

Under delegation from the Chief Executive, Department of Environment and Science, and under the provisions of s.44 of the *Queensland Heritage Act 1992*, I, Delegated Authority, Catherine Chambers:

Recommend to Not Enter this place in the Queensland Heritage Register as a State Heritage Place



Recommendation Date: 30-Jul-2024

Delegate Name/Position: Delegated Authority, Catherine Chambers



Figure 1: RAN Station 10 Pinkenba (former) (RAN 10), Base Building (Queensland Government, 2024)

No Boundary Map

Figure 2: No Heritage boundary proposed (see attached map)

Place name	RAN 10 (Royal Australian Navy 10)
Address	69 Tingira Street, PINKENBA, 4008
LGA	BRISBANE CITY COUNCIL
RPD	1 RP167498

Queensland Theme(s)

07.06 Maintaining order: Defending the country

Statement of Significance

<p>Criterion A</p> <p>The place is important in demonstrating the evolution or pattern of Queensland's history</p>	<p>The former Royal Australian Navy (RAN) Station 10, Pinkenba (RAN 10), a World War II (WWII) naval mining depot (mining depot), is not important in demonstrating the naval defences of Moreton Bay and the Brisbane River during WWII at a state level of cultural heritage significance.</p> <p>Originally constructed as a mining depot, with buildings later added for a torpedo depot, RAN 10 retains only the substantially altered Base Building (1943) of the mining depot. The removal of the Base Building's mine assembly rails, mine testing tank, northern store room block and most of its southern lean-to shelter, and the loss of the mining depot's quarters and mess building, mine and sinker store and cable store, means that neither RAN 10 nor its Base Building are sufficiently intact to demonstrate its original function as a mining depot.</p> <p>The place does not satisfy this criterion.</p>
<p>Criterion B</p> <p>The place demonstrates rare, uncommon or endangered aspects of Queensland's cultural heritage</p>	<p>The removal of the Base Building's mine assembly rails, mine testing tank, northern store room block and most of its southern lean-to shelter, and the loss of the mining depot's quarters and mess building, mine and sinker store and cable store, means RAN 10 and its Base Building lack intactness and integrity. With neither RAN 10 nor its Base Building sufficiently intact, they do not demonstrate a rare, uncommon or endangered aspect of Queensland's history, being the naval defence of Moreton Bay and the Brisbane River during WWII.</p> <p>The place does not satisfy this criterion.</p>
<p>Criterion C</p> <p>The place has potential to yield information that will contribute to an understanding of Queensland's history</p>	<p>The history and fabric of RAN 10, and that of its Base Building, are well documented; therefore, the place has insufficient potential to contribute new knowledge about Queensland's history; knowledge that will lead to a greater understanding of a particular aspects of Queensland's history; or knowledge that will aid in comparative analysis of similar places.</p> <p>The place does not satisfy this criterion.</p>
<p>Criterion D</p> <p>The place is important in demonstrating the principal characteristics of a particular class of cultural places</p>	<p>RAN 10 does not illustrate the principal characteristics of a WWII naval mining depot in Queensland as it is not intact. Key features specific to the place's operation as a mining depot have been removed over time, including its mine and sinker store and cable store, combined quarters and mess building, boundary fences, and access roads.</p> <p>The last remaining building of the mining depot, the Base Building (1943), is also not intact. Part demolished and altered, it does not retain the characteristic features of its original mine assembly, testing and maintenance functions. Its interior has had its mine assembly rails, mine testing tank and workshop removed. Its storeroom block has been demolished, and the layout of its office</p>

	<p>block has been altered. Most of the long lean-to shelter on the river side of the building, for cleaning mines, sinkers and cables, has been demolished, with its rails also removed.</p> <p>The place does not satisfy this criterion.</p>
<p>Criterion E</p> <p>The place is important because of its aesthetic significance</p>	<p>While the remaining feature of RAN 10, the mining depot's Base Building, displays evocative qualities in its interior, these do not elicit a sufficiently strong response or strongly communicate an aspect of the history of the naval defence of Moreton Bay and Brisbane during WWII, to be of state level cultural heritage significance.</p> <p>The place does not satisfy this criterion.</p>
<p>Criterion F</p> <p>The place is important in demonstrating a high degree of creative or technical achievement at a particular period</p>	<p>RAN 10 did not display any particular artistic, architectural, or creative qualities, or any technical, construction or design qualities to be sufficiently important in demonstrating a high degree of creative or technical achievement at a particular period. With the highly altered Base Building being the only extant component of RAN 10, the place can no longer be important in demonstrating a high degree of creative or technical achievement from the WWII period.</p> <p>The place does not satisfy this criterion.</p>
<p>Criterion G</p> <p>The place has a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons</p>	<p>No evidence was found that RAN 10's highly altered Base Building retains a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.</p> <p>The place does not satisfy this criterion.</p>
<p>Criterion H</p> <p>The place has a special association with the life or work of a particular person, group or organisation of importance in Queensland's history</p>	<p>Although the Royal Australian Navy is an organisation of importance in Queensland's history, RAN 10 was one of many naval facilities constructed in Queensland during WWII. No evidence was found that indicates the remaining Base Building of RAN 10 has a special association with the Royal Australian Navy or the life or work of another particular person, group, or organisation of importance in Queensland's history.</p> <p>The place does not satisfy this criterion.</p>

History

Royal Australian Navy (RAN) Station 10, Pinkenba (RAN 10) was established in January 1943 as a naval mining depot (mining depot). Constructed on the north bank of the Brisbane River at a site which provided deep water access and a pre-existing wharf, the mining depot maintained and reconditioned the loop-controlled naval mines laid in the shipping channels of Moreton Bay from mid-1942. One of ten RAN stations, each with their own function, established on the Brisbane River and the islands of Moreton Bay during World War II (WWII), RAN 10 was also briefly used as a torpedo depot for the British Royal Navy (RN) in late 1945, after buildings were added for this purpose. The last surviving building of RAN 10, the mining depot's timber-framed Base Building (1943), has been altered, including partial demolition, and is vacant in 2024.

Non-indigenous settlers at Pinkenba, within the traditional lands of the Turrbal and Jagera peoples,[1] established farms in the area by the 1860s, and a local school was opened in 1875. By the end of the 19th century, the area included a large abattoir (Queensland Meat Export Company), a rail link and a railway wharf. A government powder magazine was also located at Pinkenba – the locality where ships were required to unload any explosives arriving in Brisbane.[2]

The abattoir site, just downstream from the railway wharf, was acquired in the late 1930s by ACF and Shirley's Fertilisers Ltd, which constructed a new factory for the manufacture of superphosphate and heavy chemicals, and a timber wharf. The works was finished in 1940, but WWII interrupted shipments of raw materials and machinery for the factory.[3]

WWII had commenced in September 1939, and Japan and the United States (US) entered the war in December 1941. The first US armed forces arrived in Brisbane on 22 December 1941, and the city, already the site of a RAN depot at the southwest end of Alice Street and naval stores at Kangaroo Point [QHR 600239], soon became a major supply base and staging point for the war against Japan in the South West Pacific. The arrival at New Farm in mid-April 1942 of US Navy submarines and their tender ship USS *Griffin*, made Brisbane the largest US naval base in continental Australia.[4]

Controlled Mining

The US submarine strike force and other shipping in Brisbane and Moreton Bay needed protection from attacks by enemy submarines.[5] One method for defending Australian ports was laying naval (sea, or submarine) mines – either independently detonated or manually detonated from a shore station. The latter type, or 'controlled' mines, were safer for friendly vessels, and were operated either through observation (detonating the mines when an enemy vessel was seen crossing a line of mines) or loop-detection (detonating when an indicator loop detected an enemy vessel crossing).[6]

Observation mines were used for the defence of Brisbane from the 1880s to the 1900s. When Fort Lytton [QHR 600248] was established near the mouth of the Brisbane River in the early 1880s, its gun defences could be supplemented by lines of mines laid in the river, which could be electrically detonated from the fort if an enemy vessel crossed the lines of mines. These mines were based at Fort Lytton until 1908.[7]

In contrast, the minefields laid in Moreton Bay from mid-1942 were loop-controlled, and the only minefields of this type laid in Australia during WWII.[8] An indicator loop relied on the production of an induced current in a stationary loop of wire when a magnet moved overhead. Even if wiped or degaussed (to reduce or eliminate their magnetic field), submarines had sufficient magnetism to produce a small current in a loop, which registered as a 'swing' on a galvanometer in a shore station connected by cable to the indicator loop. If no ship was visible on the water, the detected vessel had to be a submarine, and a vessel

was despatched to drop depth charges.[9]

Alternatively, if indicator loops were used with a loop-controlled minefield, in which mines were connected by cable to a mine control hut on shore, the mines could be detonated if a submerged submarine was detected (as friendly submarines always entered port surfaced). Loop-controlled mines were accompanied by 'guard' loops laid in front of the minefield. When a submarine was detected by the guard loop, the operator would wait until there was also a swing on the mine loop (laid immediately around a group of mines) and then the appropriate mines would be detonated by sending a current down the mine loop.[10]

The evolution of RAN mining policy, WWII

The laying of naval mines in Queensland waters during WWII was a result of shifting priorities and strategy. By August 1941, prior to Japan's entry into the war, Australia's priorities for defensive observation minefields (for anti-invasion purposes) included Bynoe Harbour (Darwin); in the South (or Rous) Channel between Moreton Island and North Stradbroke Island, Moreton Bay; and Port Stephens, Broken Bay, and Botany Bay in New South Wales.[11] Australia did not possess any controlled mines at this stage, but experiments in assembling improvised controlled mines were approved at the Torpedo School of the Flinders Naval Depot (now HMAS *Cerberus*) in Victoria.[12]

After the attack on Sydney Harbour by Japanese 'midget' submarines on the night of 31 May-1 June 1942, the purpose of Australia's observation minefields became anti-submarine. Observation minefields were soon established at Newcastle, Townsville and Cairns. By the end of 1942, observation minefields were also completed at Port Stephens, Broken Bay and Botany Bay, while the remainder were cancelled.[13] The improvised observation minefields at Townsville and Cairns, both completed by 4 August 1942 and designed to defend against midget submarine attacks, did not last long enough to require mining depots, as both were removed in 1943.[14]

Defending Moreton Bay in WWII

Moreton Bay required anti-submarine defences due to its role as a naval base. A June 1942 memorandum from the Department of the Navy to the Secretary, Department of the Army, stated: 'At the request of the Commander, Allied Naval Forces, Southwest Pacific Area, Moreton Bay is to be developed as a Naval Operating base as a project of high priority'.[15]

The major shipping route into Moreton Bay was the Northwest Channel, which ran from the north near Caloundra in a southeast direction off the east coast of Bribie Island. From near Moreton Island, several channels (Pearl, Main and East) then ran southwest towards the mouth of the Brisbane River. By June 1942 a loop-controlled minefield had been laid in the Northwest Channel and more were being laid in the Pearl and Main channels off Cowan Cowan, on the west side of Moreton Island. Indicator loops would also be laid from near Skirmish Point on Bribie Island to Comboyuro Point on Moreton Island, with Harbour Defence Asdics (HDAs), sonar domes mounted on tripods sitting on the seabed, placed south of the indicator loops. The indicator loops and HDAs would be controlled from RAN 4 at Woorim [QHR 601143], Bribie Island, and RAN 7 at Bulwer, Moreton Island, which controlled one of the HDAs. An anti-submarine obstruction was planned for Rous Channel, but never completed.[16]

The loop-controlled minefields (Stations 57 and 67) laid in Moreton Bay in mid-1942 were originally intended for Hobart. [17] Each of the stations contained eight mine loops, each loop with 16 mines, for a total of 128 mines per station. The minefield in the Northwest Channel off Bribie Island (Station 67) was laid during Operation Duncan by HMS *Atreus* (the base ship) and HMS *A/sey* (the laying vessel), between 19 and 29 May 1942, and included two guard loops. Station 67 was controlled by RAN 2, a controlled mining station near Fort Bribie [QHR 601143] at the northern end of Bribie Island, which included underground

concrete control and power huts, as well as a nearby observation post to visually determine if any loop 'swing' had been caused by a surface vessel. Friendly vessels were expected to report their presence to RAN 1, the Port War Signal Station (PWSS, which identified approaching ships as friend or foe), at Caloundra (Wickham Point), before proceeding into the Northwest Channel. In late 1943, the mines of Station 67 were lifted and moved (in Operation Harry) to the East Channel off Tangalooma on Moreton Island, as there was a risk of friendly vessels approaching the minefield in the Northwest Channel before they had been identified by the PWSS. The new controlled mining station at Tangalooma was also designated as RAN 2.[18]

Between 9 and 20 June 1942, during Operation Edward, HMS *Atreus* and HMS *Aisey* laid Station 57, to be controlled from RAN 3 south of Fort Cowan Cowan [QHR 602559]. As Station 57 was laid as two separate minefields in the Pearl and Main channels, it included four guard loops. The British L Mark (Mk.) II mines used in Moreton Bay were either moored above the sinker to which they were attached or, in shallower water, sat on top of their sinker as 'ground' mines.[19] Station 67 was in operation from 12 June 1942, and Station 57 from 7 July 1942.[20]

As well as the RAN stations already mentioned, the remainder of the 10 RAN stations constructed to defend Moreton Bay and the Brisbane River during WWII, each with their own function, included RAN 5, established in August 1942 at the Combined (Operations) Training Centre (amphibious warfare) at Toorbul Point (now known as Sandstone Point), and RAN 6, an advanced Fairmile (anti-submarine motor launch) base at Bongaree, Bribie Island.[21]

On the Brisbane River, RAN 8 was a boom defence facility, an anti-submarine boom across the Brisbane River between Fort Lytton and Bulwer Island – operational with a single gate from November 1942, and double gates from July 1943, the gates being operated by HMAS *Kinchela*. RAN 9 [QHR 602448] was an indicator loop and photo-electric (PE) beam station at Myrtle town, with the PE beam (a light beam which triggered an alarm when it was broken by an object) operational by September 1943, and the indicator loop by January 1944.[22]

In addition to the 10 RAN stations, a degaussing range was operational at Lytton from December 1942, and a boom defence depot, constructed in Pinkenba upstream from RAN 10, was operational in August 1943. Minesweeping Group 74, made up of auxiliary minesweepers (requisitioned civilian vessels), was also based at Brisbane.[23]

Construction of mining depot at RAN 10, Pinkenba

The mines, sinkers and cables of Stations 57 and 67 needed to be periodically raised, repaired, and cleaned before relaying, and this required a mining depot. Initially, the plan in May 1942 was to have an inland mining depot, to store both the mines and their explosive charges, with a separate issuing depot located near a wharf, but this was soon modified to have the mining depot at Pinkenba, with only the explosive components stores inland.[24]

At this time Australia possessed a mining depot at Swan Island, located near the entrance to Port Phillip Bay, Victoria. Early controlled mining had been conducted from a section of the 19th century Swan Island Fort, and WWI-era independent mines were stored on Swan Island from c1920 until the early 1930s. Swan Island was again used as a mining depot during WWII, when the depot was expanded to store Mk.XIV independent mines, manufactured in Australia and destined to be laid in defensive minefields around New Guinea. By 1941 it included jetties, separate storage sheds/magazines for components of mines and explosives, (mine) examination rooms, naval stores, workshops, and accommodation buildings, contained within a secure fence line. A network of tramlines across the island connected key buildings to each other and the jetties.[25] US Navy mining depots were also built in Brisbane (Mount Coot-Tha) [QHR 602446] and Darwin, in the Northern Territory. These facilities, for independent naval mines, included storage buildings,

magazines, mine assembly buildings and personnel accommodation, contained within secure compounds.[26]

Standard plans for a mining depot were drawn on 9 February 1942 and supplied by the Director of Ordnance, Torpedos and Mines (DOTM) to the District Naval Officer in Brisbane in June 1942. These plans, for a 'Controlled Mining Base' (plan CM95) and a 'Mining Shed' (plan CM96), envisaged that the mining depot at RAN 10 would comprise a complex similar to the mining depot at Swan Island, with mine and primer magazines, an examination room, a large mining shed with a verandah, and a jetty, all connected by tramways. Central to the complex was to be the 'Mining Shed', a building with a large central space containing workshops, work benches, offices, store rooms, a locker room and a test tank, plus two sets of assembly rails, two overhead cranes, and tramlines inside the shed.[27]

However, these standard plans were not adopted at RAN 10. In early June 1942, Captain John D Campbell, RN, of HMS *Atreus* proposed a mining depot at Pinkenba with a Base Building, a mine case and sinker store, and a cable store. This facility could receive controlled naval mines (type L Mk.II) at ACF and Shirley's wharf and remove their 500lb (227kg) explosive charges for transport to the Naval Explosives Area reserved for the RAN at the US ammunition depot at Darra. The empty mine cases, their sinkers and loop cables would be stored, maintained and readied for laying at the Pinkenba mining depot. When required, the mine charges, plus primers and detonators, would be trucked back to Pinkenba, where the mines would be reassembled in the Base Building for deployment in Moreton Bay. [28] A mine case and sinker store (with space for 48 empty L Mk.II mine cases and their sinkers) was later constructed under the south end of the ACF and Shirley's Acid factory building, while the cable store – a 30ft by 20ft (9m by 6m) enclosed timber shed – was constructed on the upstream end of the wharf.[29]

Campbell dismissed the standard plans supplied by the DOTM as overly complex, believing his own proposals would suffice. Instead of the mines and sinkers being moved around the mining depot by tramway, as proposed in plan CM95, a 2-ton mobile crane, based on a truck chassis, would retrieve the mines and sinkers from under the Acid factory building and deliver them to the Base Building. The mines would then have their charges added and be attached to their sinkers using the assembly rails. Each combined mine/sinker unit would then be pressure tested in the testing tank inside the Base Building, and the mobile crane would transport the combined units (about 1.5 tons each) to the laying vessel at the wharf.[30]

Campbell also preferred his own plans for a Base Building to the more extensive Mining Shed proposed in CM96. In early June he sketched a 'mining base' building of 85ft by 26ft (26m by 8m). His requirements for such a building included a concrete floor; adequate natural lighting; room for assembly rails that could handle a loop of 16 mines and their sinkers; work benches; a testing tank; plus an office, men's locker room, toilets, store rooms and a workshop. It also had to be tall enough for an overhead, manually operated 2-ton travelling crane on rails – for moving the mines and sinkers inside the building. The height and width of the main door to the Base Building had to allow the mobile crane to move in and out, carrying the combined units clear of the ground. [31]

A plan for the Base Building was drawn 30 June 1942 by the Works Director (Works and Services Branch, Queensland, Department of the Interior), likely influenced by Campbell's earlier sketch. It was for a timber-framed building with a double-height, gable-roofed rectangular main wing, 86ft (26m) in length, and two single-height attached blocks with skillion roofs.[32]

In October that year, drawings show the planned length of the main wing had been increased to 100ft (30.5m). The main wing, which was 19ft (5.8m) wide, was for the assembly, servicing, and testing of mines, and contained a set of assembly rails, two work

benches at the east end, and a testing tank and a small workshop enclosure at the west end, with an overhead 2-ton travelling crane. On both its long sides, the main wing had 10 sets of high-set fixed sash windows above low-set colonial hung sash windows. Large sliding doors were located at the east end of the main wing, with a smaller set of sliding doors on the north side. Attached to the northern, long side of the main wing were two skillion-roofed blocks, one at either end. The larger, western block accommodated storerooms for equipment, and the smaller, eastern block accommodated an office, men's lockers and toilets. The Base Building was clad with asbestos cement wall sheeting, with asbestos cement roofing.[33]

The Base Building was also provided with black-out devices for its windows. This allowed work to continue in a succession of 'watches' 24 hours a day, without making the Base Building a well-lit target for enemy aircraft. They consisted of window sashes, containing blackout fabric, which could be raised inside their window frames to screen the interior of the glass window panes above them.

Funding approval for the mining depot at Pinkenba was sought in early August 1942, as 'An urgent necessity has now arisen for the establishment of a Controlled Mining Base at Brisbane... for the receipt, storage and general handling of mines and equipment associated with the Minefields'.[34] Funding was approved by the War Cabinet on 12 August 1942, and the Base Building was completed on 5 January 1943.[35]

Begun in February 1943 and completed at the end of June that year, a RAN personnel quarters and mess building was added to the mining depot complex, just northwest of the Base Building. A 6ft (1.8m) barbed wire fence was erected around both buildings.[36]

In late 1943 the Base Building was altered. A lean-to shelter with a concrete floor and a set of rails was added alongside the south side of the main wing, in order to provide shelter for naval personnel occupied in stripping, cleaning, painting and reassembling mines, sinkers and cables. A 5-ton crane, originally specified for the wharf but then deferred, was also delivered (from the Mackay Harbour Board) in late 1943. It proved unsuitable and was soon dismantled.[37]

RAN 10's mining depot in operation

Despite the delay with the quarters and mess building, RAN 10 was operational as a mining depot by early January 1943.[38] HMAS *Uralba*, a controlled minefield tender, operated from RAN 10. This vessel recovered and replaced a mine loop from Station 57 in January-February 1943, and recovered and re-laid faulty guard and mine loops at RAN 3 in May-June 1943. RAN 10 also supported the transfer of RAN 2 and its related minefield from Bribie Island to Moreton Island in late 1943. HMAS *Uralba* and HMAS *Bermagui* (the second controlled minefield tender assigned to RAN 10) reconditioned the minefields in Moreton Bay between January and March 1944, and several mine loops were raised and repositioned. Between April and June 1944, RAN 10 was occupied with general maintenance, plus experiments in 'balancing' the loops at Tangalooma; while five mine loops were laid in Operation Edward 2.[39]

By late 1944, due to the 'improvement in the war situation', controlled mining at Brisbane was no longer deemed necessary. The two controlled mining stations at RAN 2 and RAN 3 on Moreton Island were closed, and HMAS *Bermagui* commenced recovery of the controlled minefields on 4 August that year. The indicator loops between RAN 4 and RAN 7 also ceased operation in early August 1944. By the end of September 1944, 240 mine units and 'many miles of cable' had been retrieved for reconditioning at RAN 10. Recovery work by HMAS *Bermagui* continued during the October-December quarter of 1944. By the end of March 1945, it was reported that all 'mines, C.M., Armament and Naval Stores have been dispatched to the original source of supply, in preparation for closing down [RAN 10]'. Six units of the minefields were still to be recovered at this time, but they were reported as

retrieved by the end of June 1945. [40]

RAN 10's torpedo depot

A torpedo depot was also constructed at RAN 10 in late 1943 for the British Navy, although it was not fully completed, or used, until mid-1945. A torpedo workshop and compressor building were erected northeast of the existing mining depot buildings, while a dispersed torpedo stowage building was sited elsewhere, although the exact site is unknown.[41]

By February 1945, RAN 10 was being considered for the storage and maintenance of Mk.IX torpedos, used by cruisers and destroyers of the British Pacific Fleet, which arrived in Australia in late 1944-early 1945.[42] In April 1945 plans were made to convert the Base Building at RAN 10 to torpedo storage, as the mining depot was due to cease work. This would have required removing the Base Building's assembly rails, work benches, workshop and testing tank, and installing storage racks for 50 torpedos, but it is not known if this conversion occurred. When a number of Mk.IX torpedos and their warheads were deposited at the torpedo depot in June 1945, it was reported that the torpedos were being stored in the torpedo workshop, while the warheads were being stored in the open. A British naval unit, (ABTU) No.2, arrived at RAN 10 on 28 July 1945, shortly before the war ended on 2 September 1945.[43]

RAN 10 post-war to 2024

The five wartime buildings constructed at RAN 10 for the mining depot and the torpedo depot were initially retained by the ACF and Shirley's fertiliser works, which reopened on the site in October 1946.[44] However, all but the Base Building of the mining depot were later demolished. The torpedo workshop and the compressor building of the torpedo depot were demolished by 1951. The mining depot's quarters and mess building was half demolished by 1951 and fully demolished by 1985. The mining depot's cable store building on the wharf was demolished by 1960. By 1991, most of the Base Building's added lean-to shelter along the south side of the main wing had been removed, retaining a section of it at its eastern end. The Base Building's store room block was demolished by 1998. New buildings were erected just southeast of the Base Building by the 1960s.[45]

In 2022, the fertiliser works' site was purchased by SIMS Group Australia Holdings Ltd to store scrap metal prior to its export.[46]

In 2024, of the complex of purpose-built buildings of RAN 10, only the Base Building survives on the site, partially demolished, altered, and unused. Elsewhere in Brisbane and Moreton Bay, concrete buildings and/or concrete slabs survive at RAN 2 (Bribie Island), 3, 4, 6, 7, 8 and 9.[47]

Description

Royal Australian Navy (RAN) Station 10, Pinkenba (former) (RAN 10) (1943) comprises a single building, a remnant of a purpose-built naval mining depot complex. Located on the northern bank of the Brisbane River, 7km upstream from its mouth, the surrounding area is largely industrial. The remaining Base Building is sited within a large property accessed from the north by Tingira Street, which contains many industrial structures, and open spaces. The Base Building (1943) is a timber-framed, single-storey, slab-on-ground building standing approximately 30m from the river edge. It is immediately abutted on its southern side by a later building, standing between it and the river and wharf.

The Base Building comprises a tall, rectangular main wing with a gable roof (its long side

parallel to the river) with a smaller attached skillion-roofed block on its northern side (at the eastern end) and a remnant section of a partially demolished lean-to, skillion-roofed shelter on the main wing's southern side. A second, attached block on the western end of its northern side, which accommodated storerooms, has been demolished. The building's roofs are clad in corrugated fibre cement sheets and its external walls are all clad in fibre cement sheets.

Internally, the main wing comprises one large double height space. Its floor is a concrete slab with upstands on the perimeter forming the bottom section of its walls. Poured in-situ, these upstands have chamfered corners, differentiating them from later concrete additions. The interior is unlined, and its timber wall and roof framing is exposed. The buildings' structure consists of timber portal frames of trussed columns and triangular roof trusses, regularly spaced along the length of the building. A hand operated gantry crane and its metal rails are retained atop the columns. Between the portal frames, the wall framing retains openings for high- and low-level windows, however, most windows have been removed and all have been externally clad over. Most upper windows retain a separate blackout sash. The original large sliding doors on the east end of the building, the main door for receiving and despatching mines, has been removed and replaced with a modern roller door. Other external doors have been removed and their openings clad over or replaced with a modern roller door (north). The main space originally contained mine assembly rails along the southern side, and a mine testing tank and workshop at the northwest corner; these have all been removed. A small service cupboard with concrete base has been added at the southeast corner of the room.

The attached block, originally accommodating an office, and staff lockers and toilets, is accessed from within the main wing. Internally, some of its original flat sheet-lined partitions have been demolished and new partitions added to reconfigure the layout into a storeroom and separate bathroom, and an external door has been cut into its east side.

The remnant section of the former lean-to shelter on the main wing's southern side has a concrete floor and is open-sided. Its original rails have been removed and timber posts have been added.

Original features of the Base Building are:

- double height main wing with gable roof, single-height northern block with skillion roof, and the remaining portion of the southern lean-to shelter with skillion roof
- flat fibre cement sheet wall cladding with timber cover battens, and corrugated fibre cement roof sheets
- metal roof vents
- construction: concrete slab-on-ground floor with concrete upstands with chamfered corners, and timber portal frames with metal plates
- high- and low-level window openings, regularly spaced along north and south sides of main wing, original fixed windows on northern side, and upper-level blackout sashes
- single, large internal volume of main wing
- hand-operated travelling gantry crane and its metal rails
- north block's original glass louvre window and original sections of timber-framed partition (between former office and former lockers and toilets).

Non-original features of the Base Building are:

- fibre-cement sheet and timber battens over original window and door openings
- roller doors and timber board door in western end

- service cupboard in main wing, including its concrete upstand base and timber framed and clad walls
- added windows, partitions, and doors in northern block and its bathroom fit out.

Illustrations



Figure 3: Base Building, eastern end (Queensland Government, 2024)



Figure 4: Base Building, eastern end with wharf in far background (Queensland Government, 2024)



Figure 5: Northern side of Base Building (Queensland Government, 2024)



Figure 6: Southern side of Base Building (Queensland Government, 2024)



Figure 7: Interior of Base Building looking west (Queensland Government, 2024)



Figure 8: Original fixed window with blackout sash (Queensland Government, 2024)



Figure 9: Two ton gantry crane at west end of Base Building (Queensland Government, 2024)



Figure 10: Bathroom in office block of Base Building (Queensland Government, 2024)

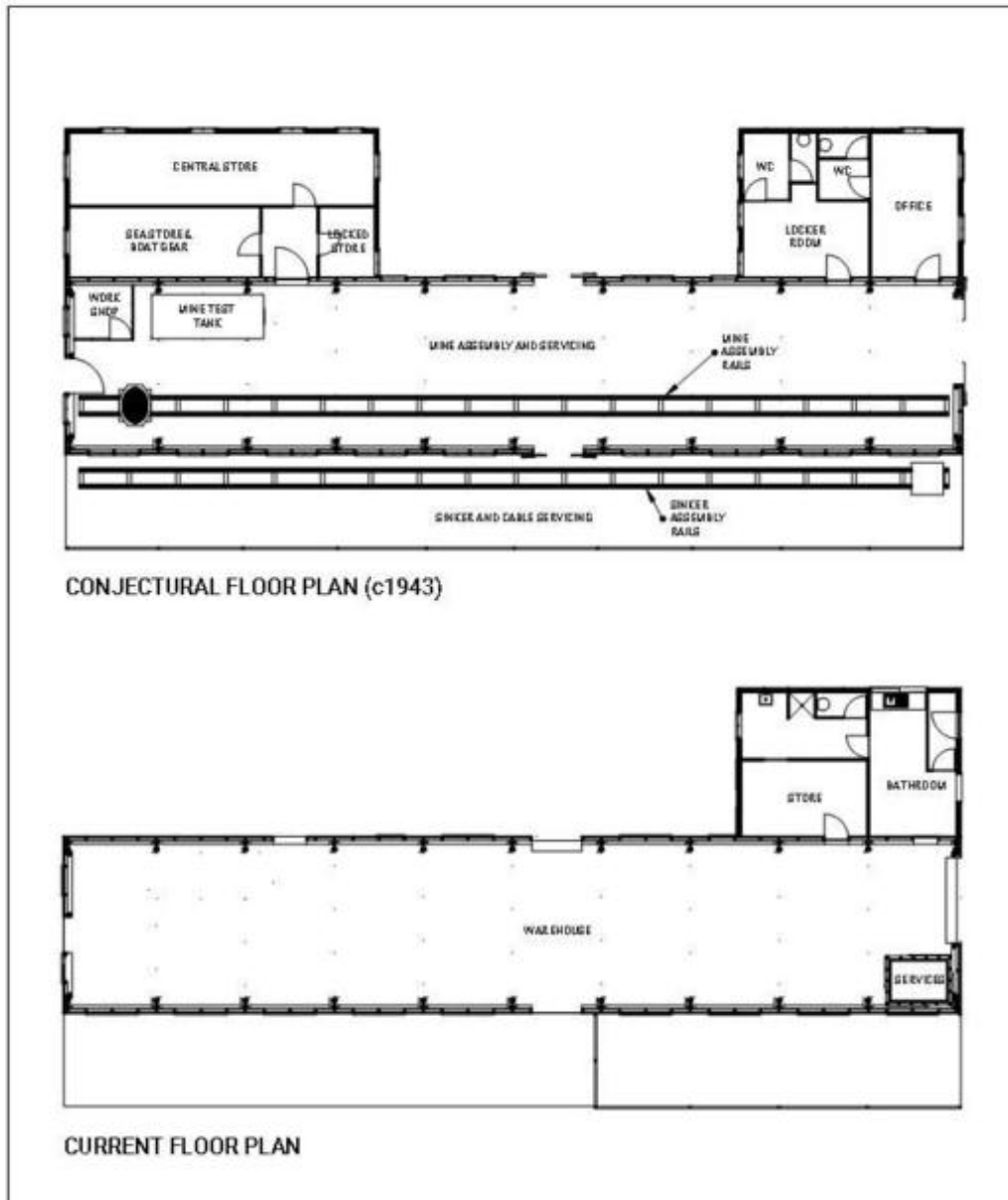


Figure 11: Former locker room in office block of Base Building (Queensland Government, 2024)



Figure 12: Former office in office block of Base Building (Queensland Government, 2024)

Plans



**RAN Station 10, Pinkenba
650283
Base Building Floor Plans**

Date created: 16/07/2024
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Figure 13: Conjectural and Current Floor Plan (Queensland Government, 2024)

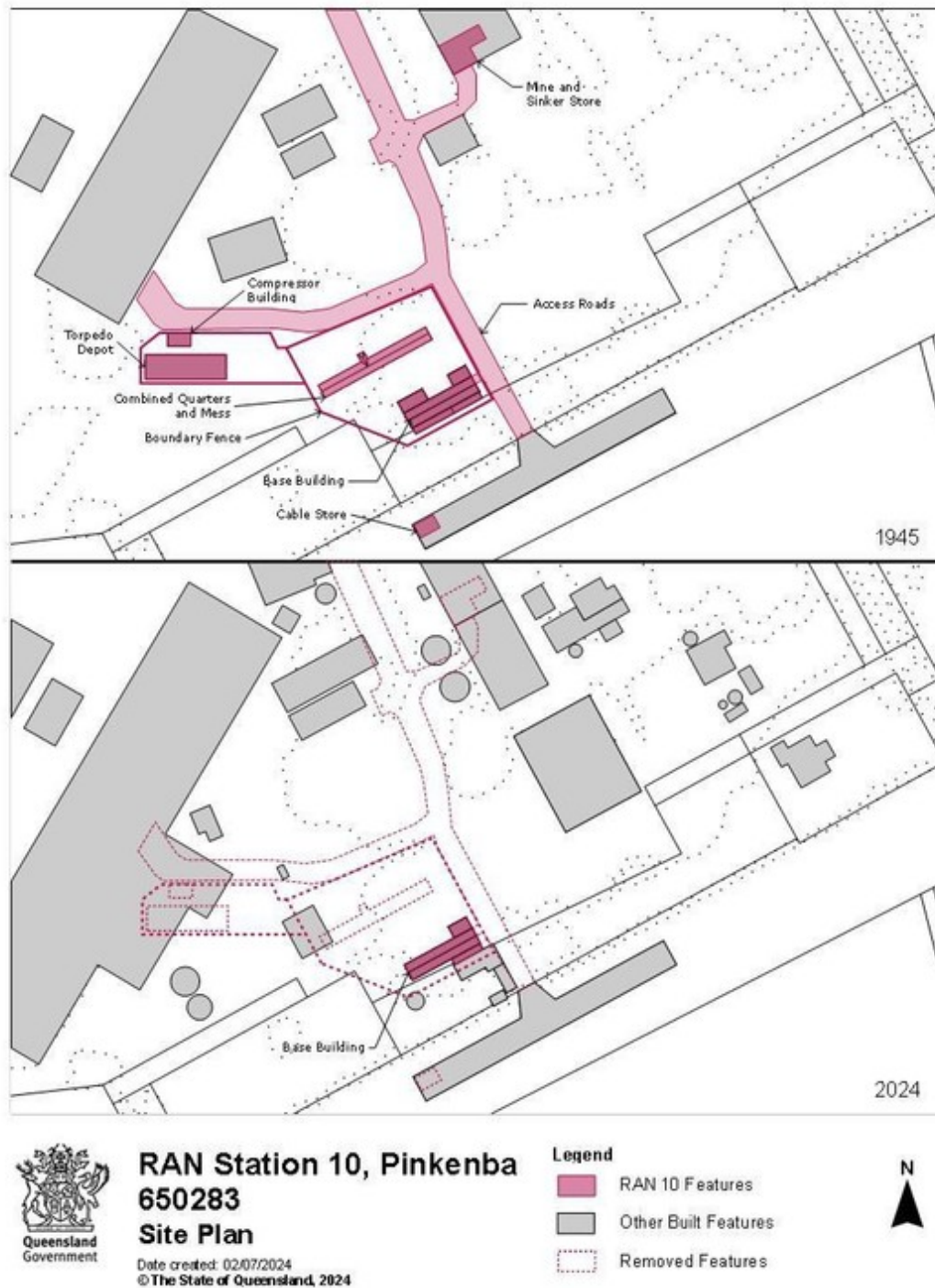


Figure 14: Site plan of RAN Station 10, Pinkenba in 1946 and 2024 (Queensland Government, 2024)

Proposed heritage register boundary

No heritage boundary proposed

References

[1] Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships, Cultural heritage Database and Register, Public Map, <https://culturalheritage.datsip.qld.gov.au/achris/public/public-registry/home>, (accessed 10 June 2024).

[2] QHR 602453, 'Pinkenba War Memorial'; 'Government Railway Policy', *The Queenslander*, 13 November 1897, p.925; Queensland State Archives, Agency A5627, 'Pinkenba State School'; 'Pinkenba Powder. A source of danger due to divided authority', *Truth*, 17 March 1907, p.7. In 1907, most explosives arriving in Queensland were unloaded, by lighter, at Pinkenba, and most of these explosives were then railed to a magazine at Dakabin. Even after WWII, port regulations still required ships to unload any explosives or ammunition at Pinkenba before continuing further up river ('Must unload and reload', *The Telegraph*, 26 August 1947, p.9).

[3] 'Superphosphate manufacture, ACF new works at Pinkenba', *Courier Mail*, 4 November 1938, p.6; 'New enterprise by ACF Fertilisers Ltd. Heavy chemical works in Queensland', *Nambour Chronicle and North Coast Advertiser*, 11 November 1938, p.10; 'Phosphate Works at Pinkenba ready next year', *Courier Mail*, 16 March 1939, p.4; 'ACF & Shirley's guard against supply shortage, profit down', *Telegraph*, 13 May 1941, p.13. The Japanese capture of the island of Nauru in 1942 was a major blow to Australia's fertiliser production, as the island was a major source of phosphate rock (formed from seabird guano).

[4] QHR 650230, 'Heavy Anti-Aircraft Gun Station 385, Lytton'; NAA Item 657126, 'Reports of Proceedings, HMA Ships and Establishments] RAN Administrative Authority - District Naval Officer / NOIC [Naval Officer in Charge] / Brisbane Command (HMAS "Brisbane"); Queensland WWII Historic Places, 'United States Navy (USN) Submarine Base and Repair Unit', <https://www.ww2places.qld.gov.au/place?id=1006> (accessed 4 June 2024). The US's Pensacola Convoy, which arrived in Brisbane on 22 December 1941, had been diverted from its route to the Philippines. The naval depot at Alice Street was commissioned as HMAS *Penguin IV* in September 1939, renamed HMAS *Brisbane* in 1940, and then HMAS *Moreton* in October 1942. A large naval victualling store, constructed at the northeast end of Merthyr Road in New Farm in 1944, became the site of HMAS *Moreton* in 1960 (Naval Historical Society of Australia, 'HMAS Moreton and Brisbane Naval Depots', <https://navyhistory.au/hmas-moreton-and-brisbane-naval-depots/> (accessed 18 June 2024); Queensland WWII Historic Places, 'RAN Recruiting Depot and victualling store (HMAS Moreton)', <https://www.ww2places.qld.gov.au/place?id=1017> (accessed 18 June 2024)). Two naval store buildings were constructed at Kangaroo Point, in the late 1880s (QHR 600239 'Naval Stores (former)').

[5] Defence against surface warships was provided by the existing coastal artillery defences of Moreton Bay, which included: Fort Lytton [QHR 600248], established in the late 19th century on the southern side of the Brisbane River's mouth; Fort Bribie [QHR 601143], established in 1939 at the northeast tip of Bribie Island; and Fort Cowan Cowan [QHR 602559], established in the late 1930s on the west side of Moreton Island.

[6] Naval Historical Society of Australia 'RAN controlled minefields in World War 2', <https://navyhistory.au/ran-controlled-minefields-in-world-war-2/> (accessed 7 February 2024).

[7] QHR 600248 'Fort Lytton'; DW Spethman and RG Miller, *Fortress Brisbane, a guide to historic fixed defence sites of Brisbane and the Moreton Bay Islands*, Brisbane, Queensland, the Author, 1998, pp. 4, 7. The full complement of mines never had to be laid, but test firings were conducted over the years, with varying degrees of success ('The Lytton Camp',

Queensland Times, Ipswich Herald and General Advertiser, 27 March 1883, p.3; 'Lytton', *Queenslander*, 19 April 1884, p.612)

[8] M Turner and H Donohue, *Australian Minesweepers at War: Minewarfare Operations by the Royal Australian Navy During the Two World Wars*, Canberra, ACT, Sea Power Centre, 2018, p.88. The minefield at Newcastle was apparently an 'ad hoc controlled minefield' – neither an observation, nor a standard loop-controlled minefield (Naval Historical Society of Australia 'RAN controlled minefields in World War 2'). In April 1943, Newcastle was listed as being defended by an observation minefield and indicator loop (NAA Item 398198, 'Review of local naval defences in Australian Waters', 1943-44).

[9] QHR 602448 'RAN Station 9, Pinkenba (Myrtletown)'; Naval Historical Society of Australia 'RAN controlled minefields in World War 2'; National Archives of Australia, Item 398574 'Controlled Minefield Moreton Bay (Operation Duncan)', 1942. The small current generated in the loop by a submarine's passing deflected the galvanometer, and this deflection was amplified by a small lamp shining on the galvanometer's mirror, which produced a spot of light on a screen which moved first one way, then the other – hence a 'swing'.

[10] QHR 602448 'RAN Station 9, Pinkenba (Myrtletown)'; Naval Historical Society of Australia 'RAN controlled minefields in World War 2'; NAA Item 398574.

[11] NAA Item 471349, 'Observation Minefield – Cairns (operation 'Ruby') – General File', 1941-49; NAA Item 961932, 'Controlled and Observation Minefields', 1942-44. The idea of an observation minefield in Rous channel was abandoned as the District Naval Officer in Queensland believed the Rous Channel was an un-navigable entrance to Moreton Bay (History provided by Applicant).

[12] NAA Item 471349; NAA Item 961932; Naval Historical Society of Australia 'RAN controlled minefields in World War 2'. Improvised mines could be constructed by concreting mine charges into the timber boxes in which they were delivered, and laying the boxes on the bottom of shallow channels with cables attached so they could be detonated from a shore control station. The experiments at Flinders Naval Depot were completed in January 1942 and the laying of 20 observation minefields was approved in March 1942, although this number was later revised downwards.

[13] NAA Item 961932; NAA Item 471349; Naval Historical Society of Australia 'RAN controlled minefields in World War 2'. The minefield at Port Stephens is listed as 'in abeyance' by April 1943 (NAA Item 398198).

[14] NAA Item 961932; NAA Item 471349; NAA Item 5944816, 'Observation minefield - Townsville', 1942-43; Naval Historical Society of Australia 'RAN controlled minefields in World War 2'. In standing orders for OMS (Observation Mining Station?) Pearl, 22 August 1942, regarding a suspected attack by midget submarines, it was noted that the OOD (Officer of the Day) must not hesitate to act, as 'It is far better to blow up an innocent object, such as floating boxes, porpoises, etc, than let an enemy submarine through' (NAA Item 5944816). The Townsville and Cairns minefields were both to be replaced by an anti-torpedo/anti-boat boom, Type 135 Detector units (Harbour Defence Asdics, or HDAs) plus hydrophones (NAA Item 398198).

[15] NAA Item 3081400, 'RAAF Command Headquarters – South West Pacific Area - Fixed defences of Moreton Bay', 1942. In April 1943 it was noted that the Brisbane River functioned as an operational base for task forces, submarines and escort craft, and a debarkation and expeditionary port for the Army; with Moreton Bay acting as a convoy assembly port and protected exercise area, and a refuelling point for larger ships (NAA Item 398198).

[16] NAA Item 3081400; NAA Item 398198; NAA Item 476223, 'Moreton Bay Queensland seaward defences', 1942-44; Spethman and Miller, *Fortress Brisbane*, pp.21, 23, 35; 'Indicator loops and harbour defences of the Royal Australian Navy in Moreton Bay', http://indicatorloops.com/moreton_bay.htm (accessed 7 February 2024); 'Indicator Loops

and Harbour Defence Asdics (HDAs)', <http://indicatorloops.com/hda.htm> (accessed 8 March 2024). Four indicator loops and three HDAs were laid between RAN 4 and RAN 7 by HMAS *Bangalow* in late 1942. The indicator loops commenced operation on 28 January 1943, and two of the HDA's by 28 June 1943. RAN 7 and HDA 'A' were operational by 15 November 1943 (NAA Item 657126). The anti-submarine barrier for Rous Channel, from Sandy Point to Amity Point, constructed with timber 'dolphins' (piles) and steel netting, was started in early 1943 but was never completed (NAA Item 657126; Spethman and Miller, *Fortress Brisbane*, pp.36-7). Two new coastal defence batteries were also planned (Skirmish battery, constructed at Woorim in 1942 [QHR 601143], and Rous Battery, on the east side of Moreton Island, constructed in 1943). These were each armed with two US-supplied 155mm field guns, on concrete Panama (circular) mounts.

[17] In January 1942 Australia had agreed to a December 1941 British request to allow the British Eastern Fleet to operate from Australian bases. By March 1942 intended bases included Sydney, Fremantle, Hobart and Darwin, which would require naval defences – but the minefields planned for Sydney, Darwin and Hobart were soon cancelled. (NAA Item 7593957, 'War Cabinet Agendum - No 165/1942 and supplement 1 - Development of fleet bases in Australia', 1942; NAA Item 679214, 'Controlled mine fields Bas[e] at Pinkenba Q'land. War Cabinet Agendum No.331/1942'; Naval Historical Society of Australia 'RAN controlled minefields in World War 2').

[18] NAA Item 398574; NAA Item 398198; NAA Item 657126; Naval Historical Society of Australia 'RAN controlled minefields in World War 2'; Spethman and Miller, *Fortress Brisbane*, pp.13-14, 17, 21, 23, 35-36; 'Indicator loops and harbour defences of the Royal Australian Navy in Moreton Bay'. The PWSS was located at Cowan Cowan [QHR 601097] prior to moving to Caloundra from 26 March 1942, and a concrete PWSS tower was completed at Wickham Point in early 1943. The controlled minefield in the Northwest Channel was intended primarily for submarines but could be used for larger surface combatants 'if it is evident that the shore defences [coastal batteries] cannot cope with them' (NAA Item 398574).

[19] NAA Item 398574; Turner and Donohue, *Australian Minesweepers at War*, p.89; Naval Historical Society of Australia 'RAN controlled minefields in World War 2'; NAA Item 398198; NAA Item 657126; Spethman and Miller, *Fortress Brisbane*, pp.13-14, 17, 21, 23, 35-36; 'Indicator loops and harbour defences of the Royal Australian Navy in Moreton Bay'. Basing the controlled mining stations RAN 2 and RAN 3 near the coastal batteries at Fort Bribie and Fort Cowan Cowan had the advantage of providing Army protection for the RAN stations (History provided by Applicant). The mines laid in Operation Duncan were ground mines, whereas Operation Edward laid them as both moored and ground mines. After Operation Edward it was reported by the Commanding Officer of HMS *Atreus*, Captain John D Campbell, RN, that a total of 16 mine loops and six guard loops had been laid over 40 days (during Operations Duncan and Edward). In August 1942 the Moreton Bay loop controlled minefields were designated as Northwest Channel (CM. No.1); Pearl Channel (CM. No.2); and Main Channel (CM. No.3).

[20] NAA Item 657126.

[21] NAA Item 657126; Spethman and Miller, *Fortress Brisbane*, pp.21, 23, 47; 'Indicator loops and harbour defences of the Royal Australian Navy in Moreton Bay'; Queensland WWII Historic Places, 'Combined (Operations) Training Centre, Toorbul Point', <https://www.ww2places.qld.gov.au/place?id=1373> (accessed 7 June 2024). RAN 5 was handed over to the Americans in May 1943. RAN 6 included three fuel tanks and two concrete magazines, built between late 1942 and late 1943 (NAA Item 657126). A Fairmile base was also developed at Colmslie from November 1942 (QHR 602465, 'Commonwealth Acetate of Lime Factory (former)'). As of April 1943, Brisbane's local defence vessels were to include: six Fairmiles and four Harbour Defence Motor Launches (HDMLs) (not yet on station); three minesweepers; one boom gate vessel; two examination vessels; one

controlled minefield tender; three coastal patrol boats; and 10 Naval Auxiliary Patrol (NAP) boats (NAA Item 398198).

[22] NAA Item 398198; NAA Item 657126; Spethman and Miller, *Fortress Brisbane*, pp. 21, 23; 'Indicator loops and harbour defences of the Royal Australian Navy in Moreton Bay'. The transmitting station for RAN 9's PE beam was located at Fisherman's Island.

[23] NAA Item 657126; Hermon Gill, G, *Australia in the War of 1939-1945, Series 2 (Navy) Volume II Royal Australian Navy, 1942-1945*, Canberra, Australian War Memorial, 1968. Appendix 2 – The Minesweepers, pp.708-9. The boom defence depot continued to store boom defence equipment in the post-war period (NAA item 1830009, 'Joint Parliamentary War Expenditure Advisory Committee visit to Queensland and Northern Territory'; NAA Item 657126; Department of Resources aerial photograph QAP008235266, 12 June 1946; 'Recovery of boom defences', *Examiner* (Launceston), 19 April 1947, p.6; 'Emphasis on sub danger', *Brisbane Telegraph*, 11 April 1950, p.3). The boom defence depot included a large storehouse with a concrete floor, and the floor slab was still visible southeast of the intersection of Farrer Street and MacArthur Avenue East, Pinkenba in 2009.

[24] NAA Item 5937920, 'Controlled Mining Base, Pinkenba', 1942-44, Secretary of the Naval Board to the District Naval Officer, Queensland, 24 May 1942 (mining depot to be inland), and Captain John D Campbell RN, to the District Naval Officer, Queensland, 7 June 1942 (suggested establishing Brisbane's mining depot near ACF and Shirley's new wharf at Pinkenba). ACF and Shirley's fertiliser works had been selected as the site for the mining depot on 1 June 1942 (NAA Item 657126).

[25] Victorian Heritage Database report 'Swan Island Fort', <https://vhd.heritagecouncil.vic.gov.au/places/125312/download-report> (accessed 7 June 2024); NAA Item 397594, 'Mining policy - 'Defensive' minefields in Australian waters', 1938-9; Naval Historical Society of Australia, 'RMS Operations by the RAN in the Pacific – World War II', <https://navyhistory.au/rms-operations-by-the-ran-in-the-pacific-world-war-ii/> (accessed 4 July 2024) (Mk.XIV mines laid off New Guinea); NAA Item 30477216, 'Queenscliff - Swan Island battery [mining depot - site plan]' plan dated 15 July 1941. In 1919 Australia was gifted 2000 British 'H' mines, and these were stored on Swan Island. However, these mines were disposed of in the early 1930s, as there was no established RAN policy for their use. Australia did not develop a mine-manufacturing capacity, or reactivate Swan Island as a mining depot, until early 1939. Mk.XIV mines and Mk.XV sinkers were then produced at the Ford Company's works in Geelong (NAA Item 397594).

[26] Queensland WWII Historic Places, 'USN Mine and Torpedo Depot (Camp Cootha)' <https://www.ww2places.qld.gov.au/place?id=964> (accessed 10 July 2024); 'Building the Navy's bases in World War II: History of the Bureau of Yards and Docks and the Civil Engineer Corps 1940-1946', Volume II, Part III, Chapter 26, 'Bases in the Southwest Pacific', pp.279, 280, <https://www.history.navy.mil/content/history/nhnc/research/library/online-reading-room/title-list-alphabetically/b/building-the-navys-bases/buidling-navys-bases-vol-2-chapter-26.html#1-26> (accessed 10 July 2024).

[27] NAA Item 471349 (copy of plan CM95); NAA Item 5937920 (copy of plan CM96).

[28] NAA Item 5937920, Captain John D Campbell RN, to the District Naval Officer, Queensland, 7 June 1942.

[29] NAA Item 5937920; NAA Item 1972173, 'Pinkenba Controlled Mining Depot - Base building', 1942 [actually a plan of the cable store]. The Acid factory building, the southern section of the understorey of which was enclosed with corrugated asbestos cement sheeting to store the mine cases and sinkers (Drawing S1560, 6 November 1942, in NAA Item 5937920), was located over 100m north of the Base Building. This building still exists in 2024 but was extended to the south in the 1950s (Resources, aerial photographs BCC000439302, 21 August 1951, and QAP1090006, 12 December 1960)

[30] NAA Item 5937920.

[31] NAA Item 5937920, Captain John D Campbell RN, to the District Naval Officer,

Queensland, 7 June 1942.

[32] NAA Item 5937920 (drawing S1494, 30 June 1942).

[33] NAA Item 11549365, 'Pinkenba Controlled Mining Depot – Base building', 6 October 1942.

[34] NAA Item 5937920 (memorandum for Secretary, Works Priorities Sub-Committee, 2 August 1942).

[35] NAA Item 679214 (War Cabinet approval, 12 August 1942); NAA Item 657126 (completion date). Expenditure approved for the mining depot included £2,425 for the Base Building and £500 for the cable store (as part of a £3,550 package including roads and a 5-ton jib crane for the wharf). In September 1942 it was noted that construction needed to be expedited, as faults had developed at the controlled minefields of Moreton Bay, which would necessitate the use of RAN 10 in the near future (NAA Item 5937920).

[36] NAA Item 5937920; NAA Item 657126. Initial designs were for a quarters and mess building to accommodate two officers, two petty officers and 16 naval ratings, but the design was altered to accommodate 3 officers, 6 petty officers and 30 ratings, due to plans to add a torpedo maintenance workshop at RAN 10. A sum of £2810 was approved in February 1943 for the 2-ton mobile crane, combined quarters and mess, fencing, and the mine and sinker store.

[37] NAA Item 5937920; NAA Item 657126. The lean-to shelter (£260) was approved in July 1943 and completed by the end of September 1943.

[38] NAA Item 5937920. RAN 10 was engaged in urgent maintenance of the minefields by 8 January 1943, 'but considerable discomfort is suffered by personnel due to no accommodation being available' (Naval Officer In Charge, Brisbane, telegram to Naval Board).

[39] NAA Item 657126. During Edward 2, three loops of L Mk.III mines were used for the first time in Australian waters (NAA Item 657126). These were ground mines without a sinker and with a charge weight of 909kg (Turner and Donohue, *Australian Minesweepers at War*, p.85). These seem to have been laid in the Pearl Channel.

[40] NAA Item 657126. The indicator loops and HDAs between RAN 4 and RAN 7 were recovered by HMAS Bangalow from November 1944, and then taken to Sydney in January 1945.

[41] NAA Item 1973234, 'Brisbane Pinkenba Naval Torpedo Depot – site plan showing proposed new buildings', June 1943 (on this plan, an annotation stated that the dispersed torpedo building was to be sited 'adjacent to existing magazine building off main roadway'). A plan of the dispersed torpedo stowage building, dated June 1943, shows a 40ft 6 inch by 30ft 6 inch (12.3m by 9.3m) timber-framed and gable-roofed single storey building, for 32 torpedos, with an overhead 2 ton travelling crane (NAA Item 1973225, 'Brisbane Pinkenba Naval Torpedo Depot – plan of Dispersed Torpedo Stowage Building', 1943). The RAN 10 site was selected for 'torpedo maintenance facilities for Royal Navy' in late 1942; the torpedo workshop was completed, except for a 2-ton overhead crane, in late 1943, but the torpedo depot still did not have electricity laid on by mid-1945 (NAA Item 657126).

[42] NAA Item 475221, 'Torpedo workshop facilities at Brisbane', 1945; NAA Item 927011, 'Basing of British Pacific fleet on Australia,' 1942-46. In 1944 the British Government had decided to send a naval taskforce to the Pacific to act under US command, to ensure the British were seen to be taking part in the defeat of Japan. Australia was selected as the base for the British Pacific Fleet, with the first battleship, HMS *Howe*, the flagship of Admiral Sir Bruce Austen Fraser, reaching Fremantle in December 1944. More of the fleet, including four fleet carriers, arrived in Fremantle in February 1945.

[43] NAA Item 475221; NAA Item 657126. During July-September 1945 RAN 10 personnel provided maintenance and security at both RAN 9 (ceased operation in early June 1945) and RAN 10 (until ABTU No.2 closed down) (NAA Item 657126).

[44] 'Queensland making superphosphate', *Queensland Country Life*, 17 October 1946, p.4;

'New factory opening', *Telegraph*, 25 October 1946, p.5; 'New standards for primary production. Commendable enterprise of A.C.F. & Shirley's Fertilizers Ltd', *Queensland Country Life*, 31 October 1946, p.8; 'A tour of the Works, triumph of mechanisation', *Queensland Country Life*, 31 October 1946, p.8.

[45] Resources, aerial photographs QAP008235266, 12 June 1946; BCC000439302, 21 August 1951; QAP1090006, 12 December 1960; QAP4443046, 19 August 1985; QAP4951119, 14 June 1991; and QAP5500035, 25 May 1998.

[46] Resources, Certificate of Title 15900200; Pers.comm, Stuart Heslin, Pinkenba Facility and Bulk Shipping Manager, 15 May 2024.

[47] Nothing remains of the PWSS tower of RAN 1 at Wickham Point, Caloundra. The once-buried mine control hut and power hut at RAN 2, Bribie Island [QHR 601143], survive, but are now exposed on the beach, due to coastal erosion. No buildings survive at RAN 2, Tangalooma (Richard Walding, 'Naval and Army fortifications at Moreton Island', <http://indicatorloops.com/comboyuro.htm> (accessed 7 February 2024)). The underground mine control hut and power hut survive at RAN 3, Cowan Cowan, along with the remnants of an observation post on the beach, and an observation post on a hill about 1300m to the east (Walding, 'Naval and Army fortifications at Moreton Island'). The former PWSS building at Cowan Cowan survives but was not part of RAN 3. At RAN 4 [QHR 601143], the above-ground indicator loop control hut and two power huts survive near the beach, opposite Eighth Ave, Woorim. Nothing remains of RAN 5 at Toorbul Point. At least one of the concrete magazines of RAN 6 survives, on Welsby Parade, Bongaree, at the caravan park (Spethman and Miller, *Fortress Brisbane*, p.47; Google Earth Streetview, May 2023). RAN 7's combined observation post and control hut, and power hut survive near the north end of The Strand, Bulwer, Moreton Island (Walding, 'Naval and Army fortifications at Moreton Island'). At RAN 8, some concretes slabs remain at Fort Lytton [QHR 600248], where the east end of the boom and its winch house were located. RAN 9's PE beam control hut and power hut, plus some concrete slabs of the quarters and mess building [QHR 602448], survive in the Myrtle town Reserve.