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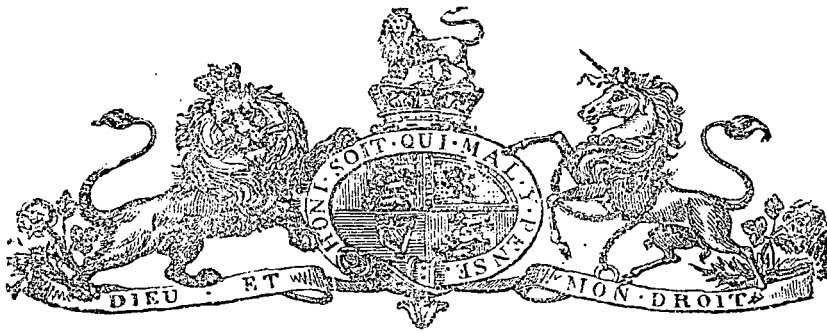
1884.

PARLIAMENT OF TASMANIA.

TASMANIAN ENGINEER CORPS:

REPORT FOR 1883.

Presented to both Houses of Parliament by His Excellency's Command.



TASMANIAN ENGINEER CORPS.

Staff Office, Hobart, 31st March, 1884.

SIR,

I HAVE the honor to forward to you this, my Report on the Tasmanian Engineer Corps, together with the Report by Captain Boddam on the work done during the first training of the Corps held in December last.

On the 6th December, the day of my arrival in the Island, I visited the drill-shed, and saw the Corps engaged in the technical work connected with the preparation of the mines, in which they showed creditable proficiency. I afterwards saw the men at drill under Captain Boddam, and was pleased with their steadiness on parade, and the manner in which they drilled, considering the short time they had been enrolled. Their regular attendance at the evening drills throughout the year, and their careful instruction by Sergeant-Major Anderson, under the direction of Captain Boddam, has resulted in the smart appearance which the Corps presents on parade. At subsequent drills which I attended, and during the laying out of the mines with the steamer *Kangaroo* on the 31st December, I found the men exhibiting a commendable zeal and efficiency in their duties. On the latter occasion, owing to the unwieldiness of the steamer and the difficulty in steering her, the work was partly carried out in the dark, and the men had to work under considerable disadvantages.

General re-
marks.

The Corps consists at present of 1 lieutenant, 14 non-commissioned officers, and 35 sappers. Captain Boddam, the Staff Officer, is in temporary command. Every credit is due to him for his exertions in forming the Corps, organising the workshops, getting the plant together, and in every way contributing to the efficient state of his present command. I do not, however, consider it advisable that, as Staff Officer of the Southern District, he should continue to command this Corps. There are manifest objections to this course being followed, and as soon as I can safely see the Corps handed over to the direction of one of its own officers, Captain Boddam will be relieved from his duty with it.

Composition of
Corps.

Mr. Henry is Electrician to the Corps, and has delivered lectures throughout the year, and instructed the men in the use of the galvanometers and electrical gear. It is, I think, to be regretted that there were difficulties in the way of his obtaining a commission as a combatant officer, as an acquired knowledge of drill, combined with his technical qualifications, would have fitted him for the post of commanding officer.

Mr. Burnett has recently been gazetted. He is zealous, and endeavouring to make himself efficient in all the duties connected with his position in the Corps. The non-commissioned officers are smart and intelligent, several of them occupying good positions in the mechanical community of Hobart. I propose to make two of them warrant officers, and place one in charge of the machinery and workshops, and the other the torpedo-boat which is shortly to arrive in the Colony. The sappers, with the exception of several seamen who are required for boat work connected with the submarine mining, are all tradesmen, in accordance with the Regulations, and are men of good physique, being none of them below the required standard,—5 feet 7 inches. They are intelligent and well-behaved, apparently anxious to make themselves proficient in the scientific work required of them, and, so far I can judge, are possessed of an excellent *esprit de corps*.

In addition to being instructed in the manual and firing exercises with the Martini-Henry rifle, with which the Corps is armed, the men were put through a course of musketry instruction by Sergeant-Major Anderson, with the good result that there are now 30 first-class shots on the list.

The entire Corps are sworn in for a term of three years, under new Regulations framed on "The Military Discipline Act, 1878." On my arrival in Tasmania, a rough

Regulations of
the Corps.

draft of these Regulations, drawn out by Captain Boddam, was submitted for my approval. I carefully revised them, and after having been approved by the Governor in Council at the beginning of February, they were issued on the 5th of that month; a parade was called on the evening of the same day, at which 37 members of the Corps were sworn in. There were 8 more who were unable to attend on that occasion, but who were sworn in shortly afterwards; and the few who were unwilling or unable to submit to the test of a fixed term of service had their places quickly filled by recruits, so that the Corps did not long remain below its full strength.

I held my official inspection of the Corps on the 4th January, at which there were 50 present. I then explained that the new Regulations were shortly to be promulgated, and expressed a hope that all would come forward and enlist for a fixed term, submitting to more military discipline than that in vogue in the other corps. It was, therefore, highly satisfactory to find the call so well responded to; and I hold it as a proof that there is no greater difficulty in this Colony than in those of the mainland to a fixed term of service,—which is the only system under which true discipline can be enforced and the requisite amount of efficiency attained.

Instructor.

On the 23rd December Quartermaster Sergeant Falconer, R.E., arrived in the Colony, and at once commenced work with the Corps,—superintending the completion of the fittings of the mines, preparation of the cables, tripping chains, &c., and the adjustment of the relays for testing the mines; but these, as pointed out by Captain Boddam, were useless, militating almost entirely against the results of the year's training. Quartermaster Sergeant Falconer was selected last Spring from the Royal Engineers' School of Mining at Chatham, and has been an Instructor in the corps for 7 years. I received high testimony of his abilities as an Instructor, and at once applied to the Crown Agents and the Admiralty for permission for him to go through a course of Whitehead torpedo instruction on board the *Vernon* at Portsmouth, in order that he might be capable of taking charge of Whitehead torpedoes, and be competent to run them, should the Government think fit to adopt them, to the boat now on its way to the Colony, and which I arranged for being strengthened in certain parts to carry the necessary davits and frames for the reception of two Whitehead torpedoes. Since joining the local Corps, Quartermaster Sergeant Falconer, R.E., has given ample testimony of his capabilities as an Instructor. The men have been divided into sections or classes for the performance of the work to which they are especially adapted, and are being regularly instructed after the system adopted by the Imperial service. For want of a boat, however, they are unable to receive instruction in mining, which is essentially part of a submarine miner's duty.

Operations of
the Corps.

In spite of the efficiency of the Corps,—considering the short time the men had been under instruction,—the results of the submarine mining operations were not satisfactory, owing to two causes; viz.—

1. The want of proper boat accommodation for conveying out and laying down the mines.
2. The imperfection of the "relays" and the electrical machinery of the lamp required to illuminate the mine-field.

The mines were to have been laid down on the 25th December, and a steamer was hired for the occasion; but it turned out that a better day's work was available for her elsewhere, and the offer made by Captain Boddam was thrown aside. The *Pinafore* was then engaged, and was brought to the jetty where the Corps was paraded and the mines conveyed for embarkation. Her owner refused to take them on board, as stated in the accompanying report, and the day was lost. There was then no craft available but the ferry steamer *Kangaroo*, which proved utterly unmanageable, it being, as I have already remarked, impossible to steer her properly against the wind and current; and in more than one instance several attempts had to be made before a mine was successfully laid. The electric light did not act well, and the darkness added considerably to the difficulty in carrying out the work.

Steam launch.

It is absolutely necessary before next training to acquire a proper steam launch for laying down the mines. A thoroughly serviceable boat, built by Messrs. White, of Cowes, or any builder of equal repute, would cost not far from £1000, and I would therefore recommend that endeavours be made to purchase the *Pearl*; failing this, a suitable vessel might be obtained in Melbourne or Sydney.

I would also call attention to the want of a cutter, brought forward in Captain Boddam's report. The acquisition of a boat for the use of the Corps is necessary, as the men must be taught to row, a knowledge of this exercise being part of their work, and

they should be constantly practising and accustoming themselves to boat-work, as one of the most necessary qualifications of a submarine miner is handiness in a boat. As soon as the next training commences a boat will frequently be required, and therefore the cost of hiring for carrying on the operations and for instruction throughout the year will be considerable. It is advisable, this being the case, to lose no time in purchasing a cutter.

With regard to the second point,—viz., the unserviceability of the plant supplied in Melbourne,—there is great cause for complaint. The relays for the mines and the electric lamp should have been properly tested before being sent over here. It was, further, one of the stipulations that some one from the firm should be sent to Hobart before the commencement of the training; but it is only recently that Mr. Josephs has visited the town and overhauled the stores supplied to the Corps. The results of his visit are stated in the Commanding Officer's Report. Had the matter been attended to at the proper time the laying out of the mines would have been entirely successful. The lamp now throws a satisfactory light, but the reflector is not powerful enough. It will be necessary to procure a "Mangin" projector in order to illuminate the mine-field to the opposite shore.

Quality of
stores from
Melbourne.

I beg to call attention to the recommendations of Captain Boddam with regard to the provision of a loading-shed and observing station, in order to carry on the necessary operations. It is manifest that the carting down of the mines after they are connected up is unadvisable, and I would urge the building of a suitable place this year; but I am of opinion that the jetty might be deferred until another year. A sum should be placed on the Estimates next year to build an observing station. The hydraulic testing apparatus spoken of in the Report should be obtained as soon as possible, so that the mines may be tested at the next annual training.

Increase of
Matériel.

I have now to refer to the Memoranda on the Submarine Defences of the Australian Colonies forwarded to me recently from your office, and to draw your attention to the suggestions made therein in so far as they refer to this Colony. Colonel Crossman recommends (pars. 11, 15, 28) that a small permanent force be enrolled in each Colony, who should be carefully trained under the Instructor as a nucleus, the members of which should be capable of assisting him in all matters of instruction when the Corps is undergoing its annual training. He considers that 6 men would suffice for this Colony.

I am of opinion that this would be a most important step to take; unfortunately, however, there is no permanent force to which these men could be attached for discipline, and until there is the enrolment of men in the Torpedo Corps as a military nucleus would not be possible.

There are, however, two appointments which it is necessary to make, for one of which there appears to be funds already provided. I refer to an Engineer and Caretaker of the torpedo boat. This man I propose to make caretaker of the machinery in connection with the lamp and other equipment on shore. He will be a fitter, and be able to do all the mechanical work required in repairing the engines, machinery, &c.

Engineer for
torpedo boat.

The other appointment is that of Storeman, whose work will be similar to that of the Storeman in the Military Store department. He will be permanently employed in the workshops under the Instructor, and should be a carpenter by trade so that all repairs to wood-work as well as new fittings will be done by him. He should receive the same pay as the Storeman at present in the force,—namely, six shillings per diem,—but with the addition of quarters. I append a schedule of the items I have recommended for your consideration, including a shed for the torpedo boat which is shortly to arrive in the island. The cost is approximate, and shows a balance of about £500, as there is about £1000 still available for expenditure. I would recommend that an offer of £450 be made for the *Pearl*, alluded to above. If she can be got for this sum a considerable saving will be effected, as I fear a new boat could not be obtained for a less sum than I have mentioned—viz., £1000. The *Pearl* has been inspected by a member of the Corps as regards her engines and boilers; she is stated to me to be in good order. Captain Boddam recommends her as very suitable for the work; she has considerable beam, and appears to be strongly built. If acquired by the Government she might be employed in lighthouse work when not required for the Corps. When an offer is made for her she should be officially examined by a Board nominated under your directions.

Storeman.

I have the honor to be,

Sir,

Your obedient Servant,

W. V. LEGGE, *Lieut.-Colonel R.R.A.,*
Commandant Local Forces.

The Hon. the Chief Secretary.

Engineer Office, 28th February, 1884.

SIR,

At your request I have the honor to submit the following Report on the annual training carried out in the Engineer Corps during the year 1883, and on the steps which it will be necessary, in my opinion, to take to complete the Torpedo Defences for the Colony and to provide for the more efficient training of the Engineer Corps in the future.

I have, &c.

E. M. TUDOR BODDAM,
Capt. Commanding Tasmanian Engineers.

The Commandant Local Forces.

*REPORT on Annual Training of Tasmanian Engineer Corps, and on Apparatus, &c.
required to complete the Submarine Defences of the Colony.*

Enrolment of Corps.

On the 29th March, 1883, the enrolment of the Corps was commenced, but by direction of the Government the men were not sworn in, as there was no regular Act under which they could be sworn, and as no regulations could be issued in the absence of that Act which would enable the men to be enrolled for a fixed term of service. They were, however, all given to understand that they would be enrolled for three years.

Composition.

The Corps is composed exclusively of professional men, mechanics, and seamen, and all the trades required for a submarine mining section or for carrying out the details of the work are properly represented.

Drill and instruction.

During the early part of the year, immediately after the course of recruit drill had been completed, the men were put through a short course of instruction. A series of six lectures were given at the commencement, illustrated by examples of the different classes of work that would be required, such as submarine mining, telegraphy, electrical testing, and after the nature of the duties were explained the men were allowed to choose the class of work in which they were to be instructed. It was found, with hardly an exception, that they chose the work for which they were best suited practically.

Details of course.

The submarine mining squad were instructed in knotting and splicing, crowning, insulating and jointing cables, wire splicing, loading and connecting up, making watertight joints and insulating plugs.

The testing squad were instructed in testing for conductivity and continuity, insulation resistance, internal resistance of batteries, fuze testing, balancing by Wheatstone's bridge, and in fitting and adjusting circuit closers and electro-contact work. No relays were received until just before the annual course, and were then found to be too defective to be used, so that the men could not be instructed in their balancing or adjustment.

The signalling party were instructed in flag and lamp signalling, and reading both by sound and on the tape on the Morse Sounder and Recording instrument.

Survey of Mine Field.

[This paragraph is confidential].

Annual training.

On the 3rd December, in accordance with the instructions of the Government, the Corps were called out for their annual month's training. This takes the place, as far as possible, of the summer training given to a submarine miner in the Imperial Service. During this course every member of the Corps was required to attend not less than 72 hours' instruction. Every member attended the requisite course, and a large number attended 100 hours. The practice consisted in preparing and laying out a third of the mines that would be required to be laid down in war time in their actual positions. The whole of the gear, such as cables, mooring lines, and tripping chains, were cut to the required lengths, and having been marked and put away are available for use whenever required in future. The whole of the work was carried out, and all the necessary wood and ironwork, fittings, &c. made in the shops, and the mines loaded, fitted, tested, and connected up before being laid down. For reasons before mentioned only a limited number of relays were available for use, and for this reason, and also for the want of a proper steam launch, the mines could not be thoroughly tested when in the water. The telegraph party were engaged during the month in signalling by flag and lamp from all sorts of positions, singly and in parties, and at both long and short distances, and at the end of the practice a large number of the men could send and read well. Being the first year of enrolment a considerable amount of marching drill and rifle exercises had to be gone through by all in addition to their other duties.

Laying out mines, &c.

On the 27th December the mines were connected up and the cables and attachments coiled all ready for laying; on the 28th the multiple cable and the disconnecter junction boxes laid down. The jointing had to be performed under difficulties, as the boats were not suitable, and it had to be performed in the dark. As it was the first time the men were engaged at this work, as might be expected, some of the joints were bad. On the 29th the whole of the mines,

cables, and connections were carted with considerable difficulty to the cattle jetty, but could not be laid out that day owing to the owner of the *Pinafore* refusing to carry out his engagement at the last moment, and actually steaming away from the wharf after arriving there for the purpose. The mines were placed on board the *Kangaroo* steamer on Monday, the 31st, and were laid down; but owing to darkness and its being impossible to sling the mines in the proper and safe way usually done on a properly fitted boat, great difficulty was experienced, and the operation was accompanied by a certain amount of danger. They were laid correctly with the exception of two, which owing to the darkness were dropped at the wrong marking buoys. One cable broke at the connecting box while being run, but all the rest were connected to the junction boxes.

After being left down three weeks the work of raising the mines was commenced. Although with a proper junction-box boat and a proper steam launch fitted for the work it would only have taken a day to raise the whole, with the steamer available and the appliances at hand it took three days' hard work, and it was impossible really to teach the men much either of laying-out or raising drill. There is no part of the work which requires so much practice, and as in war time it would be constantly necessary to pick up and lay down mines to keep the field in working order, and to do it both precisely and quickly, and as also there are no boats available in any case for the work in the port, it seems most imperative to at once procure them. Raising mines.

The mines, although not of the best pattern (viz., steel spherical), are, now that the extra buoyancy has been provided, fit for the work, and will effect the purpose required of them; the river being an unusually foul one as regards marine growth will, however, necessitate their constant inspection while down. The base-joints were good, and the mines were all thoroughly watertight. Apparatus and submarine mining equipment.

The electro-contact works could not be properly tested, as we had no steamer available for bumping, but I see no reason why they should not answer well. The relays were found to be quite unserviceable, and they have been returned to the makers, who have agreed to supply others in their stead. The envelopes require to be soldered at the centre joint, but this can be done in the workshops. The service pattern is in one piece. The insulating plugs were found defective, but a new way of making them up will be adopted in future. It is, however, quite impossible to be sure of these connections without testing them by hydraulic pressure before laying out, and a proper testing apparatus is very much required. The cable, wire rope, chain and other attachment gear were found to be thoroughly reliable and in good order. The batteries were of good pattern, and the whole of the instruments, except the astatic galvanometers, which have been returned to the makers, are of the proper pattern and fit for service. Two sets of coils and Wheatstone bridges are required.

The electric light was found on trial to be defective, and was condemned until such time as it was put in proper order by the makers. The machines were found both to be defective; the insulation was repaired in one, and the armature had to be completely rewound in the other, the commutators had to be returned, and plates adjusted. The lamps were in bad working order, but of course could not be expected to give a proper light with defective machines. They are now properly adjusted and work well. The parabolic reflector, although suitable for lighting large areas, is not so for a search light, and it would be advisable to procure a small Mangin projector, or else one of the cheaper plate-glass reflectors now under trial, if they prove to be a success. Electric light.

[This paragraph is confidential.]

Observing station.

At the time of ordering the apparatus no method of firing was settled on by General Scratchley, and consequently the necessary instruments for observing were not ordered with the other equipment.

At present there is no proper loading-shed, and the mines have to be connected up in the drill-yard and carted down to the jetty. This is apt both to disarrange the adjustment of the works, and would double the work if the mines had really to be filled with live charges. I would recommend that a small jetty be constructed at the northern end of the Slaughter Yard, and a loading-shed be built on the rifle range. A small tramway leading from the loading-shed to the jetty would be necessary, and at a small extra expense would render the arrangements perfect. The ground on the range would make a very good connecting-up ground. Loading-shed and connecting-up ground.

It is absolutely necessary, if submarine mining is to be carried out, that a small steamer or steam-launch should be purchased, and also a good twelve-oared cutter for a junction-box boat and to teach men their work on the water. The only vessel in the port at all suitable for laying or raising mines is the *Pearl*, and she might, at small expense, be altered and fitted for the purpose. Hearing that she would be for sale, I had her thoroughly inspected by Mr. Stalker, a properly certificated marine engineer (a member of the Engineers), who reported that she was thoroughly serviceable. I do not know what she would be sold for, but the value is about £450. The cost of a new boat would be about £800 and freight out. A good cutter would cost about £50, the Navy having none for sale. Steamer and boats.

Shed for boats. As the torpedo boat is shortly expected, it will be necessary to provide a proper boat-shed and a small cradle and slip, and this shed could be made to accommodate all the boats. Between the Derwent Rowing Club shed and the cattle jetty would be a good place for its erection.

Engineer and Storeman. It is absolutely necessary for a Storeman to be told off permanently for the torpedo stores, and a good hand will also be required to look after the engines of the torpedo boat and launch, and also the boats.

If the above recommendations are approved of, I should propose at once to set about preparing the necessary plans and specifications, also estimate of cost.

E. M. TUDOR BODDAM,
Captain Commanding Tasmanian Engineers.

28th February, 1884.

ESTIMATE of Cost of Loading-shed, Boat-shed, and Testing Apparatus.
4th April, 1884.

Name.	Description.	Estimated Cost.	Remarks.
		£ s. d.	
Boat-shed	70 feet × 12 feet × 6 feet high in the clear; timber and corrugated iron	90 0 0	
	Excavating foundation in rock, 50 feet × 15 feet × 3 feet = 50 yards, at 7s.....	17 10 0	
Cradle for boat and slip	Timber-framed, 6000 feet, board measure, at £1.....	60 0 0	
	350 feet iron rails, 40 lbs., at £4 10s.=2½ tons.....	10 3 6	Old rails.
Loading-shed	Fittings and winch.....	30 0 0	
	50 feet × 16 feet × 10 high in clear	160 0 0	Timber and corrugated Iron.
Tramway from shed }	210 feet, including jetty, requires 9000 feet of framed timber, at £1	90 0 0	
	Iron rails, 2½ tons, at £4 10s...	12 7 6	Old rails.
Truck, estimated cost	15 0 0	
Hydraulic testing apparatus, cost	37 0 6	
	Freight, 2 tons, at £1 10s.	3 0 0	
		£525 1 6	

E. M. TUDOR BODDAM, Captain and Staff Officer.

Forwarded.
W. V. LEGGE, Lieut.-Colonel R.R.A.,
Commandant Local Forces.