridge. It is not now clear how the windows were sealed. There were undoubtedly heavy wood shutters on the line of the present windows, and perhaps internal shutters also, in which case closing only the internal shutters would have been effective in producing a draught through the storeroom.

The guns fired over the parapet off timber gun-carriages shackled to ring mounts which still hang from their stone blocks. Powder and shot were manhandled on to the gundeck up the narrow stairways with their astonishingly vulnerable windows.

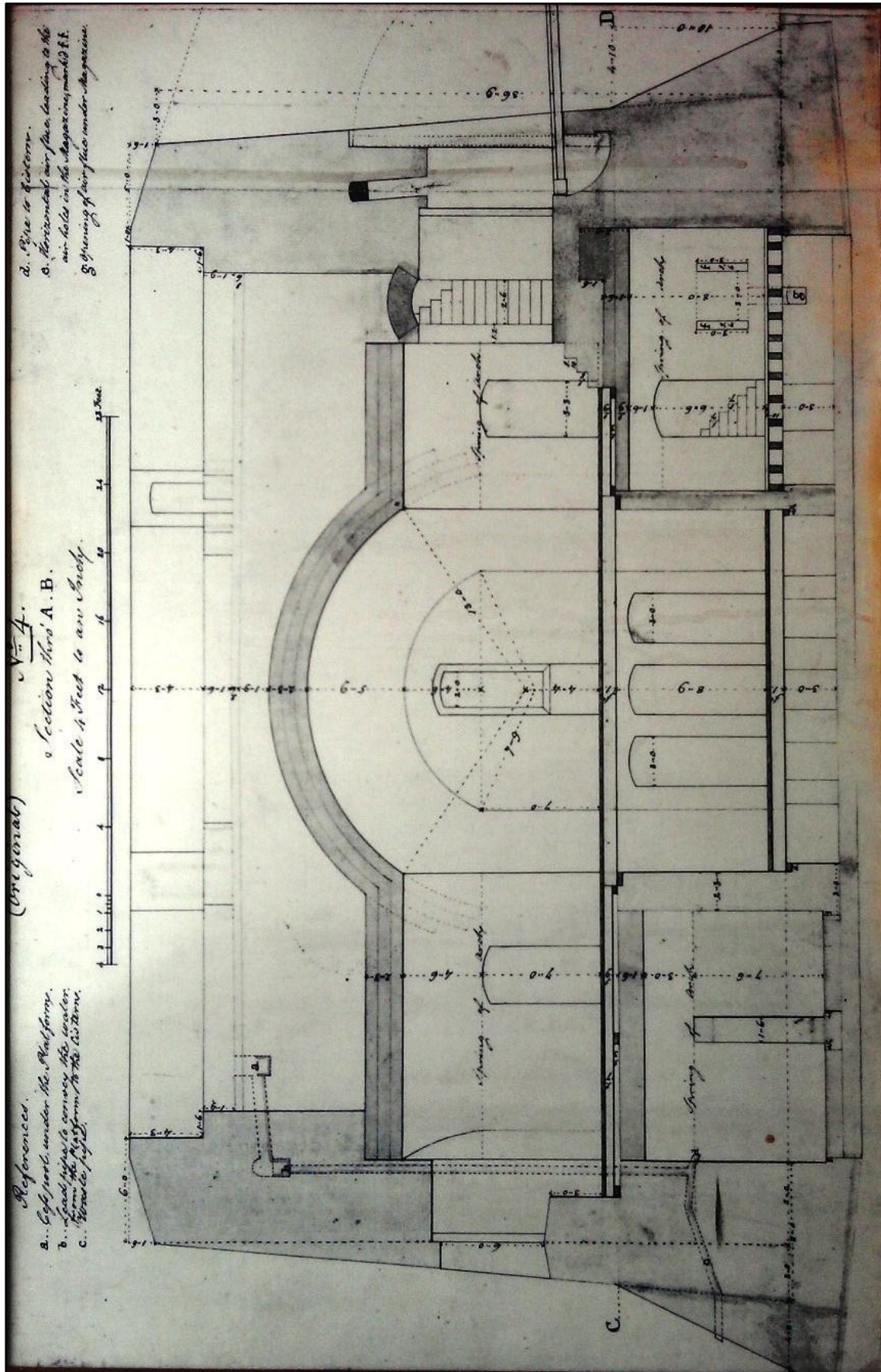
Not all Martello Towers were, like Aldeburgh, surrounded by a dry ditch or moat. This extra protection was provided against the risk of the enemy coming ashore and then storming the building from the land, and in general was constructed where a tower stood in a particularly exposed or vulnerable place.

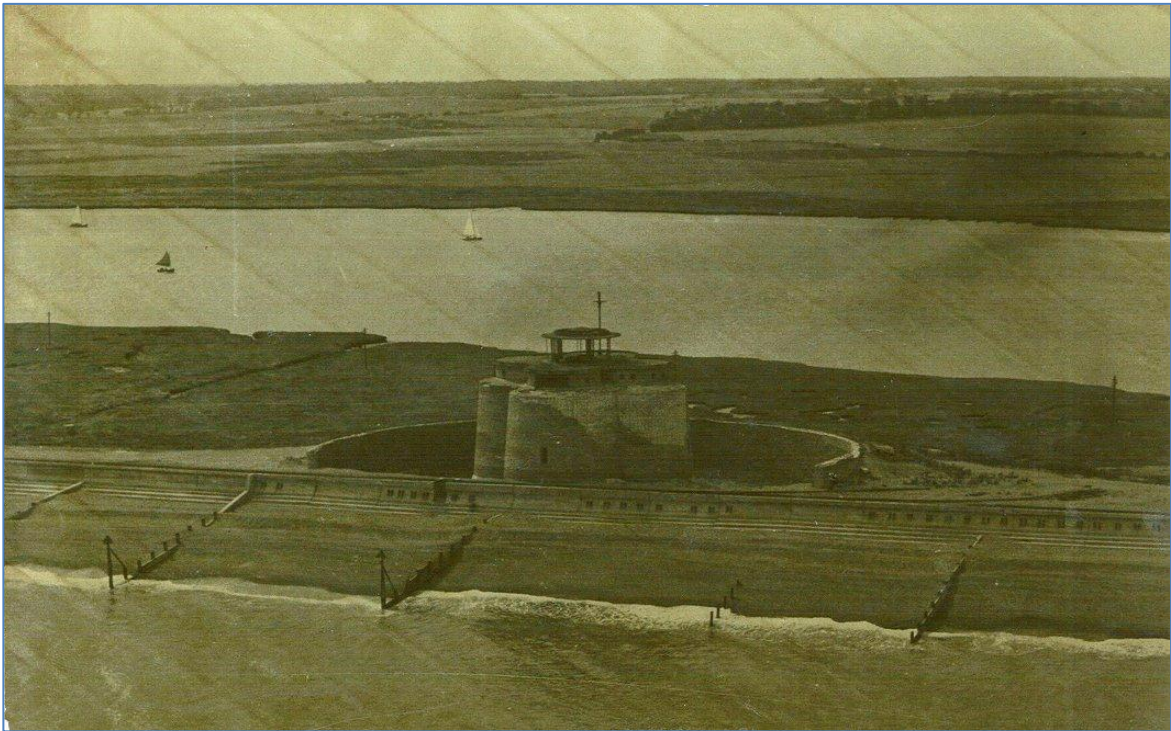


Looking down into the basement



19th century Plan of the Platform of a Tower





Before restoration

Restoration

The Landmark Trust purchased the property in 1971. In repairing the tower a clear decision determined the removal of the pre-war additions and the return of the tower to its original profile. To replace the central and southern sections of the vandal-destroyed barrack room floor, the storeroom floor was salvaged from beneath several tons of rubble and jacked up to the original level of the barrack room. It is a rugged and ship's-carpentered-looking piece of woodwork, the timbers having been adzed to suit the joists. This is a technique more reminiscent of shipwrighting than building construction, and the trick of using boards whose edges were out of parallel by cutting them down the centre and reversing to produce parallel outer edges is perhaps also indicative of naval rather than civil architecture. They have survived nearly 200 years of dampness astonishingly well. The timber which had been used in the tower was oak, with the exception of some of the longest spars which were of teak. The small surviving amount of this timber has been re-used in supporting the main floor. The timber used over the cistern to form the floor of the eastern lobe is maple salvaged from the pre-war construction. As there is now no floor at storeroom level a timber gantry has been constructed to provide internal access and give a view of the magnificent inverted arching of the foundations.

Surplus salvaged oak was used to make the tables and benches with which the Tower is equipped. On the roof the original York stone paving was exposed and the copings to the parapets repaired. Vandals had tumbled some of these great coping stones into the moat, where they still lie, and the loss of these copings led to parts of the external skin of brickwork coming away in a severe winter when easterly gales were followed by several days of severe frost. These areas have now been repaired and bonded back to the mass of the Tower.

The windows of the building are puzzling. The staircase windows appear to expose the occupants of the Tower unnecessarily to small firearms and the large windows originally had no splay to their reveals, a feature which must have limited their defensive use. Examination of the brickwork at the head of the windows and of the position of the steps of the southern window demonstrates the shape of the original opening. What seems to be ventilation shafting leads in two directions from a hole in the crown of the arch of the northern and southern windows down to the basement, emerging in recesses at diametrically opposed corners. These would have ventilated the basement efficiently only if the window-shutters had been on the inner face of the wall!

Original hammock hooks can be seen in position and around the arch of the northern room the remains of suspension brackets indicate the possibility of a screen or curtain that may have divided the officers' quarters from those of the men. Just inside the entrance door can be seen two handsome stone brackets, which were the inner terminals of the chain ducts for the counter-balance weights to the drawbridge. Many of the counter-balance weights were found in the basement and can still be seen there stacked in one of the recesses, together with their wrought-iron suspension rods.

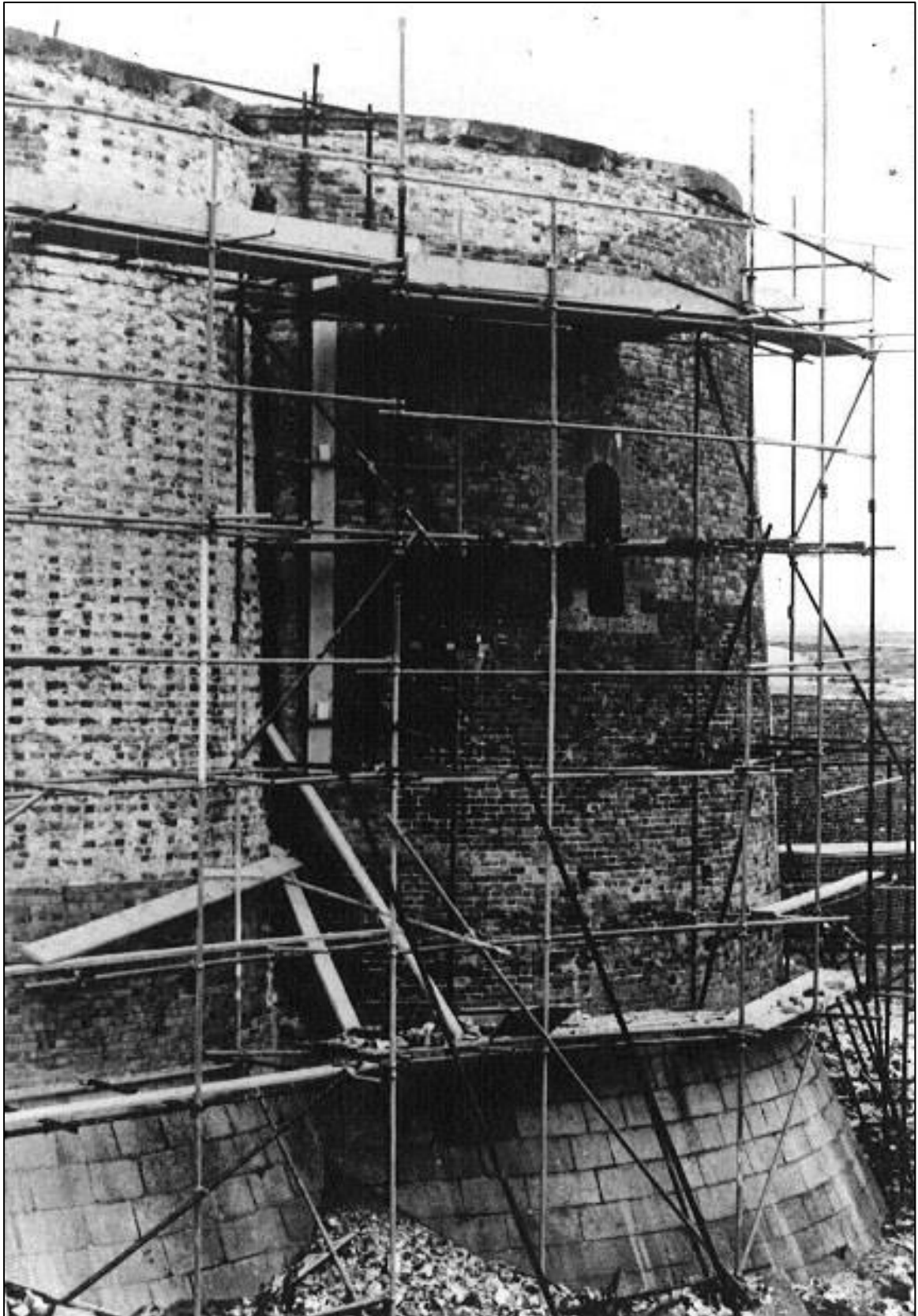
A wrought-iron eye fixed in the wall of the central chamber was a suspension for a block and tackle to lift stores to and from the lower chamber. The present trap is original but was, of course, at the lower level, giving access to the sump and the reverse-arched foundations which are now exposed to view.

The powder room was gained by a wooden stair, which was isolated entirely from the main basement (to avoid the risk of sparks from boots). No lamps were permitted in the powder room, and the only lighting was by a lantern placed behind a tiny glazed oriel reached from the still-accessible basement passage. The walkway in the basement is new.

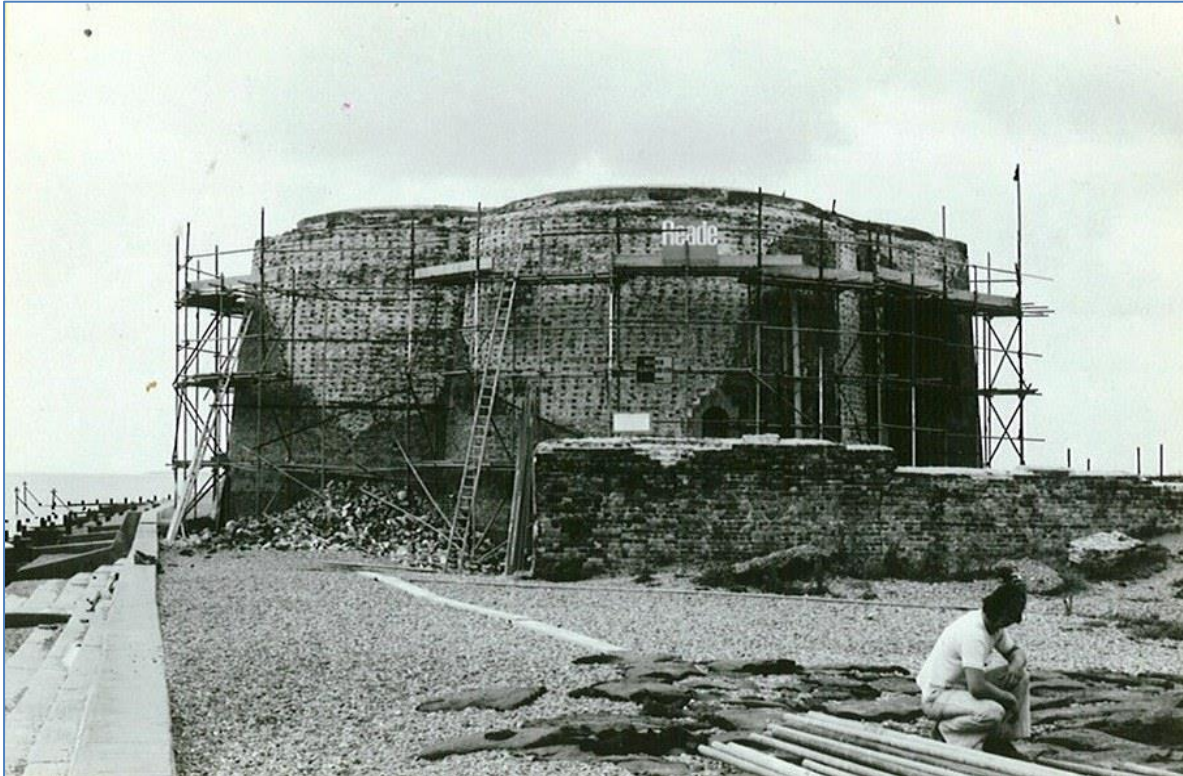
The original builders departed considerably from the designs (which are still held in the naval archives) and the problems of constructing a building of such a shape will be evident if the alignment of the brickwork is studied. The variation in the thickness of the outer face of the copings is an immediate pointer to the problem.

The repairs were carried out by Reades of Aldeburgh Ltd, with their customary thoroughness. This was also the firm that had been responsible for the pre-war alterations. The work was supervised by Mr William Muttitt and the foreman bricklayer was Mr Abbott, whose work can be seen in the external brickwork and in the arching inserted to carry the floor. In their joiners' shops the surviving external doors were carefully repaired, and one further copy was made to hang in the entrance to the living quarters.

With one exception, the restoration was faithful to the evidence. The variation was in the bridge across the moat. Originally a timber bridge sloped down from the moat's side to the drawbridge. In the renewal the moat wall has been cut away to level the bridge through and render less conspicuous the service pipes carried underneath it. The section of chain rail serves as a reminder of the original drawbridge, one chainway of which now serves as the bell-pull to the door of a building of such extraordinary profile that it must surely be one of the most handsome beach huts in the country.



Work in progress



Work in progress



Work in progress on the roof. The pivot in the centre of the picture is an earlier cannon set into the roof when swivel guns were introduced. Above is an original restraining ring for the recoil chains of the gun carriage. To the left is one of the fireplaces of the 1930s flat.



In high seas, August 1982

Update September 2002

Regular visitors to the Martello over the years cannot have failed to notice a long term problem: the drips from the ceiling in the main living space. For a long time we relied on Landmarkers' good humour and acceptance of the quirky – in this case, a progression of specially made terracotta pots to catch the drips. Various attempts were made to trace the source and to solve the problem, but without success. By early in 2001 the situation had passed beyond the quirky: our long-suffering visitors were coping with up to thirty seven vessels, and not all of them specially made terracotta. The drips were ever elusive; just when one pot was successfully positioned, the drip would move elsewhere – the entertainment value, we felt, was probably wearing off. The time had come for a major maintenance programme and the building was closed for much of 2001 while the situation was monitored.

Work began in spring 2002, with a sense that a return to basics was in order, both in terms of our approach to the fabric of the building and to its interior, where some of its military aspect had been unwittingly eroded over the years.

It was found that the water penetration had probably been exacerbated by some of the remedial measures tried in the past. For example, on the roof, modern mastic had been used in an attempt to seal the joints between the flagstones on the gun terrace. Unfortunately such sealant requires a bone-dry surface to bond correctly – impossible in this coastal setting. The water was therefore not just penetrating the joints but its evaporation was then being impeded. Similarly, clear sealant had been used on the flags and plastic paint on internal brick walls, again impeding evaporation. The water pressure which built up behind the paint soon caused it to bubble and burst. A fundamental principle in the care of old buildings is enabling them to reach an equilibrium with their environment, which is achieved above all by permeability, and it was this that we set out to reinstate.

First, the mastic was removed from the joints in the roof flags and replaced by lime mortar. Internal walls were stripped and repainted with permeable limewash. Careful management of the drainage goods should also help prevent penetration in the first place and improved heating and ventilation will play a large part in managing the water ingress in the future. Meanwhile, we were still confronted by a huge mass of saturated masonry that would take a long time to reach the desired equilibrium. It is not yet clear whether continuing leakage into the main space will be a short or medium term problem, but it was clear that the drips would continue at least for the short term. The step taken to address them was an imaginative one and takes the form of the current canvas canopy, which stretches the full extent of the main space.

The canopy was made by Dave Tomlinson Structures Ltd from Bristol, who design and make such structures primarily for exhibitions but also for more permanent uses. Landmark provided initial sketches and dimensions, which were then worked up using Computer Aided Design. There was a site visit to discuss the detailed design and shape and to agree the fixings, with a brief to involve minimal intervention into the existing fabric of the building. The canopy is designed so that any drips (and we hope and expect that there will be fewer and fewer) can flow down the canvas dome into a skirt at its edge that channels the water along a rope to four anchoring points at the top of the partitions where they feed into collecting trays. Small pipes hidden in the partitions then drain the water away through the underfloor void.

The canopy has the added advantage of reflecting light back into the main space; it also has an agreeable maritime resonance of sails and campaign tents.

Acoustics have also improved. As a material, canvas is not new to the building – not only did the soldiers sleep in canvas hammocks but there is a theory that the partition walls were originally simply canvas. The canopy is already proving its worth, and providing a happy combination of functionality and aesthetics.

We have also reopened the stairs to the magazine, blocked off in the past by a cupboard. A small new cupboard has been made to hold the boiler for new oil-

fired central heating, which will help the process of drying the structure out as well as keeping our visitors warm. The original timber floor level has been reinstated, making it easier to interpret this atmospheric corner of the building, as you pass down the timber stairs (not stone, as elsewhere, lest a hobnail strike a spark) and past the lantern recess, glazed once again against the risk of fire. As part of the central heating installation, radiators were re-sited to be more discreet. The sitting room has been made more cosy by the reinstatement of its partition and a new wood-burning stove. This room also used to suffer from curious passers-by; the previous curtains struck a strangely domestic note in this rugged building. To counteract both, the windows now have wooden shutters that can be wholly or partially closed against either the elements or the tourist.

The kitchen and bathroom have both benefited from a general refurbishment, the toilet now being entered through the bathroom. This enabled a bit more space to be gained for the shower room. New, more rugged ironmongery has been installed and the rather ugly water tank that used to be above the main entrance, partly obscuring the mechanism of the drawbridge, has been removed altogether.

The whole building has been re-presented in a more military style by the new paint regimen. The pale pine originally used and left bare had darkened and discoloured to the point where it was conflicting with the simple lines of the design. Stripped pine has always been a modern affectation and, while it was characteristic of the original 1970s restoration of the building, the woodwork is far more likely to have been painted originally. So a masculine, no-nonsense colour has been used, fit for the barracks this once was.

Re-visiting the building in such detail also gave us the opportunity to ponder the archaeological evidence anew. The light well in the roof, such a feature of Miss Debenham's conversion in the 1930s, seems likely to have been an original opening through which ammunition, passed through from the magazine to the main space, could then be winched up to the gun terrace. There is a hefty hook next to the light well in the dome, with a matching one below in the ground floor

space, both offset. Had there not been an opening originally, the hooks might have been expected to be centrally positioned.

Up on the gun terrace, it seems the gun barrels that remain are much earlier than would be expected for martello artillery, which would have required much larger bores. 24-pounders weighing some two and a half tonnes with a range of about 1.5 km were the main armament on the east coast towers. The heaviest guns would be sited in the seaward lobe for a symmetrical sweep of 103 degrees. The barrels we see upended today would have been used as pintle supports for the gun carriage (one such pintle remains today). The runnels made by the pivoting gun carriages can be made out in the flagstones and careful inspection reveals two such circular tracks, perhaps reflecting a change in firepower. The recesses which served so successfully as fireplaces in the 1930s (and as improvised barbecues today) were used for storing powder and shot, and one still bears the pintle holes for a pair of crude shutters.

Our intention is that this year's refurbishment should make it easier to capture the atmosphere of this fine martello, while also doing better for the building itself. The echo in the main space may be muted, but Landmarkers can still enjoy their rather communal stay, and overhear each other talking in their quarters.

Further update in 2014

In September 2014 we made a further alteration to the kitchen area. It was already a rather narrow room anyway, and with the problem of some occasions when water was getting into the electric backboxes set into the brick walls, it was decided to pull the kitchen forward, away from the wall, and thus remove the corridor partition to give the kitchen more space. A gutter has been fixed to the wall behind the new matchboarding to catch any drips, which are then drained away into the kitchen sink waste pipe. The previous shelving was removed and instead a new dresser was provided in the dining area, now equipped with Cornishware in place of Old Chelsea.



1975. The original restoration had used "knotty pine".

Martello Tower and the Culture Recovery Fund 2020-21



Landmarks that benefitted from the Cultural Recovery Fund 2020-21

2020-21 was the year when the COVID-19 pandemic hit the UK, and for nine months out of twelve, Landmark had to close all its buildings, with a resulting cessation of the holiday income that funds our buildings' maintenance. Vital projects across Britain were put on hold because of the pandemic, because of uncertainty about when contracts could be agreed or when specialist builders and craftspeople would be allowed to work onsite again. The closure of Landmarks for holiday bookings from March to October 2020 and again from December to April 2021 was a devastating blow to our finances and directly impacted Landmark's maintenance budget.

However, in autumn 2020 we were delighted to receive a grant of £1.2million from the government's Culture Recovery Fund, allowing us to reignite our planned maintenance programme and ensure that none of our buildings fell into disrepair.

Under the auspices of the Department for Digital, Culture, Media and Sport (DCMS), the Culture Recovery Fund was designed to secure the future of England's museums, galleries, theatres, independent cinemas, heritage sites and

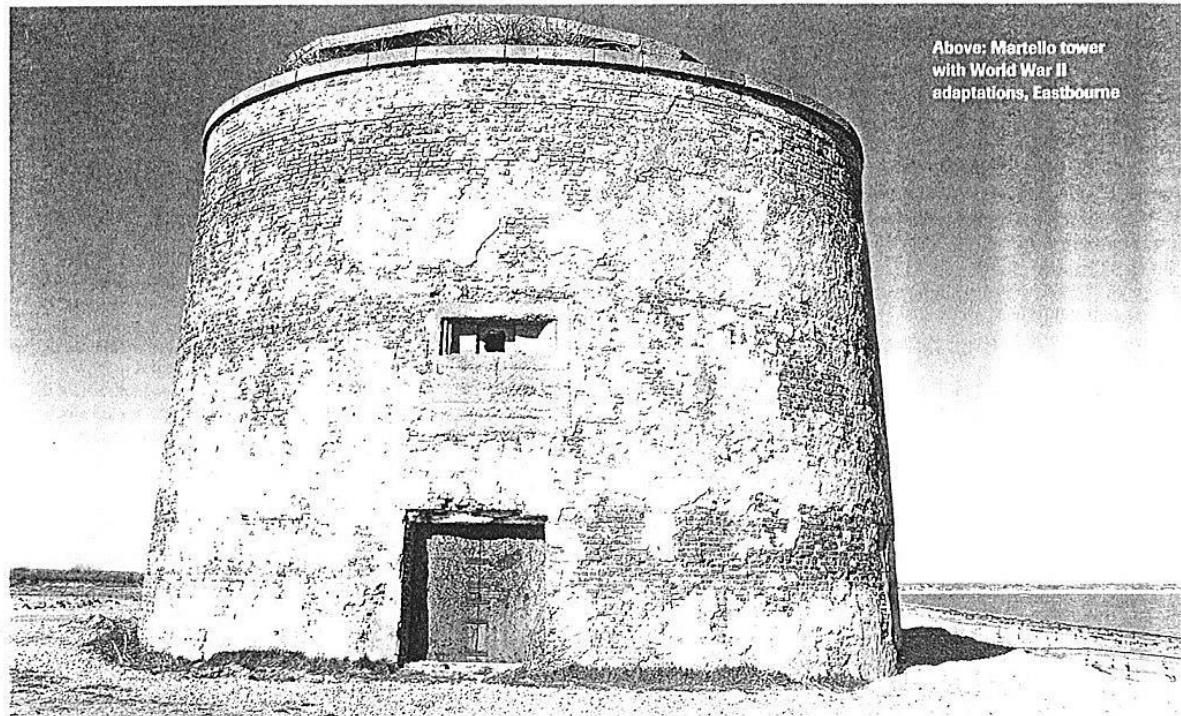
music venues with emergency grants and loans. One strand of the Fund was the Heritage Stimulus Fund administered by Historic England, which included the Major Works Programme, source of the grant to Landmark. This transformative grant allowed a group of 15 critical maintenance projects at 17 Landmarks across England to go ahead.

The projects directly provided employment and training for more than 130 craftspeople, including many multi-generation family-run businesses local to our buildings. Masons, carpenters, architects, engineers and many more skilled specialists were involved across these sites, fuelling the recovery of the heritage sector and contributing to local economies on a national scale. Several sites hosted students and apprentices, providing vital opportunities at a time of great uncertainty.

The upkeep of Martello Tower's massive walls, including the glacis, is a Sisyphean task. Thanks to the grant, award-winning firm, F.A Valiant & Son Ltd of Bury St Edmunds, family-run for three generations, undertook an urgent campaign of repointing to the glacis moat walls, and renewed about half its coping in lime. Conservation architect Philip Orchard of the Whitworth Co Partnership oversaw the project which, given the exposed beach location, required a particularly complex scaffold. This work will ensure the glacis remains sound and safe to welcome generations of Landmarkers ahead.



The glacis walls, scaffolded and sheeted against the elements for lime work in 2020-21.



Above: Martello tower with World War II adaptations, Eastbourne

Securing a future for Martello towers

Recognising the historic importance of the south coast's Martello towers, built to resist Napoleonic invasion, English Heritage has commissioned a review to provide the basis of a management strategy for their conservation

War with the France of Napoleon Bonaparte in the early 1800s left England's south coast vulnerable to invasion. In response, impressive systems of fixed defences were built to resist an attacker. This integrated system comprised major engineering projects, such as the Royal Military Canal, and a multitude of fortified camps, artillery batteries and redoubts. Another major component was a chain of 74 Martello towers built between Folkestone and Seaford.

A Martello tower is a gun tower built solidly in brick and sited either on the beach itself or on the higher ground behind it, positioned to bombard an invader. They are named after an earlier tower at Mortella Point, Corsica, at which fierce resistance to a British invasion so impressed the army that similar towers were used to defend our own shores.

The south coast Martello tower form is of two storeys, with a single door at first-floor level leading to living accommodation for troops. The ground floor was the magazine. The armament, a single 24-pounder cannon capable of traversing through 360 degrees, was mounted on the roof. Some towers had moats and drawbridges.

As with so many military schemes, that for the south coast was not completed until the invasion threat had largely receded and thankfully the towers

were never put to the test. They were soon considered redundant and a process of decline started. Some were sold off and demolished for the vast number of bricks they contained, others were bombarded to test the new high-powered artillery of the 19th century, and still more were lost to the sea. Some surviving towers found a new lease of life in 1939–45, when invasion once more became a threat, but today only 26 towers survive in any recognisable form. One of these has been reduced to a ruin by the sea and few of the remaining 25 have escaped dereliction or conversion to a new use.

Scheduling and conservation

The historic importance of the surviving towers is recognised. Most are Scheduled Ancient Monuments and a few are listed. The challenge now being faced is to manage the towers so as to secure their survival for the appreciation of future generations. English Heritage commissioned The Conservation Practice to undertake a review of the surviving 26 towers to provide a basis for a management strategy.

The Martello towers survive in varying states of completeness and repair. Some are derelict and others have been heavily altered to convert them into houses. The review has therefore sought to provide basic data

Photography: Peter Kendall

on all surviving examples, including completeness and physical condition. It includes outline schedules of work and indicative repair costs for the 12 towers most in need of repair and/or a new use. In addition, the report gives design advice on the issues to be faced in using the towers for domestic accommodation. In fact, the towers do not make good houses and conversion inevitably means some compromise to their historic form and fabric. We do not promote conversion to houses but the needs of those towers which have already been converted must be considered, and also any others which cannot be secured without re-use.

Collaboration with owners

Our intention is to develop a strategy for the future of the individual towers, working in collaboration with the owners and local authorities. This will involve combinations of retaining existing uses of some towers, including monuments and house conversions, and of seeking appropriate new uses for towers that are currently empty or derelict. Not all of the towers will be converted to new uses and some, by virtue of their isolated location, will be best repaired as shells and left as monuments in the countryside and a reminder of this episode in British history.

Towers 1–9

At the eastern end of the system, in Kent, Martello towers Nos 1–9 form an important group. This part of the chain is unbroken and includes some of the most intact examples. The towers stand alongside other major defensive structures of the Napoleonic period and thus illustrate how the coast was to have been defended. Tower No 5 is in good condition and has many original features, including its interior. No 4 is also relatively complete, despite its poor condition. With their owners, the local authority and others we plan to secure the future of these towers.

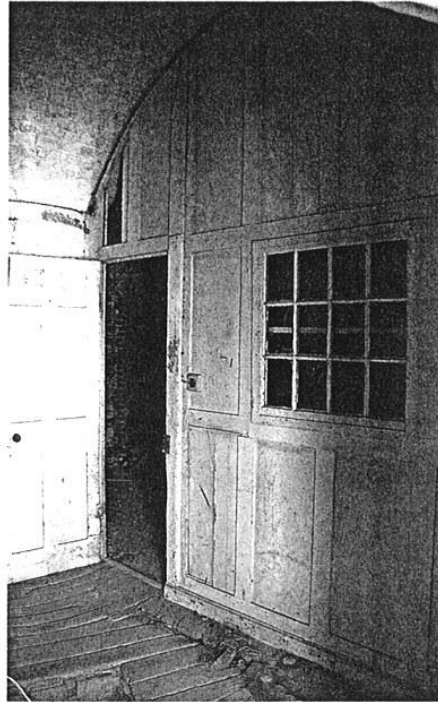
The Ministry of Defence is important to future plans for the Kent towers as it owns five of them. Two are within active rifle ranges and essential repairs need to be carried out. The other three are surplus to MoD requirements and are proposed for disposal. They are not suitable for residential conversion so more imaginative uses are required. A charitable trust has been formed to promote the preservation of Martello towers and this hopes to take on some of the examples that are currently without a use. For such plans to succeed there needs to be great cooperation between all the parties involved and the Heritage Lottery Fund which has been approached for funds.

East Sussex towers

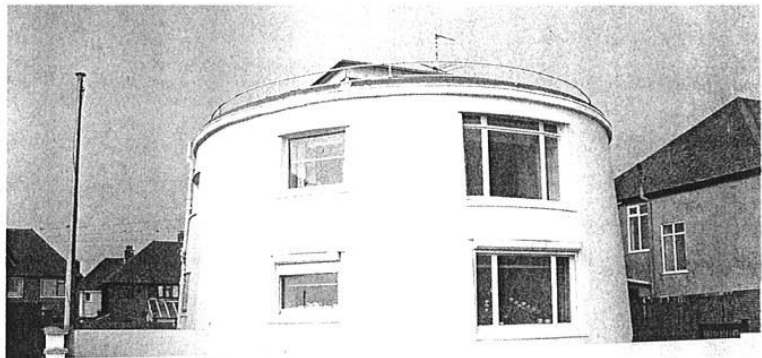
Most of the East Sussex towers have been lost, but those at Pevensey Bay are important as examples in their original beach setting. The future of these is likely to involve a residential element and the guidance on acceptable means of conversion will be important to assist the owners, the local authority and ourselves in taking forward such work.

At Seaford the local museum is housed in a tower and it is hoped to refurbish this. At Rye Harbour a currently derelict tower might be used as a visitor centre for the adjacent nature reserve. Both proposals are likely to involve applications to the Heritage Lottery Fund.

The south coast Martello tower study has provided a good understanding of this group of monuments.



Left: first floor interior of troops' living quarters, Folkestone. Below: a sensitive conversion of a Martello tower in Shorncliffe. Centre: an early, less successful conversion in Hythe. Bottom: on the beach in the MoD ranges at Hythe



Some Martello towers were sold off and demolished for the bricks they contained, others were bombed to test the new high-powered artillery

It provides a basis for a strategy for their conservation as a group, which will guide our response to proposals for any particular tower. Studies such as this lend themselves very well to closely defined groups of similar monuments in a limited geographic location. They have already been carried out for the Plymouth and Portsmouth defences, and English Heritage hopes to undertake reviews of other historic defence monuments, starting in 1997 with the historic fortifications to the dockyards at Chatham and Sheerness.

*CP Kendall
Conservation, East Sussex and Kent*



The East Coast Martello Towers

Jonathan Millward

[Colour plates relating to this article are in the plate section on pages 151 and 152, on the front and back covers, and on the inside back cover]

Introduction

The Martello towers along England's south and east coasts, built between 1805 and 1815, are evocative reminders of a time when this country was threatened with invasion by Napoleonic France. They were built in two phases, firstly along the south coast and secondly along the east. This paper discusses the east coast towers and associated defensive features, such as forward batteries and boundary ditches. Sites that have already been demolished are also assessed to determine what, if anything, still survives.

This present survey of the towers follows on from similar investigations undertaken by the Ministry of Works in 1937 and the Department of the Environment in 1975 and was undertaken to address a major regional concern, coastal erosion. It will assess the threats to the towers and the potential impact of coastal erosion on these important monuments.

Historical Significance

The Martello towers are a series of small coastal artillery forts built at the beginning of the 19th century to counter the threat of invasion posed by Napoleonic France. Ironically they were never used as the threat had passed by the time the towers had been built.

On the coasts of Essex and Suffolk there were originally 29 Martello towers built between 1810 and 1812. These towers stretched between St Osyth in Essex and Aldeburgh in Suffolk. They were designated by letters of the alphabet starting in the south with Tower A and ending in the north with Tower CC (the last three towers were referred to as AA, BB and CC). Most of these towers were associated with a forward battery, many of which had been built in the 1790s prior to the construction of the towers.

Of the 29 towers built along the east coast only 18 survive, if Tower R is included despite its having been partially demolished and incorporated into the Bartlet Hospital, Felixstowe, in the 1920s.

These towers are historically significant as they

represent a large scale attempt on the part of the British Government to create defences against the perceived threat of invasion, the most closely comparable period in this island's history is the stop lines and coastal defences built in the aftermath of Dunkirk during the Second World War. Although, large scale anti-invasion coastal defences had been built to counter previous threats for example the Saxon Shore forts or the forts of Henry VIII.

The 29 towers on the east coast are larger and more robustly built than the south coast examples. These towers were the main components in the coastal defences, linking Redoubts and Forts, protecting vulnerable points on the coast, and the neighbouring towers, and acting as invaluable support to the existing coastal batteries.

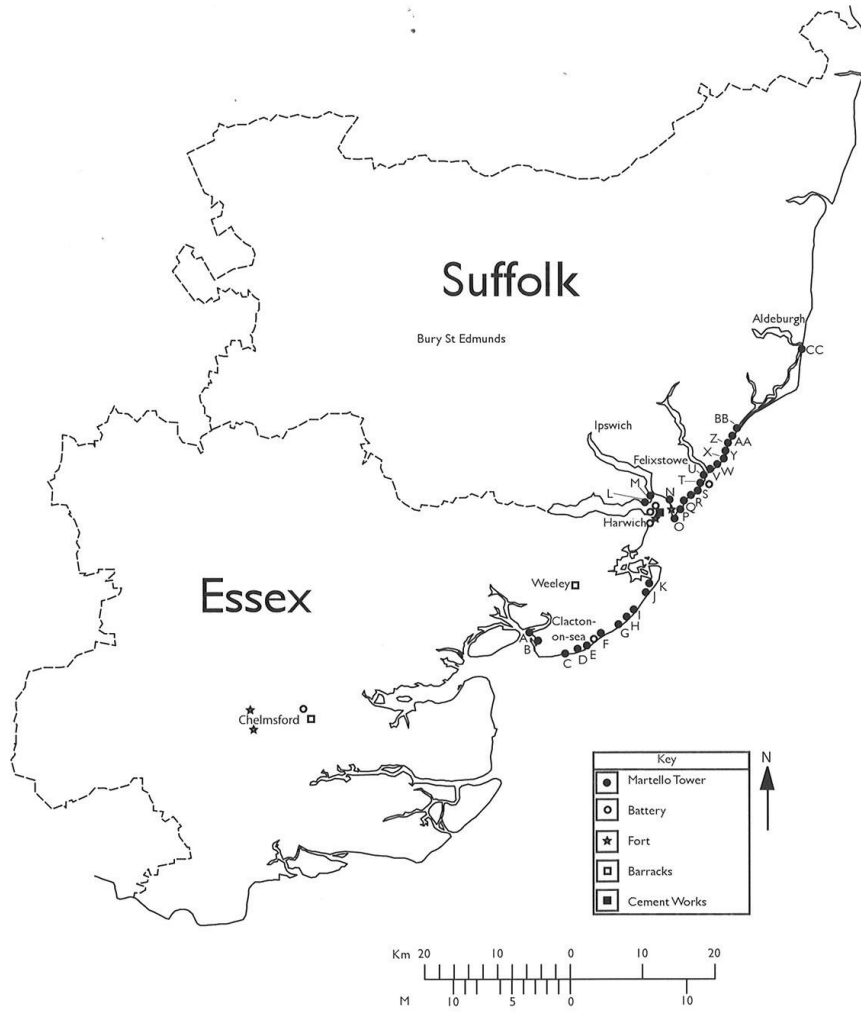
History

Origins

The name Martello is believed to come from a corruption of Mortella, a point in the bay of San Fiorenzo in Corsica, where there was a small tower which held out against two British warships for a prolonged period in September 1793. The tower was captured by the besieging British Army, which had landed some distance away and marched to the tower, a four-gun battery was set up and eventually after two days continuous bombardment the French were compelled to surrender as a shot had set fire to material used to reinforce the parapet. The events in Corsica made a significant impression on the soldiers and sailors involved, many of who were, in due course, senior British officers, and in positions to make crucial decisions with regard to the defence of the British Isles. The most notable in this group were Major General David Dundas, Lieutenant General John Moore and Admiral Sir John Jervis.

Martello towers were not the first defences of their kind to be constructed, since similar towers had already been built prior to the Corsican affair, notably in Jersey and Guernsey, where similar towers were erected during the 1780s.¹ The towers in the Channel Isles are not

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- | | |
|---|-------------------------------|
| A - Martello Tower & Battery | O - Site of Tower |
| B - Partial remains of Battery and Earthwork of Tower | P - Martello Tower & ROC Post |
| C - Martello Tower | Q - Martello Tower |
| D - Martello Tower | R - Partial remains of Tower |
| E - Martello Tower | S - Site of Tower |
| F - Martello Tower | T - Martello Tower |
| G - Site of Tower | U - Martello Tower |
| H - Earthwork remains associated with Tower | V - Earthwork of Tower |
| I - Earthwork remains associated with Tower | W - Martello Tower |
| J - Site of Tower | X - Site of Tower |
| K - Martello Tower & Battery | Y - Martello Tower |
| L - Martello Tower & partial remains of Battery | Z - Martello Tower |
| M - Martello Tower | AA - Martello Tower & Battery |
| N - Site of Tower | BB - Site of Tower |
| | CC - Martello Tower |

1. A plan showing the location of all sites referred to in the paper (© English Heritage)

particularly remarkable as they reflect an earlier realisation of the defensive potential of small artillery forts if sited properly and it is likely that the inspiration for them came from the same quarter, as there were similar towers all over the Mediterranean.

Between 1796 and 1815 194 towers were built in Britain and its dependencies, as part of a comprehensive defensive scheme and as a direct result of the British being at war with both France and the United States of America. In North America the construction of Martello Towers continued until 1873 when the Americans decided to abandon the building of towers at Key West prior to their completion. In Europe the construction of such towers had all but ended by 1815. By the 1850s developments in artillery meant that the towers were not strong enough to withstand an attack with the new Rifled Muzzle Loaders (RML). This swift obsolescence meant that many towers were promptly sold or adapted for other uses. The period between 1815 and the beginning of the Crimean War was also one of peace across Europe and defence spending was therefore much reduced from its previous level. This would clearly affect the wish of the military to retain the Martello towers.

The War Office gradually sold or abandoned the towers so as to save on the expense of their upkeep. As early as 1819 some were demolished having been sold for building materials.² One of the points initially put forward in favour of the towers was that once a threat had passed it was possible to 'mothball' the towers by withdrawing the guns inside and appointing a caretaker rather than maintaining a full garrison.

The east coast towers were both larger and better defended than their southern counterparts. There were originally 11 towers in Essex and 18 in Suffolk.³ Tower CC at Aldeburgh, the northern limit of the chain, is unique in design as it is larger than the other towers and intended to mount four 24 pdrs.⁴ The tower appears to be made up of four normal east-coast towers merged into one structure, and is quatrefoil in plan. It has been suggested that the design used to build tower CC was initially intended to serve on the south coast since the plans drawn up in 1804, by Brigadier General Twiss, recommended a four gun tower at Dymchurch which was never built.⁵

A circular casemate redoubt was built at Harwich, for ten guns, this was self-contained and designed to fire in every direction. Casemated accommodation for the garrison was built below the gun platforms; a deep ditch

with a revetted counterscarp and glacis surrounded the whole fort. It had been conceived of in 1806, work began in 1807 and the fort was completed in 1810. Originally a similar redoubt was intended for Aldeburgh but it was deemed too costly an undertaking to allow it to progress and it seems that it was at this stage that the quatrefoil tower was constructed instead.⁶

In most cases the batteries that were to be protected by the towers had been in existence since the 1790s when the threat of invasion from Republican France had seemed a reality.⁷ These batteries were of a roughly triangular shape, open at the back with the guns mounted on the top of them *terre plein* they were designed to fire *en barbette*. In Suffolk some of the batteries were paid for by subscription of the local people rather than being centrally funded.⁸

Planning the system

The idea of a chain of defensive coastal towers had first been mooted by Captain Reynolds in 1798 but this was dismissed. In 1803 when the threat of invasion once again appeared real a similar plan was resubmitted by Captain Ford.

Ford's plans were sent to Brigadier-General Twiss who forwarded them to General Sir David Dundas, who had besieged the Mortella Point tower; he in turn passed it to the Secretary of State for War and the Colonies, Robert Lord Hobart. After this the plans for towers were passed on to the Committee of the Royal Engineers, who agreed with the principle of towers but not the square design that had been submitted, which caused delays. The return of William Pitt as Prime Minister changed the political climate as he was enthusiastic for the towers to be built. He commissioned Twiss to find suitable sites and these were discussed at the Rochester Conference of 21 October 1804, the scheme, with round towers, was approved and construction along the south coast began in 1805 and on the east coast in 1810, although the Board of Ordnance had been acquiring land since 1808.⁹

Later history

Once the threat of invasion had gone many of the towers stopped being used by the military. Some of the towers went on to be used for other purposes, such as bases for the coastguard.

Many of the towers were re-fortified in subsequent national crises during the 19th century; the towers'

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armaments had been modernised in the 1850s to counter the increased tension with France, until it was realised that weapon technology had advanced sufficiently to make the towers obsolete.

Some of the towers were adapted to military use during both of the World Wars with many having concrete pillboxes constructed on their roofs to house infantry positions which were components of a nationwide defensive scheme, while others were used as Royal Observer Corps (ROC) posts. Tower D, Clacton-on-Sea, Essex, continued in use as an ROC post into the Cold War when the corps had changed its role to that of monitoring fall-out in the event of a nuclear attack.

Descriptions

The east coast towers are all three-storey brick-built, cam-shaped structures.¹⁰ Generally they are 55ft (16.7m) in diameter by 33ft (10m) high, the walls taper upwards, and are between 8ft (2.4m) and 11ft (3.3m) thick at the base and between 5ft (1.5m) and 8ft (2.4m) thick at the top. They were also up to 50% thicker on the seaward side than the landward.¹¹ There are three floors in all of the towers with the entrance at first floor level, which was reached either by means of a ladder or a drawbridge where a moat and glacis had been constructed. The first floor was divided into three parts, one for billeting the garrison of 24 men, one as a room for the commanding officer and another area was used as a quartermaster's storeroom. A musket rack ran around the central column with enough space to hold 27 guns. The floor at this level seems generally to have been one third stone flag, in the area over the magazine, and the other two thirds were composed of oak planking.

Given that the entrance was on the first floor the ground floor served as a basement and was entered through a trapdoor by means of a ladder. This cellar was used for the storage of provisions and munitions, with a third of the floor being walled off from the rest so that it could serve as the magazine. The magazine was lit with a lantern separated from the powder by glass to avoid any possibility of a spark causing an explosion.

Access to the roof level was by means of two staircases built into the walls which led from the rooms used by the garrison and the commanding officer, with the soldiers using one stair and the officer another. The towers were usually armed with a 24 pdr and two carronades. Howitzers were sometimes installed, instead of

carronades, as short-range guns with the intention of defending the tower in the event of a successful enemy landing posing a threat to the tower from the landward side or at close quarters.

Dry moats were built around some but not all of the towers. They are typically 16.5ft (5m) deep and 33ft (10m) wide, and were formed by constructing a perimeter brick wall and piling compacted soil against it to form a sloping outer surface.¹² Only Tower N, at Walton Ferry, was constructed with a cunette.

The towers were generally surrounded by a compound which was usually defined by a ditch and boundary stones, although an earthen bank was also sometimes present, Tower AA at Shinglestreet in Suffolk is the best preserved example showing all of these features. The compounds vary in size from over 4 acres (1.6 ha) to less than 1 acre (0.4 ha), this variability has meant that many of these features have not been assessed previously. Also noted within these areas were the remains of boathouses and artillery sheds. The presence of these other features and the batteries is a reminder that the towers were a component of a complex defensive scheme rather than the entire defence in their own right.

The East Coast Martello Towers

This section presents a gazetteer of all of the sites of Martello Towers, and other features associated with the Napoleonic defences of the Suffolk and Essex coasts that have been identified, the information below shows that more features survive than has been previously thought. A location map is included as fig 1.

Tower A, St Osyth's Point, Essex (NGR: TM 0830 1569) was built without a ditch and supported a forward battery of five guns, the tower is in good overall condition as are its Second World War additions. The forward battery is in the best state of preservation of all of the batteries along the east coast but has been built over by a recent housing development and slighted in places. However, it stands to its full height in a few areas and its former course can be traced as a line of rubble. It is currently used as an aviation museum.

Tower B, Point Clear, Essex (NGR: TM 0951 1474) was built with a moat and glacis and supported a forward battery of three guns, it was demolished in 1967 to make way for a housing development. The site of the tower is still visible as an earthwork on a patch of open ground adjacent to the house at no 6 Beacon Heights. The

forward battery survives in the garden of no 6 to a height of nearly 1m in places and is preserved to some extent over approximately two thirds of its original length. This site is within a gated community and access is restricted (colour fig 1).

Tower C, Jaywick, Essex (NGR: TM 1362 1285) was built without a ditch to support a forward battery of three guns. The modern sea wall is built on top of the battery, the site and shape of which is preserved in the V-shaped turn at one point in the sea defences. The tower is currently used as an audio-visual art gallery and has recently undergone a major programme of renovation and the addition of a modern rooftop metal and glass extension. Despite modern access being gained at ground level the tower is in very good overall condition.

Tower D, Clacton-on-Sea, Essex (NGR: TM 1614 1338) was built with a ditch to support a forward battery of five guns which has now gone as a result of coastal erosion and modern development. The modern sea wall and maintenance road are directly adjacent to the tower and this has led to the loss of nearly half of the tower's ditch. The ditch survives as a slight earthwork to the landward side of the tower which is on Clacton golf course and part of the land parcel enclosure ditch also still survives. The tower was altered by Second World War additions and pipes were driven through the wall by the ROC during the Cold War,¹³ it is presently derelict and in poor overall condition.

Tower E, Clacton-on-Sea, Essex (NGR: TM 1671 1376) was built without a ditch. The tower is in fair condition. It is currently derelict with all of the openings bricked up.

Tower F, Clacton-on-Sea, Essex (NGR: TM 1728 1430) was built with a moat and glacis in support of a forward battery of three guns. There is no trace of the forward battery surviving. A row of coastguard cottages was built on a portion of the War Department land by the 1860s, of which three still survive.¹⁴ Two War Department boundary stones survive although only one of these seems to be in its original position. The tower is used as a restaurant and has a coastguard lookout on the roof. The tower is in good overall condition with access to the tower gained at first floor level via the original iron drawbridge.

Tower G, Holland-on-Sea, Essex (NGR: TM 2145 1690) has left no obvious traces, it was sold for building materials in 1819; the spot which it used to occupy is now a sailing club.¹⁵

Tower H, Chevaux de Frise Point, Essex (NGR: TM

2234 1772) was demolished in 1819; however, some banks and ditches survive. These remains are very similar to the land parcel boundary banks and ditches seen around other sites, no sign of the tower is evident.

Tower I, Sandy Point, Essex (NGR: TM 2290 1823) was also demolished in 1819. There appear to be two slight earthwork banks which join up two existing water-filled ditches forming a land parcel reminiscent of the sites of other towers.

Tower J, Walton-on-the-Naze, Essex (NGR: TM 2532 2153) was demolished in the 1840s due to instability. Local tradition suggests that the tower was on the patch of open land in Martello Place but no evidence could be seen.

Tower K, Walton-on-the-Naze, Essex (NGR: TM 2508 2201) was built without a ditch and in support of a three-gun battery. The tower was formerly used as the generator room for the surrounding caravan park; it is currently derelict. Overall, this tower is in poor condition. The forward battery partially survives in the boat yard adjacent to the caravan site.

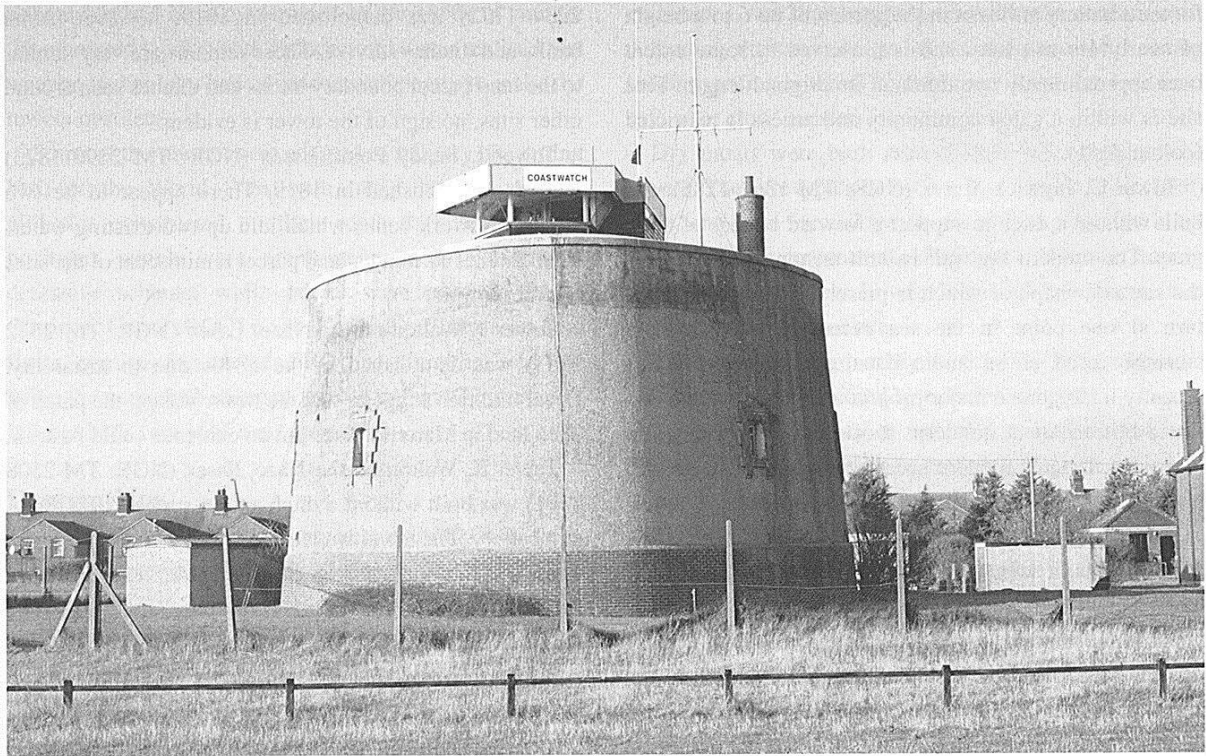
Tower L, Shotley Point, Suffolk (NGR: TM 2483 3366) was not visited as it was impossible to gain access to the former HMS *Ganges* site. This tower was built with a moat and glacis although previous work has noted that these have been filled in. From a distance the tower appears to be derelict but structurally sound. Work carried out by Suffolk County Council in 2000 noted that there appears to be the remains of the forward battery still surviving.¹⁶

Tower M, Shotley Point, Suffolk (NGR: TM 2513 3415) was not built to support a forward battery and was built without a ditch. It was not possible to get close to this tower as access proved impossible to the former HMS *Ganges*. The tower is in poor condition with large vertical cracks in the brickwork which may be as a result of the extra pressure on the building due to the water tank on the roof. It was noted that the tower appeared to be leaning slightly, which shows the extreme pressures which its fabric must be under.

Tower N, Felixstowe, Suffolk (NGR: TM 2764 3404) was built with a moat, glacis and cunette and accessed by a drawbridge; it was later incorporated into the Walton Battery¹⁷ to protect Harwich Harbour when it was a destroyer base. There were no signs of any features remaining as a result of harbour expansion in this area.

Tower O, Felixstowe, Suffolk (NGR: TM 2870 3194) does not survive; it appears that a combination of erosion

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2. Tower P, Felixstowe, Suffolk, 2003. (Stephen Dent)



3. Tower P, Felixstowe, Suffolk, entrance. (Charles Blackwood)

and more recent development have removed any traces.

Tower P, Felixstowe, Suffolk (NGR: TM 2927 3308) was built with a ditch. There is still slight evidence for the ditch around the tower; the observation point adjacent to the tower survives as a subtle platform. The lifeboat house and gun shed shown on an 1860s plan¹⁸ both survive as earthwork platforms. The tower has a National Coastwatch observation point on the roof. The tower is pebble-dash rendered which looks slightly weathered but the tower is in good overall condition. During the Cold



4. Tower U, Felixstowe Ferry, interior. (Charles Blackwood)

THE EAST COAST MARTELLO TOWERS

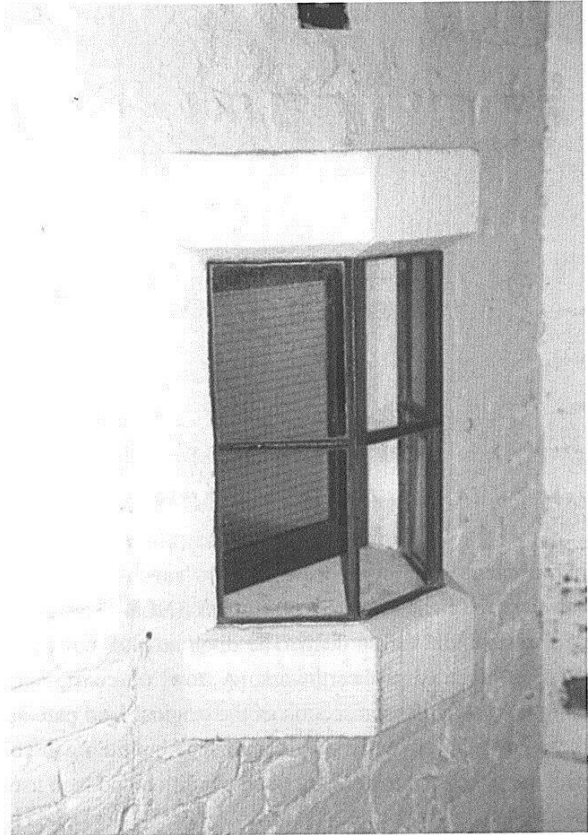
War the tower land parcel was used to site an ROC post which survives (colour fig 2).¹⁹

Tower Q, Felixstowe, Suffolk (NGR: TM 2992 3426) was built with a moat and glacis to support a battery of seven guns. The tower was converted to domestic use in the 1930s: a driveway has been driven through a cutting in the moat and glacis and the tower itself has had many windows and doors inserted as well as the parapet topped with crenellations. The condition of the tower is generally good.

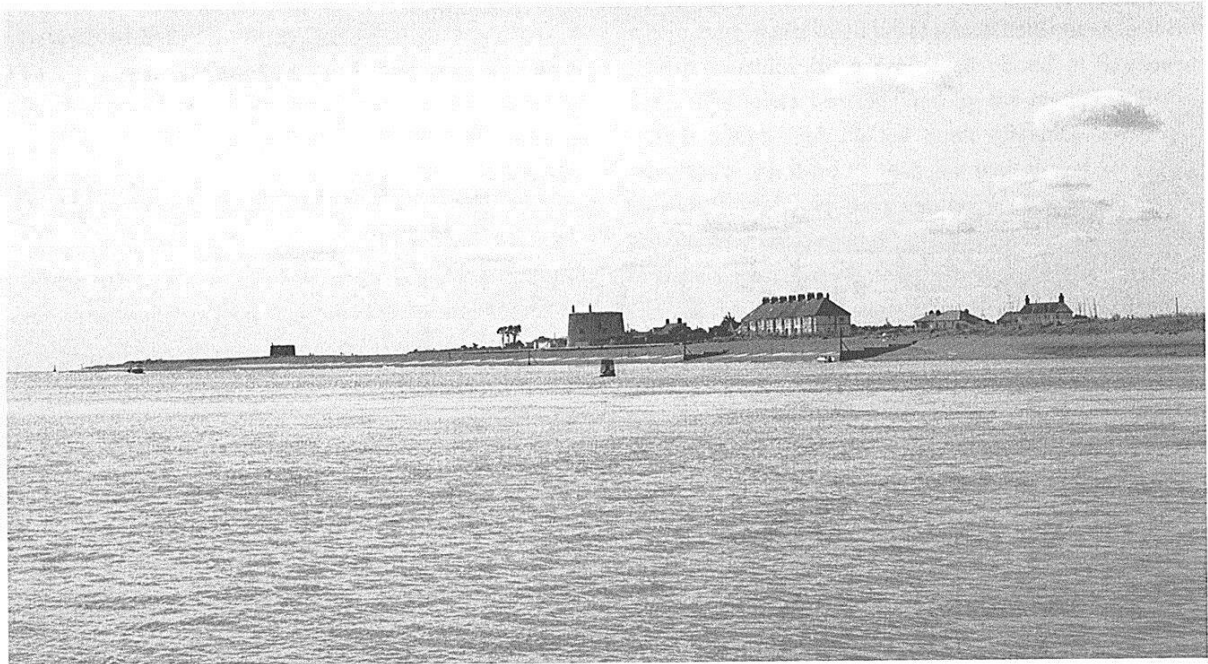
Tower R, Felixstowe, Suffolk (NGR: TM 3105 3475) was built with a moat and glacis. Tower R was thought lost for a long time but survives to the height of the glacis wall having been slighted and subsequently used as the boiler room underneath the Bartlet Hospital. The surviving portion of the tower appears to be around half the full height of the tower, with brickwork which is still in good condition and the moat and glacis are both equally well preserved.

Tower S, Felixstowe, Suffolk (NGR: TM 3169 3509) has left no visible remains. It seems to have been lost as a result of coastal erosion.

Tower T, Felixstowe Ferry, Suffolk (NGR: TM 3268 3663) was built with a ditch to support a forward battery of three guns. Around half of the ditch and an observation point have been lost or possibly concealed by golf course landscaping activities. Despite being derelict the tower is



5. Tower P, Felixstowe, Suffolk, internal window from the lighting passage into the magazine. (Charles Blackwood)



6. Towers T and U, Felixstowe Ferry, Suffolk, 2000. (Stephen Dent)

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7. Tower T, Felixstowe Ferry, Suffolk, from the air. (Charles Blackwood)

in fair overall condition.

Tower U, Felixstowe Ferry, Suffolk (NGR: TM 3285 3732) was built with a ditch. The ditch around the tower survives as a slight earthwork. A row of coastguard cottages was built on a section of the original land parcel; these have subsequently been demolished but their garden wall survives. The tower is in good condition and is in use as a house.



8. Tower W, Bawdsey, Suffolk, from the air, showing the coastal erosion. (Charles Blackwood)

Tower V, Bawdsey Manor, Suffolk (NGR: TM 3356 3771) was located within the land now owned by Bawdsey Manor, which is used as a boarding school, and as such access is restricted. The site of the tower, which has been demolished, is evident in the former rose garden; it is possible that buried remains of the tower may survive. There is no evidence for any ditch or ancillary buildings surviving.



9. Tower T, Felixstowe Ferry, Suffolk, from across the estuary of the River Deben, 2000. (Stephen Dent)

THE EAST COAST MARTELLO TOWERS



10. Tower Y, Alderton, Suffolk, from the air. (Charles Blackwood)



11. Tower Z, Alderton, Suffolk, from the air. (Charles Blackwood)

Tower W, Bawdsey, Suffolk (NGR: TM 3559 3975) was built with a ditch, which can still be seen as a subtle earthwork. An observation point can be seen as a platform to the south of the tower. Almost a quarter of the boundary ditch still survives. The tower is presently used as a house and is in good overall condition (colour fig 2).

Tower X, Bawdsey, Suffolk (NGR: TM 3580 4024) was built with a large ditch surrounding it. There were no traces of this tower surviving.

Tower Y, Alderton, Suffolk (NGR: TM 3577 4107) was built without a ditch and in support of a forward battery of three guns. The tower is in good overall condition and is presently undergoing conversion to a residence. A new glass and metal structure has been built on the roof.

Tower Z, Alderton, Suffolk (NGR: TM 3612 4195) was built without a ditch. The modern sea defences lie on the same site as those of the 19th century²⁰ and it therefore appears that the threat of erosion is limited in this area. None of the associated buildings have survived. The tower itself is derelict and in poor condition, around 70 percent of the outer brick skin has fallen off and the top third of the tower has been rendered at some point to try and preserve the building. This tower is little altered except for the erection of a Second World War pillbox on the roof. A quarter of the landward section of boundary ditch still survives.

Tower AA, Shinglestreet, Suffolk (NGR: TM 3660 4255) was built with a ditch and in support of a battery of three guns. The battery has been adapted to residential use and the rear half of the land parcel was delimited by a bank and ditch which survives intact, the associated boat house, shown on the 1860s plan,²¹ was still present as an

earthwork as well as all four of the original Board of Ordnance boundary markers. The tower is still surrounded by the slight earthwork of its ditch and was undergoing renovation so that it could be used as a house. The tower is in good overall condition and is the most complete site encountered as all of the ancillary buildings can be accounted for (colour fig 3). The battery is now converted to a dwelling.

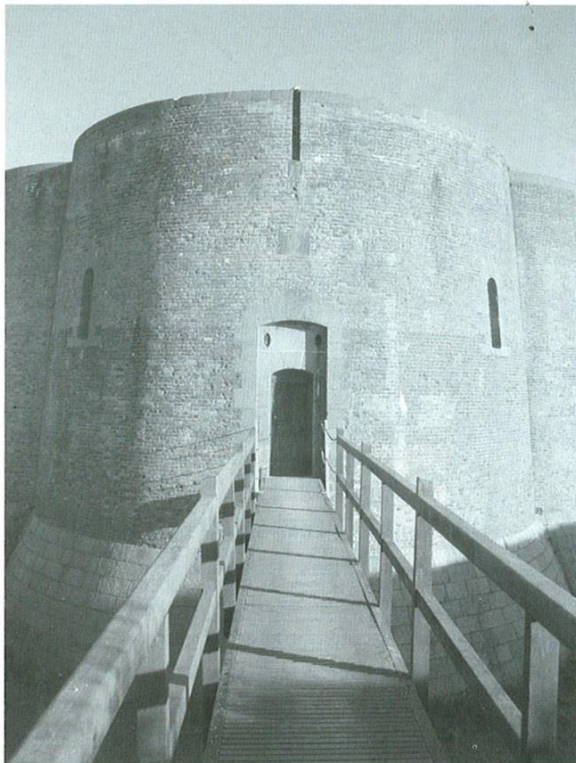
Tower BB, Shinglestreet, Suffolk (NGR: TM 3693 4302) was built with a ditch. No remains of this tower were visible. The site of this tower is identifiable by the Board of Ordnance boundary stones.

Tower CC, Slaughden, Suffolk (NGR: TM 4630 5491) is unique in being quatrefoil, being four normal east coast towers merged into one building, it is surrounded by a



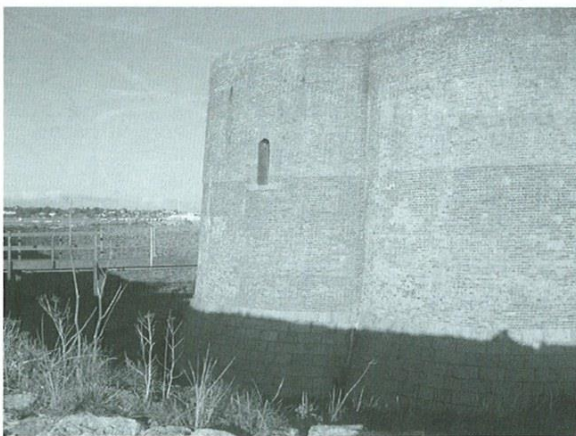
12. An aerial photograph of the unique quatrefoil Tower CC, Aldeburgh, Suffolk. (Damian Grady © English Heritage NMR: 23496/15 23 Apr 2004)

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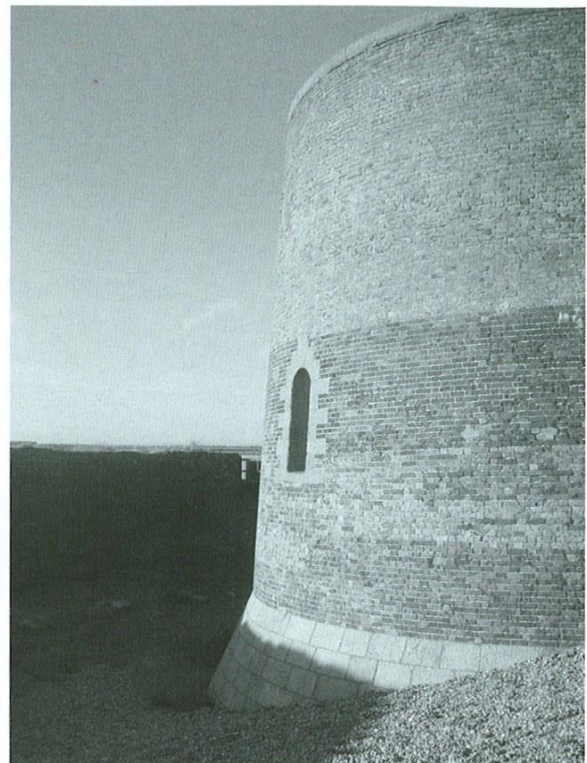


13. Tower CC, Slaughden, Suffolk. Entrance. (Paul Holford)

moat and glacis and had an armament of four 24 pdrs; it was built to support a battery of five guns. It has been suggested that this tower was a replacement for a proposed Redoubt Fort like that built at Harwich but that this scheme was halted due to the very high costs involved.²² The tower is generally in good condition although coastal erosion has destroyed the seaward third of the moat and glacis. Access to the tower is still by means of the first



15. Tower CC, Slaughden, Suffolk, showing bridge across moat. (Paul Holford)



14. Tower CC, Slaughden, Suffolk. (Paul Holford)

floor but the bridge is a modern replacement. The tower is owned by the Landmark Trust which lets it as holiday accommodation (colour fig 4).

The Harwich Cement Works

The Harwich Cement Works (NGR: TM 2615 3271) was set up in 1811 to supply the Board of Ordnance with cement.²³ The boundary wall has survived intact, and two Board of Ordnance boundary markers still remain in situ on the southern side of the site. The land within the walls was ceded to the coastguard in 1858 when the present cottages were built.

Batteries and forts

No above-ground remains of the Bathside (NGR: TM 2586 3245) or Angelgate (NGR: TM 2617 3276) batteries in Harwich, Essex, remain, they have both been lost to modern development of the port and harbour facilities. The Angelgate battery is now overlain by Navigation House.²⁴ Although no remains of the Bathside battery survive above ground it was shown to have survived as sub-surface remains which were partially excavated in 1998.²⁵

The Harwich Redoubt (NGR: TM 2615 3216) is in good condition, having been cleared by local volunteers from 1969 onwards, and is being used as a museum. A magnetometer survey of the moat has shown that there are further cannon buried within it.

Beacon Hill Fort, Harwich, Essex (NGR: TM 2619 3174) not visited. During the Napoleonic period there was a battery on this site but that fell into the sea in the 1820s. Despite the dereliction and vandalism the remains on this site are in fair condition.²⁶

Landguard Fort, Felixstowe, Suffolk (NGR: TM 2837 3192) not visited, was strengthened during the Napoleonic Wars and much of what remains today is of late 18th- or early 19th-century date. The site is in good condition, and is in the guardianship of English Heritage but is run by the Landguard Fort Trust who administer the site as a heritage attraction and museum under a local management agreement.²⁷

Barracks

Weeley Barracks, Weeley, Essex (NGR: TM 147 223) were built in 1803 to house the garrisons of the Martello Towers in the Essex district as the section of coast was believed to have a detrimental effect on the soldiers' health. It was demolished in 1814 and the bricks used to build another barracks at St Osyth.²⁸

Danbury Camp, Danbury Common, Essex (NGR: TL 7804 0450) was used throughout the Napoleonic wars as a base for soldiers within this area, there are not thought to be any remains on this site but it has been identified through previous documentary research. The site appears to have been temporary and used for training and holding militia troops.

Chelmsford

Chelmsford and environs were heavily fortified from 1803 onwards. The system of defences was known as the Chelmsford Entrenchments. Pieces of this network still survive. These defences were supposed to block an enemy advance on London, it was soon realised that they could be easily out-flanked and were abandoned in 1814.

Galleywood Common (NGR: TL 7032 0264) is the site of an artillery fort, possibly an earthwork redoubt, that was supported by outwork batteries. The remains of sections of the rampart and ditch still survive as do two of the barbette batteries.

The Star Battery, Widford (NGR: TL 6967 0491) is the

site of an artillery fort which was support by outwork batteries, similar to the remains at Galleywood.

A gun battery has been identified near to Danbury (NGR: TL 7742 0475). The trace appears crude and it is unclear whether it was a practice work or whether it was built by untrained militiamen.²⁹

Conclusion

There are 17 complete Martellos along the coasts of Essex and Suffolk in varying condition; they are however, more often in good condition than in bad. There is also Tower R which has been reduced to half its original height and incorporated into a hospital. There are four of the forward batteries which survive although even one of these is only as buried remains; of these the most pleasing discovery was at the site of Tower B as the remains in this area were believed to have been completely destroyed. Of the isolated batteries only in the case of the Bathside in Harwich has it been possible to prove that there are surviving remains, and those are sub-surface.

Four towers or their sites have been identified because earthworks were apparent on these sites; many associated features were also identified in this way and this has led to a far clearer picture of the complexity of the defensive scheme in this area. Many of the ancillary buildings appear to be of a later date than the towers and batteries and seem to illustrate the continued use and adaptation of these structures throughout the 19th century, and indeed in many cases into the 20th century when many of the towers were requisitioned during both of the World Wars and to a lesser extent during the Cold War.

The discovery of many ancillary features and earthwork remains has illustrated that the scale of destruction previously noted is not uniformly the case and that there are remains associated with these towers throughout their history which remain and prove an excellent source of information regarding changing threats and defence solutions.³⁰

Acknowledgements

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Notes

1. Coad 1990, 8.
2. Cowie 1979.
3. Mead 1948, 214.
4. Saunders 1989, 143.
5. Sutcliffe 1972, Clements 1998, <http://www.martello-towers.co.uk>
6. Saunders 1989, 143.
7. Cowie 1979, 606.
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10. Anon 1889.
11. Breen & Sommers 2002.
12. Telling 1997.
13. <http://www.ukcoldwar.org.uk/>
14. WORK 43/438//38.
15. WO 78/1748/2.
16. Breen & Sommers 2002.
17. WO 78/5138.
18. WORK 43/438//41.
19. <http://www.ukcoldwar.org.uk/>
20. WORK 43/438//49.
21. WORK 43/438//50.
22. Sutcliffe 1972; Saunders 1989.
23. MPH 1/839.
24. Went 1999.
25. Medlycott 1998.
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27. Pattison 2005.
28. <http://www.stosyth.gov.uk>
29. Jecock & Ainsworth forthcoming.
30. All of the information in this paper is taken from a more detailed report, Millward 2007.

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SUFFOLK RECORD OFFICE, IPSWICH

HD 79/B1: Minute Book of Subscribers to the Militia 1794-7

NATIONAL ARCHIVES / PUBLIC RECORD OFFICE

MPH 1/839: Two items extracted from WO 55/2404 Essex (i) 'A survey of the Ordnance lands at Harwich' Scale: 1 inch to 130 feet (ii) 'The town of Harwich' town plan Scale: 1 inch to 65 feet 1811.

WO 78/1748/2: Plan Shewing the Position of the Martello Towers, Batteries, &c. in the Eastern District. From No 1, to No 27 1816.

WO 78/5138: Sheerness, Medway, Thames and Harwich Area: Harwich Defences: Walton Battery and Martello Tower 1810-72.

WORK 43/438//38: Martello Towers: Plans: Tower F 1867.

WORK 43/438//41: Martello Towers: Plans: Tower P 1867.

WORK 43/438//49: Martello Towers: Plans: Tower Z 1867.

WORK 43/438//50: Martello Towers: Plans: Tower AA 1867.



Martello Tower W, Bawdsey, Suffolk, showing the level of coastal erosion in this area. (Steve Cole © English Heritage NMR: DP046351)

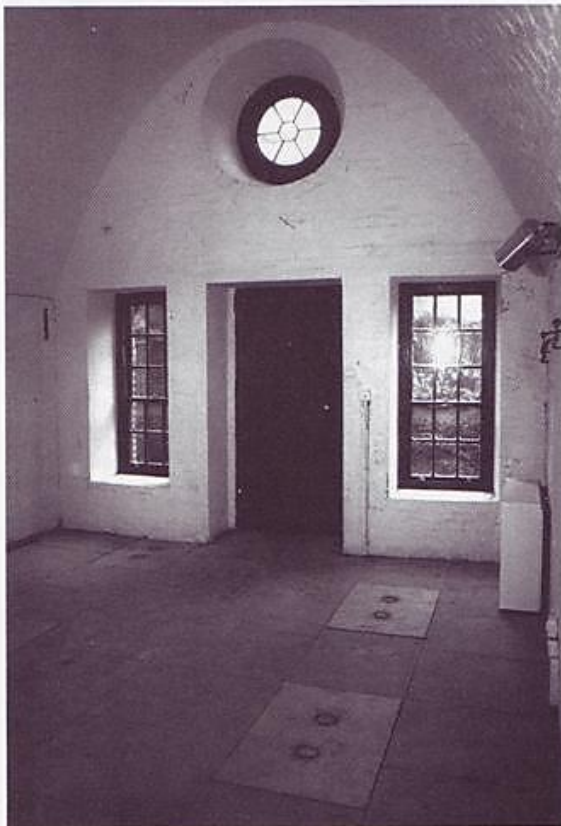


Tower U, Felixstowe Ferry, Suffolk. (Stephen Dent)

'NECESSARIES' in UK FORTS and BATTERIES
John Goodwin

Reports about 19th century coastal fortification usually explain its purpose, design and armament. This article is about services, seldom mentioned but essential if the garrison was to do its job effectively.

In all permanent defence works provision had to be made for water storage, cooking facilities, sanitation, lighting, and heating. In the earlier and usually smaller forts and batteries these were basic, crude, and often uncomfortable. In the much larger coastal forts built later in the C19th the facilities improved only slowly but greater attention was paid to the health of the garrison.



Water tanks beneath a casemate in Eastbourne Redoubt (Andrew Goodwin)

The water supply

Engineers estimated that each soldier used four gallons of water daily for drinking, cooking and washing. General Lewis advocated between three and ten gallons. Other demands, cleaning, sponging out guns after discharge and sometimes watering horses could not be easily quantified but had to be met. Water storage capacity is sometimes, but not always, shown on fort plans and although it probably had some relationship to the size of garrisons in peace and war the quantities vary widely as the following examples, in gallons, of South Coast smaller forts and batteries show:

Langley Fort 3,200	Freshwater Redoubt 16,400
Eastbourne Redoubt 13,000	Needles 10,000
Blatchington Battery 5,000	Dungeness Battery 1,000
Dymchurch Redoubt 7,700	

As might be expected most forts depended on wells, often dug on the edge of the parade ground. Even where there was a well it was usually supplemented by ingenious devices for the collection of rainwater. Gutters on the roof and gun floor, or other catchment areas, were used to collect rainwater and pipe it into cisterns.

Sometimes it was passed through a simple filtering system of shingle and charcoal. Water carts topped up cisterns in places where wells could not be dug or rainwater was insufficient.



Empty water tank in base of Martello Tower 73. Base of rising central pillar at left (Andrew Goodwin)

Within a fort the distribution of water was by standpipes and hand pumps connected to tanks and cisterns of which there might be several.

Martello Towers on the South Coast had no well inside the tower although they were sometimes dug outside for peacetime convenience. General Pasley writing in 1822 said that some English towers had a water reservoir with a nine-inch floor built into the foundations. This is confirmed by an 1805 plan of a tower in Folkestone, which noted that later towers had a tank installed in a storeroom instead. A pipe system fed rainwater from roof gutters into cisterns. These usually stored 800 gallons, but the larger and later Pembroke towers in Milford Haven had room for over 4,500 gallons.

Water was usually stored in rendered brick or slate lined reservoir tanks underneath the parade ground, or beneath the floor of casemates. The building of larger forts in the second half of the C19th coincided with Public Health Acts of 1848 and 1875, which led to the development of waterworks, and pipe networks in towns. In military medical circles there was also greater recognition of the importance of clean water for the health of troops. Even so it seems many years passed before all the new forts under construction were connected to the waterworks of nearby towns.



Iron cisterns, Hurst Castle (John Goodwin)

On the Isle of Wight Freshwater Redoubt, the Needles batteries and Hurst Castle on the Solent continued to rely

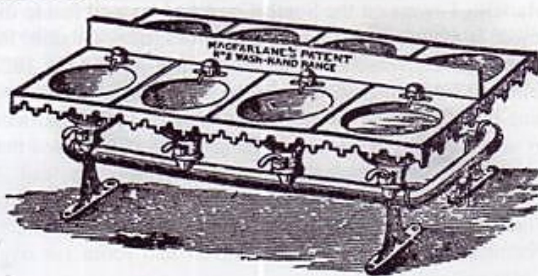
on stored rainwater for most of the C19th.

The Keep at Golden Hill Fort had a well with a wind pump and at Yaverland Fort a steam pump raised water from Sandown. Newhaven Fort built in Sussex in the 1870s had five underground water tanks holding 24,000 gallons and rainwater tanks for another 91,000 gallons. It was not connected to the local water works until after 1886.

The sea forts off Portsmouth had deep bore artesian wells; that at Spitbank produced 1,400 gallons an hour and Nomansland 23,600 gallons daily. Nothe Fort at Weymouth had a large brick and tile tank 14 feet (4 meters) deep under the parade ground. The well at Grain Fort (Medway River) was under the parade near No 2 caponier and a capstan and horse were used to raise water. Round Chatham, Fort Horstead was supplied from a reservoir under the rampart that fed tanks at nearby forts Borstal, Luton and Bridgewood. On Portsdown Hill a spring at the back of Fort Purbrook produced enough water to be pumped from Farlington Redoubt to other forts on the Hill.

Within the later forts there was usually piped water from cisterns to the cookhouse, ablutions and occasionally latrines. There was seldom provision for hot water outside the cookhouse except for basins and baths in hospital accommodation. The 1860 Sanitary report conceded that where the bathhouse was at some distance a boiler could be allowed if the soldiers paid for fuel to heat it.

Some things take a long time to change - in 1943 I was stationed in Maryhill Barracks, Glasgow and still had to go outside to the Public Baths, as there were few inside the barracks.



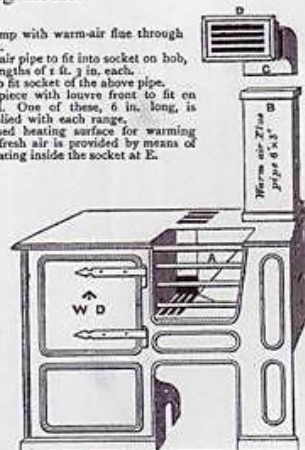
Iron washbasins for ablutions; Macfarlane of Glasgow (NA WO 33/9)

In the fort the troops washed and did their laundry in a casemate fitted up as an ablution room. Otherwise it was done outside in a separate hut or brick building. Washbasins were installed on the basis of one to ten men, and one bath to 100 men. Benches were provided for the men to sit and wash their feet, and pegs to hang up their clothes. The walls of ablution rooms were supposed to be white-washed and well ventilated although it seems this was not always done. In Eastbourne and Dymchurch Redoubts the ablutions room was inside a casemate with drainage into a cesspool in the ditch. There was only one bath in a corner casemate. In Langley Fort the men washed in an outhouse adjacent to the coal yard. In Shoreham Fort the ablution room was in an outhouse next to the cookhouse. At Fort Blockhouse it was in one of the corner bastions and at Longhope Battery it was a separate building on the parade ground. In the Royal Commission forts the design was adaptable allowing almost any casemate to be designated for use as an ablution room or cookhouse.

The Cookhouse

Within a fort the cookhouse was a substantial user of water and it usually had a piped supply from cisterns. The cookhouse was either in a casemate adapted for the purpose, or in a separate building often on the outside wall of the fort. At Fort Clonque it was in a caponier. The fuel used was coal and all forts had a coal yard and an ash pit, the ashes being used for earth closets. War Office guidance on cookhouses was that they should be light and ventilated by louvres in the roof, or by shafts at least 12 inches (30.5 mm) square, over each boiler. The fixed equipment was basic comprising half company iron boilers set in brickwork with cast iron grates, frames and ash pits. Ovens were not always installed - a frequent cause of complaints. Cooking involved boiling soup, rice, vegetables and stews. As the fire was directly under the boiler there was no means of regulating the heat and the cook had to watch carefully to avoid the contents being burnt. It was accepted that this system was wasteful of fuel, and cooks were told that steam should be allowed to escape from the pot only when the cover was raised, otherwise the finer and more rich and savoury particles of food would be lost. Aware of the confusion in a crowded cookhouse a long table was recommended to separate the cooks from the men when serving meals.

- A. Fire lump with warm-air flue through back.
 B. Warm-air pipe to fit into socket on hob, in lengths of 1 ft. 3 in. each.
 C. Bend to fit socket of the above pipe.
 D. Mouthpiece with louvre front to fit on bend. One of these, 6 in. long, is supplied with each range. Increased heating surface for warming the fresh air is provided by means of a grating inside the socket at E.



Small range for a cookhouse (Galton)

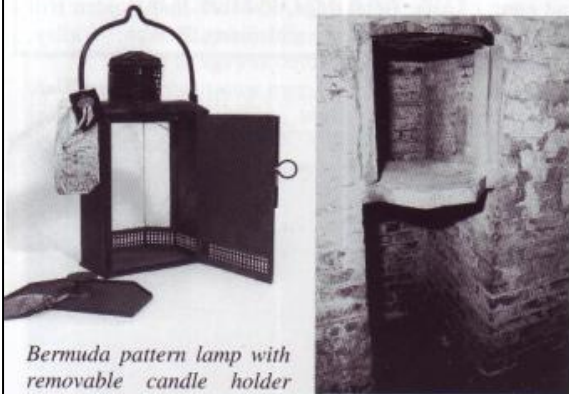
Following an enquiry in 1863 the cooking arrangements in forts on the South Coast were criticised. At Western Heights and

Drop, all three kitchens needed replacing. At Drop Redoubt four boilers were bad and the men complained they could not bake. Two new boilers and an oven were needed at Shoreham Fort. At Langley Fort the old boilers were not in use and an oven was wanted. Fort Cumberland, Point Battery, Blockhouse Fort and Fort Monkton at Portsmouth all lacked a roasting oven. Once built, a fort or coastal battery, unless used regularly to house troops, continued on a care and maintenance basis for many years often without much change or improvement in its facilities. Many were only properly opened up as temporary barracks to accommodate troops or volunteers in summer camps or on manoeuvres.

Lighting

Lighting in forts was by oil lamps, lanterns and candles until well towards the end of the C19th. Many forts and batteries never had gas or electric lighting installed unless they were used for permanent barrack accommodation. It was too costly. FSG members will recall the unlighted inky black passages and casemates in some of the older forts around Portsmouth, Chatham and Milford Haven.

The absence today of gas and electrical fittings is evidence that these services were never installed.



Bermuda pattern lamp with removable candle holder (NAM) and recess in a fort passage for a lamp (Andrew Goodwin)

The stores department issued many types of oil lamps: Passage, fighting, magazine, wall, overhead, Bermuda pattern, Both Ways and Tremletts give some idea of the variety. As late as 1869 a War Office Committee decided that a candle with three wicks in a lantern was even superior to that of an oil lamp. Candles apparently gave a brighter light for eight hours and did away with the need to trim the wick. Lanterns were lit and placed in wall niches at entrances and bends in passages. Several might be needed in a large casemate. In the bigger forts there was a lamp room where lamps could be serviced daily. In smaller batteries lamps were filled and trimmed on a bench in the artillery storeroom. Lamp changing was a regular duty and a special cart (*below, John Goodwin*) to carry them around was on display at New Tavern fort during the FSG visit in 2007.

Some early forts - Golden Hill, Blockhouse and Gomer always used candles. Gas lighting spread across Britain in the latter half of the 19th



century and at some date Forts Monkton, Gilkicker, Rowner, Brockhurst, Grange, Lumps, the Hilsea Lines and Southsea Castle had gas lighting installed, a luxury not possible in more remote locations. Even gas lighting had its critics. A Professor of Military Hygiene wrote in 1890 'the present system of gas lighting of barrack rooms was insufficient and injurious to the eyes'. Electric lighting replaced gas much later and apparently took second place to the generation of electricity for communication and fighting equipment. Thus controlled minefields were introduced in 1870, Brennan torpedo installations in 1881 and the Watkins Position Finder in 1886. As a result of these developments fort layouts had to be adapted to include engine, test and accumulator rooms.

The installation of electric searchlights in coast forts was another late 19th century lighting development. It was not until the 1890s that experiments on the Isle of Wight

demonstrated the need for searchlights against torpedo boat attacks. Early Defence Electric Lights as they were known needed a steam engine and dynamo with cables connected to a lamp and projector mounted in a frame, which was turned by hand wheels.

Heating and Ventilation

Some form of heating was necessary in a coastal fort or battery for the comfort of the garrison. Often the most striking feature of a fort from outside is a row of chimney pots barely hidden by the slope of the ramparts. Open fires with flues were connected to chimneys on the roof often capped by cowls where wind conditions were troublesome. As an ordinary fireplace burning coal was not very effective for heating large areas a device known as a ventilating fireplace, utilising spare heat was designed to both heat and ventilate casemates. Captain Sir Douglas S Galton, an engineer officer advocated the use of the ventilating fireplace for barrack rooms (*below, Eastbourne Redoubt, Andrew Goodwin*).



He seems to have improved existing grates for he says that they had never been patented and manufacturers seldom suggested their use, presumably preferring to push their own more complicated and profitable fires. An air chamber, not

connected to the flue, was made around the back and sides of the fire grate through which a draft of outside air would hot up and exit from a grill above the fireplace. Simple and effective.

Right, technical details of a casemate heating system (Galton)

This was said to heat a casemate satisfactorily, but only if sufficient coal was provided for a good fire. Those responsible for designing the Royal Commission forts were agreed that fireplaces in casemates were necessary. The reason given was that in time of need the fort garrison would have to be doubled to service all the guns hence the need to heat all possible accommodation.

An enquiry that dealt with the heating and ventilation issue found that casemated barrack rooms made the worst kind of accommodation for troops and recommended they be used only temporarily or during a siege. It was pointed out that while casemates were so built to save life as they were also calculated to destroy life by inducing sickness. In Minutes of evidence to the Sanitary Commission a sergeant witness was asked if he



went into barrack rooms before the reveille. He replied "Yes and there is a very nasty smell, quite sickening." Sometimes the sole ventilation was an opening opposite the door leaving the inmates to live in what was a draughty archway. Other casemates were low, narrow and dark where the air could not be renewed. The best casemates were said to be at Dover Citadel and the Prince of Wales Redoubt at Plymouth. The worst were at Fort George, Dover Castle, Chatham, and Carlisle Fort. At this time there were 1,300 men living in casemates at Dover, 910 in the Portsmouth forts and 400 at Plymouth. It was also found that poor ventilation and overcrowding in casemates led to high sickness rates. Fort Cumberland, Blockhouse Fort and Fort Monkton all needed ventilation shafts to make them habitable.

Sanitation

According to General Lewis students at the Chatham School of Military Engineering used to be taught that a fortress once surrendered because the latrines were destroyed by enemy fire and the inconvenience was so great that the garrison could not stand it. English towns only began to develop proper sewage disposal systems after the Public Health Act of 1848 but much of the legislature was permissive and it took several outbreaks of cholera and further Public Acts up to 1888 before the safe disposal of sewage in towns became mandatory and the pollution of streams and rivers was reduced.



Dry earth closet using ash (Santo Crimp)

In most forts and batteries the usual latrine facility was a dry earth closet or pail sometimes

linked to a cesspit. At night urine tubs were placed in the living casemates.

All of these needed emptying by carts, incineration, or spreading over land. Although reports in 1863 recommended replacement by water closets it was to be many years before these were in general use. Some fort plans refer to latrines, privies or earth closets (EC), and in the smaller defences they appear to have been sited anywhere, but usually outside and open to the air. There were separate latrines for men and women. General Lewis said they should not be put in confined spaces or in passages near casemates where they were liable to become dangerous nuisances. He recommended siting them in the counterscarp of the ditch of a retrenchment, the reverse slopes of a rampart, or the roof of a gorge caponier. Reference was made to them being 'noisome places' if regulations for cleanliness were not strictly observed.

For forts immediately on the coast, sewage was discharged untreated into the sea. Many of the

Portsmouth and Isle of Wight forts used this method. On the Isle of Wight, Steyne Wood and Cliff End Batteries had earth closets; Bembridge, Redcliff, and Golden Hill had cesspits in the ditch and Forts Nelson, Widley, Southwick and Purbrook stored sewage in tanks.

Fisheye view of late C19th open water latrines and slate stalls at Eastbourne Redoubt (Andrew Goodwin)



Cumberland Fort, Southsea Castle, Lumps Fort and Sandown Barrack Battery were eventually connected to the town sewers. At Grain Fort the latrines were in the counterscarp galleries, at Fort Wallington in a separate block on the edge of the parade ground. At Fort Victoria they were behind the protection of the parados. Martello Towers appear to have had no latrines other than a bucket. Very few examples of early 19th century fortress latrines and earth closets exist today.

Conclusion on Necessaries

Once installed in a coastal fort the services described often continued unchanged for many years and were no better or worse than those existing in towns, not perhaps so unusual as some defence works waited years for their full complement of guns to be supplied. Well before the end of the 19th century it was realized that most of the Royal Commission works had been rendered obsolete by developments in tactics and artillery and were not worth updating. Thus only those forts or batteries which could be used as barracks or summer camps for the militia, or for training purposes, continued to have any money spent on them for improvement.

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Dromotheriidae, and apparently showing decided traces of reptilian affinity. It may be added that a few traces of mammals have been obtained from the English Wealden, among which an incisor tooth foreshadows the rodent type.

AUTHORITIES.—The above article is partly based on that by Sir W. H. Flower in the 9th edition of this work. See also O. Thomas, Catalogue of Monotremata and Marsupialia in the British Museum (1888); "On *Caenolestes*, a Survivor of the *Epanorthidae*," *Proc. Zool. Soc. London* (1895); J. D. Ogilby, Catalogue of Australian Mammals (Sydney, 1895); B. A. Bensley, "A Theory of the Origin and Evolution of the Australian Marsupialia," *American Naturalist* (1901); "On the Evolution of the Australian Marsupialia, &c.," *Trans. Linn. Soc.*, vol. ix. (1903); L. Dollo, "Arboreal Ancestry of Marsupials," *Miscell. Biologiques* (Paris, 1899); B. Spencer, "Mammalia of the Horn Expedition" (1896); "Wynyardia, a Fossil Marsupial from Tasmania," *Proc. Zool. Soc. London* (1900); J. P. Hill, "Contributions to the Morphology of the Female Urino-genital Organs in Marsupialia," *Proc. Linn. Soc. N. S. Wales*, vols. xxiv. and xxv.; "Contributions to the Embryology of the Marsupialia," *Quart. Journ. Micr. Science*, vol. xliii.; E. C. Stirling, "On *Notoryctes typhlops*," *Proc. Zool. Soc. London* (1891); "Fossil Remains of Lake Cadibona," Part I, *Diprotodon*, *Mem. R. Soc. S. Australia*, vol. i. (1889); R. Broom, "On the Affinities of *Thylacoleo*," *Proc. Linn. Soc. N. S. Wales* (1898); H. F. Osborn, "Mesozoic Mammalia," *Journ. Acad. Nat. Sci. Philadelphia*, vol. ix. (1888); E. S. Goodrich, "On the Fossil Mammalia from the Stonesfield Slate," *Quart. Journ. Micr. Science*, vol. xxxv. (1894). (R. L.)*

MARSUPIAL MOLE (*Notoryctes typhlops*), the "Ur-quamata" of the natives, an aberrant polyprotodont from central South Australia, constituting a family (*Notoryctidae*). This is a small burrowing animal, of a pale golden-yellow colour, with long silky hair, a horny shield on the nose, and a stumpy leathery tail. The feet are five-toed, and the third and fourth toes of the front pair armed with enormous claws adapted for digging. Neither ear-conches nor eyes are visible externally. There are but three pairs of incisor teeth in each jaw, and the upper molars are tricuspid. This animal spends most of its time burrowing in the sand in search of insects and their larvae, but occasionally makes its appearance on the surface.



Marsupial Mole (*Notoryctes typhlops*).

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MARSUS, DOMITIUS, Latin poet, the friend of Virgil and Tibullus, and contemporary of Horace. He survived Tibullus (d. 19 B.C.), but was no longer alive when Ovid wrote (c. A.D. 12) the epistle from Pontus (*Ex Ponto*, iv. 16) containing a list of poets. He was the author of a collection of epigrams called *Cicuta* (hemlock)¹ from their bitter sarcasm, and of a beautiful epitaph on the death of Tibullus; of elegiac poems, probably of an erotic character; of an epic poem *Amazonis*; and of a prose work on wit (*De urbanitate*). Martial often alludes to Marsus as one of his predecessors, but he is never mentioned by Horace, although a passage in the *Odes* (iv. 4, 19) is supposed to be an indirect allusion to the *Amazonis* (M. Haupt, *Opuscula*, iii. 332).

See J. A. Weichert, *Postarum latinorum vitae et reliquiae* (1830); R. Unger, *De Dom. Marsi cicuta* (Friedland, 1861).

MARSYAS, in Greek mythology, a Phrygian god or Silenus, son of Hyagnis. He was originally the god of the small river of the same name near Celaenae, an old Phrygian town. He represents the art of playing the flute as opposed to the lyre—the one the accompaniment of the worship of Cybele, the other that of the worship of Apollo. According to the legend, Athena, who had invented the flute, threw it away in disgust, because it distorted the features. Marsyas found it, and having acquired great skill in playing it, challenged Apollo to a contest with his lyre. Midas, king of Phrygia, who had been appointed judge, declared in favour of Marsyas, and Apollo punished Midas by changing his ears into ass's ears. In another version, the Muses were judges and awarded the victory to Apollo, who tied Marsyas to a tree and flayed him alive. Marsyas, as well as Midas and Silenus, are associated in legend with Dionysus and belong to the cycle of legends of Cybele. A statue of Marsyas was set

¹ According to others, a reed-pipe made of the stalks of hemlock; the reading *scutilla* (whip) has also been proposed.

up in the Roman forum and colonies as a symbol of liberty. The contest and punishment of Marsyas were favourite subjects in Greek art, both painting and sculpture. In Florence there are several statues of Marsyas hanging on the tree as he is going to be flayed (see GREEK ART, fig. 54, Pl. II.); Apollo and the executioner complete the group. In the Lateran museum at Rome there is a statue representing Marsyas in the act of picking up the flute, a copy of a masterpiece by Myron (Hyginus, *Fab.* 167, 191; Apollodorus i. 4, 2; Ovid, *Metam.* vi. 382-400, xi. 145-193), for which see GREEK ART, fig. 64 (Pl. III.).

MARTABAN, a town in the Thaton district of Lower Burma, on the right bank of the Salween, opposite Moulmein. It is said to have been founded in A.D. 573, by the first king of Pegu, and was once the capital of a powerful Talaing kingdom; but it is now little more than a village. Martaban is frequently mentioned by European voyagers of the 16th century; and it has given the name of "Martavans" to a class of large vessels of glazed pottery, also known in India as "Pegu jars." It was twice captured by the British, in 1824 and 1852. The Bay of Martaban receives the rivers Irrawaddy and Salween.

MARTELLO TOWER, a kind of tower formerly used in English coast defence. The name is a corruption of Mortella. The Martello tower was introduced in consequence of an incident of the French revolutionary wars. In September 1793 a British squadron of three ships of the line and two frigates was ordered to support the Corsican insurgents. It was determined in the first place to take a tower on Cape Mortella which commanded the only secure anchorage in the Gulf of San Fiorenzo. This tower, according to James, was named "after its inventor"; but the real derivation appears to be the name of a wild myrtle which grew thickly around. The tower, which mounted one 24-pounder and two 18-pounders on its top, was bombarded for a short time by the frigates, was then deserted by its little garrison, and occupied by a landing party. The tower was afterwards retaken by the French from the Corsicans. So far it had done nothing to justify its subsequent reputation. In 1794, however, a fresh attempt was made to support the insurgents. On the 7th of February 1400 troops were landed, and the tower was attacked by land and sea on the 8th. The "Fortitude" and "Juno" kept up a cannonade for 2½ hours and then hauled off, the former being on fire and having sixty-two men killed and wounded. The fire from the batteries on shore produced no impression until a hot shot set fire to the "bass junk with which, to the depth of 5 ft., the immensely thick parapet was lined." The garrison of thirty-three men then surrendered. The armament was found to consist only of two 18-pounders and one 6-pounder. The strong resistance offered by these three guns seems to have led to the conclusion that towers of this description were specially formidable, and Martello towers were built in large numbers, and at heavy expense, along the shores of England, especially on the southern and eastern coasts, which in certain parts are lined with these towers at short intervals. They are structures of solid masonry, containing vaulted rooms for the garrison, and providing a platform at the top for two or three guns, which fire over a low masonry parapet. Access is provided by a ladder, communicating with a door about 20 ft. above the ground. In some cases a deep ditch is provided around the base. The chief defect of the tower was its weakness against vertical fire; its masonry was further liable to be cut through by breaching batteries. The French *tours modèles* were somewhat similar to the Martello towers; their chief use was to serve as keeps to unrevetted works. While the Martello tower owes its reputation and its widespread adoption in Great Britain to a single incident of modern warfare, the round masonry structure entered by a door raised high above the base is to be found in many lands, and is one of the earliest types of masonry fortification.

MARTEN, HENRY (1602-1680), English regicide, was the elder son of Sir Henry Marten, and was educated at University College, Oxford. As a public man he first became prominent in 1639 when he refused to contribute to a general loan, and in 1640 he entered parliament as one of the members for



LAND

An installation by Antony Gormley in celebration of Landmark's 50th anniversary

In 2015, Martello Tower is one of five Landmark sites chosen by artist Antony Gormley for an installation called LAND, a collaboration with Landmark in its 50th anniversary year. From May 2015 to May 2016, five different representations of a human figure in cast iron are placed to represent the four compass points - Saddell Bay, Martello Tower, Clavell Tower and SW Point on Lundy, with Lengthsman's Cottage as the fifth, anchoring the whole installation near the centre of Britain, a quiet site on a manmade waterway in marked but complementary contrast with the wide horizons of sea and cliffs at the other four sites.

The Martello work is called CHECK. It was specially created for the site using 3D body scanning techniques, produced in an edition of 5 plus artist's proof.

Landmark's role as Exhibitor of the works was funded by three very generous Landmark supporters who wanted to support this high profile initiative to celebrate Landmark's work across Britain. The cost of fabrication of the five works was funded by the White Cube Gallery, who will sell them on behalf of the artist at the end of the installation year.

Landmark also received a development grant from Arts Council England for scoping and developing this public art work in celebration of our 50th anniversary.

LAND – Artist’s Statement

Antony Gormley

The prospect of making five works for five very distinct locations around the British Isles, to celebrate the 50th anniversary of The Landmark Trust, was an intriguing one. I am always interested in how a work might affect a given environment and possibly add a dimension, a point of focus in a landscape or room. The challenge posed by the Trust's invitation was not simply to offer some form of decoration for the range of historical layers that their buildings embody. The Trust saves buildings that would otherwise disappear and allows us to live within their history. Many of these buildings are detached from their original context of use and social matrix, and are sometimes remote. Some of these buildings were built as follies and towers, made to stand apart, using their isolation as a point of punctuation in the landscape, making a landmark or a point from which to look out at the world at large. This isolation promotes thinking about human history and power relations, and wonder at the very variety of habitats that the human species has created for itself. This being in the world but not exactly of it, through distance in time or isolation in space, is precisely the position that I aspire to occupy in my work. A certain distance is necessary in order for sculpture to encourage or evoke contemplation. It was important to find sites in which the work would not simply become an unnecessary addition, but where it could be a catalyst and take on a richer or deeper engagement with the site.

Each of the five works made for this commission tries to identify a human space in space at large. Where do we live primarily? We live in a body. The body is enclosed by a skin, which is our first limit. Then there is clothing, that intimate architecture of the body that protects us from the inclemency of the weather. But beyond a set of clothes are fixed shelters. We live in a set of rooms. A room coheres into a building and buildings cohere into villages, towns and cities. But, finally, the limit of our bodies is the perceptual limit of the horizon, the edge of a world that moves with us.

In searching for positions to site the five body-form sculptures, I have looked for locations that are not simply conventional places for sculpture (the grotto, the glade, the lawn, the niche or on the axis of an avenues of trees). I have found the most potent places to be where the horizon is clearly visible, and that has often meant the coast. So, I have been drawn to places where the vertical nature of the sculpture can act against the relatively constant horizon of the sea: the promontory on Saddell Beach near Saddell Castle in Argyll; Clavell Tower, the folly on the South Dorset coast; the promontory above Devil's Leap, Lundy; and the Martello tower near Aldeburgh in Suffolk. The work is a register for our experience of our own relative positions in space and time, which has led me to choose positions on the edge; the liminal state of the shoreline.

Of course, all of this relates to our identity. The buildings of The Landmark Trust are detached from their original social function and, mostly, from the city. I think that they connect with the characteristics and psychology of the British as an island people. The British Isles are set somewhat adrift from the great Eurasian continent, with our various associations with the Norse and Scandinavian countries, the Baltic and indeed our friends across the Atlantic. Despite being very aware of our own insularity and separation from the rest of the world, the trading relationships with distant lands - that relationship with the sea, with self and other, with home and the world - has led to water: our identity as an island nation is moulded by our relationship with the sea.

I have selected four coastal sites that are countered by the siting of a fifth body-form that will look down at the water in the lock next to Lengthsman's Cottage in Warwickshire, in the centre of England. The towers and defensive sites on the coastline are here, inland, parried by a state of intimate, domestic exploitation of water as a containable means of transport. I have tried to associate all five works with both their social contexts and the geology of site, using the language of architecture and geology, while acknowledging the skin as a 'weathered edge'. The challenge was to make every work distinct, to allow its verticality to be a focus, as a kind of rod or conductor for thoughts and feelings that might arise at

a site. They are not representations. They are simply displacements, identifying the place where a particular human body once stood and anyone could stand. In that respect they are open spaces, void of ideological or narrative content but waiting for your attention. The works are made of iron: the material that gives this planet its magnetic field, its density, something that maintains it in its particular course through the heavens. Although these works are temporary placements, I would like them to act as catalysts for a reflexive engagement with site: both body and space. In the context of The Landmark Trust's 50th anniversary, it is an occasion to think and feel the nature of our species, its history and future, and its relationship to the huge biodiversity of living beings that exist on the surface of this extraordinary blue planet.