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1915.



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COMMONWEALTH OF AUSTRALIA.

C. B. Rowdell
Clerk of the Senate.
20-5-15.

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

REPORT

TOGETHER WITH

MINUTES OF EVIDENCE AND AN APPENDIX

RELATING TO THE PROPOSED

ERECTION OF BUILDINGS AT FLINDERS NAVAL BASE.

PRESENTED TO PARLIAMENT IN ACCORDANCE WITH THE PROVISIONS OF THE "COMMONWEALTH
PUBLIC WORKS COMMITTEE ACT 1913-1914."

MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

(First Committee).

EDWARD RILEY, ESQUIRE, M.P., Chairman.

Senate.

Senator the Honorable John Henry Keating
 Senator Patrick Joseph Lynch (Vice-
 Chairman)
 Senator William Harrison Story.

House of Representatives.

James Edward Fenton, Esquire, M.P.
 William Fyfe Finlayson, Esquire, M.P.
 The Honorable Henry Gregory, M.P.
 Sydney Sampson, Esquire, M.P.
 William Henry Laird Smith, Esquire, M.P.

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS:

BUILDINGS PROPOSED FOR FLINDERS
NAVAL BASE.

REPORT.

THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS, to which the House of Representatives referred for consideration and report the question of the erection of necessary buildings at Flinders Naval Base, has the honour to report as follows:—

INTRODUCTORY.

1. In pursuance of the policy adopted as a result of the recommendations made by Admiral Sir Reginald Henderson, K.C.B., in his report on the general administration, organization, distribution, &c., of the Naval Forces of the Commonwealth, an area of land was acquired by the Commonwealth for Naval purposes at Hann's Inlet, Westernport, Victoria, for the establishment of the Flinders Naval Base.

2. A Board, consisting of the Second Naval Member, the Commander in Charge of the Williamstown Naval Depôt, and the Director of Naval Works, then visited the site and submitted a general scheme for the lay-out of the site and the provision of necessary accommodation. This scheme was drawn up on the basis of the proposals outlined by Admiral Henderson, although some variations were suggested (see paragraph 13).

3. A memorandum of requirements was submitted to the Department of Home Affairs, and the present proposal is the outcome of conferences between representatives of the Naval Department and the Department of Home Affairs.

4. The Naval Depôt at Williamstown is included in the list of properties transferred by the State of Victoria to the Commonwealth, but a promise has been made that it will be vacated as soon as arrangements can be made to provide accommodation for Commonwealth requirements elsewhere. On completion of the buildings now proposed it will be possible to carry out this promise and remove to Flinders Naval Base the whole of the *personnel* now accommodated at Williamstown.

5. A visit to the Naval Depôt at Williamstown made it clear to the Committee that the present system of training men for service in the Navy produces a workman of a high degree of technical skill; it also demonstrated the urgent necessity for increased accommodation if the work of the Depôt is to be carried out with the requisite degree of efficiency.

PRESENT PROPOSAL.

6. The proposal now under consideration is to erect officers' residences and accommodation for 78 chief petty officers and petty officers and 584 men—this accommodation to be subsequently extended to provide for 316 chief petty officers and petty officers, and 2,052 men, as requirements grow.

EXTRACTS FROM THE VOICES AND PROCEEDINGS OF THE HOUSE OF
REPRESENTATIVES.

No. 26 OF 17TH DECEMBER, 1914.

5. PUBLIC WORKS COMMITTEE—WORKS REFERRED TO.—Mr. Fisher, for Mr. Archibald, moved, pursuant to notice, That the following works be referred to the Parliamentary Standing Committee on Public Works in accordance with provisions of *Commonwealth Public Works Committee Act 1913*, viz:—

1. Flinders Naval Base—Works under the control of Department of Home Affairs, including
 erection of necessary buildings

Debate ensued.

Question—put and passed.

ESTIMATE OF COST.

7. The estimated cost of the buildings taken into consideration by the Committee is as follows:—

	£	£
<i>Chief Petty Officers and Instructors—</i>		
Brick Buildings (First Section, 78 men)	8,857	
Electric Light Installation	245	
Heating Installation	760	
		9,852
<i>Kitchen (to serve above)—</i>		
Timber and Iron	584	
Electric Light Installation	30	
		614
<i>Bakery (with oven) to serve the whole institution—</i>		
Timber and Iron	1,200	
Electric Light Installation	25	
		1,225
<i>Seamen's Barracks—</i>		
Two Brick Buildings (each for 342 men)	27,654	
Electric Light Installation	750	
Heating Installation	1,700	
		30,104
<i>Dining Rooms—</i>		
Timber and Iron (for 684 men for the above two blocks)	1,754	
Electric Light Installation	140	
Heating Installation	450	
		2,344
<i>Kitchen—</i>		
Timber and Iron (to serve the above two barrack blocks and a future block)	805	
Electric Light Installation	30	
		840
<i>Warrant Officers' Quarters (First Section, 16 Officers)—</i>		
Brick Buildings, with Kitchen, Stewards' and Cooks' Rooms	5,534	
Electric Light Installation	140	
		5,674
<i>Single Officers' Quarters (First Section, 16 Officers)—</i>		
Brick Building, with Kitchen, Stewards', and Cooks' Rooms	5,534	
Electric Light Installation	140	
		5,674
<i>Drill Hall, Armoury and Offices—</i>		
Timber and Corrugated Iron	3,150	
Electric Light Installation	100	
		3,250
<i>Ammunition, Lecture Room, and Offices—</i>		
Timber and Corrugated Iron	1,300	
Electric Light Installation	60	
		1,360
<i>Armourers' Workshop—</i>		
Timber and Corrugated Iron	370	
Electric Light Installation	25	
		375
<i>Drill and Stripping Battery (First Section)—</i>		
Timber and Corrugated Iron	1,700	
Electric Light Installation	50	
		1,750
<i>Shooting Battery (First Section)—</i>		
Timber and Corrugated Iron	1,500	
Electric Light Installation	40	
		1,540
<i>Victualling Store (for Beef, Vegetables, &c.—First Section)—</i>		
Timber and Corrugated Iron	1,990	
Electric Light Installation	55	
Cold Storage Installation	1,100	
		3,145
<i>Store (for Clothing, Implements, &c)—</i>		
Timber and Corrugated Iron	2,700	
Electric Light Installation	80	
		2,780

	£	£
<i>Store (for Inflammables)—</i>		
Brick and Concrete	850	
Electric Light Installation	25	
		875
<i>Naval Store—Miscellaneous Articles—</i>		
Timber and Iron	2,700	
Electric Light Installation	80	
		2,780
<i>Naval Store—Metal Articles, &c.—</i>		
Timber and Corrugated Iron	2,900	
Electric Light Installation	80	
		2,980
<i>Naval Store—Stationery and Condemned Stores (First Section)—</i>		
Timber and Corrugated Iron	1,800	
Electric Light Installation	50	
		1,850
<i>Surgery—</i>		
Timber and Weatherboards	370	
Electric Light Installation	15	
		385
<i>Receiving Shed (First Section)—</i>		
Timber and Corrugated Iron	1,700	
Electric Light Installation	50	
		1,750
<i>Administrative Block—</i>		
Timber and Fibro-Cement	3,000	
Electric Light Installation	100	
		3,100
<i>Main Guard—</i>		
Timber, Corrugated Iron, and Bricks	1,100	
Electric Light Installation	50	
		1,150
<i>Boatswain's Store, &c.—</i>		
Timber and Corrugated Iron	700	
Electric Light Installation	40	
		740
<i>Torpedo and Mining School (First Section)—</i>		
Timber and Corrugated Iron	3,300	
Electric Light Installation	175	
Heating Installation	400	
		3,875
<i>Latrines—</i>		
Timber and Iron	300	
Electric Light Installation	10	
		310
<i>Painter and Plumber Shop—</i>		
Brick Building	400	
Electric Light Installation	20	
		420
<i>Boat Store, Boat Builders' Shop, &c.—</i>		
Timber and Corrugated Iron	5,000	
Electric Light Installation	200	
		5,200
<i>Magazine—</i>		
Brick Building	600	
		600
<i>Wireless Telegraphy Station—</i>		
Brick Building	700	
Electric Light Installation	35	
		735
<i>Wireless Telegraphy and Signal School—</i>		
Timber and Corrugated Iron	3,500	
Electric Light Installation	175	
Heating Installation	400	
		4,075
<i>Captain in Charge—</i>		
Brick Residence	2,300	
Electric Light Installation	60	
		2,360

		£	£
<i>Senior Officers—</i>			
Brick Residence (No. 1) ... ..	...	1,700	
Electric Light Installation ... ..	...	50	
		<hr/>	1,750
Brick Residence (No. 2) ... ..	...	1,700	
Electric Light Installation ... ..	...	50	
		<hr/>	1,750
<i>Junior Officers—</i>			
Brick Residence (No. 1) ... ..	...	1,200	
Electric Light Installation ... ..	...	40	
		<hr/>	1,240
Brick Residence (No. 2) ... ..	...	1,200	
Electric Light Installation ... ..	...	40	
		<hr/>	1,240
<i>Warrant Officers—</i>			
Timber Residence (No. 1) ... ..	...	650	
Electric Light Installation ... ..	...	30	
		<hr/>	680
Timber Residence (No. 2) ... ..	...	650	
Electric Light Installation ... ..	...	30	
		<hr/>	680
		<hr/>	690
		<hr/>	<u>£111,032</u>

8. This does not comprise the full requirements of the complete Naval Sub-Base, but only what might be called the first section of the work, which will provide for officers' residences and the accommodation and training of about 78 chief petty officers and petty officers, and 684 men.

9. The Committee in the course of its inquiries learned that the estimated cost of the whole of the buildings required is approximately £500,000.

10. In this report, however, the Committee purposes confining itself to a consideration of the first section of the buildings as enumerated above and which involve a probable expenditure of £111,032.

COMMITTEE'S INVESTIGATIONS.

11. The Committee visited the Base and, in company with the responsible officers of the Naval Department and the Department of Home Affairs, carefully inspected the sites of the various buildings proposed. The general scheme of the layout was explained by the Director of Naval Works on the ground, and subsequently the plans of the separate buildings were explained in detail by the Chief Architect, Department of Home Affairs.

12. The Committee also availed itself of the advice and experience of the Chief Architect, State Public Works Department, Victoria, and of the City Architect, Melbourne, and informed itself on many points in connexion with building material and construction.

13. The Committee was aware of the contents of Admiral Henderson's report and noticed that certain buildings are proposed for Flinders Naval Base which were not contemplated by him. It was adduced in evidence that, while Admiral Henderson recommended that Sydney should be the Naval Depot with gunnery, signalling, wireless telegraphy, and other schools, it is now proposed by the Naval Authorities to establish such schools at the Flinders Base. It was stated that Admiral Henderson's recommendation was intended to apply when the whole fleet will be at its maximum development, which will be many years hence. Without in any way infringing the spirit of the advice tendered, however, it was submitted that until fleet requirements demand the establishment of schools at Sydney, it would be better to have such schools all at one place, under one supervision, and in the meantime the best place is said to be Westernport.

14. The Committee sees no objection to this proposal provided care be taken that no unnecessary duplication of buildings takes place at Westernport and Sydney.

CONCLUSION.

15. After a careful scrutiny of the plans and mature consideration of the whole of the evidence placed before it, the Committee is satisfied that the buildings have been carefully designed, due regard having been paid to lighting, ventilation, and general convenience. The structures are economical and the general style and manner of construction satisfactory for the purposes for which they are intended.

16. The Committee therefore recommends that the erection of the buildings as enumerated in paragraph 7 at an estimated cost of £111,032 be proceeded with, in accordance with the plans prepared by the Department of Home Affairs which have been examined by the Committee.

17. The decision arrived at by the Committee is shown in the following extract from its Minutes of Proceedings:—

Senator Story moved—That the erection of the buildings as enumerated in the statement submitted by the Department of Home Affairs at an estimated cost of £111,032 be proceeded with, in accordance with the plans which have been examined by the Committee. Seconded by Mr. Laird Smith. Carried unanimously.

Edward Riley

Chairman.

Office of the Parliamentary Standing Committee on Public Works,
120 King-street,
Melbourne, 4th May, 1915.

MINUTES OF EVIDENCE.

(Taken at Melbourne.)

THURSDAY, 11th MARCH, 1910.

Present:

Mr. RILEY, Chairman;	
Senator Keating,	Mr. Finlayson.
Senator Lynch,	Mr. Gregory,
Senator Story,	Mr. Sampson,
Mr. Fenton,	Mr. Laird Smith.

John Smith Murdoch, architect, Department of Home Affairs, sworn and examined.

1. *To the Chairman.*—I have had to do with the drawing of the plans for the Flinders Naval Base, and I have with me the plans that I have completed. As to the buildings which the Government propose to erect first, the members of the Committee may remember that we went over the site the other morning—that is, the site of the official buildings at Flinders Naval Base as distinct from the site of the residential and hospital buildings. The first proposal is to put up accommodation for seventy-eight chief petty officers and petty officers, the accommodation to be afterwards increased to 316; and for 684 men, to be increased afterwards to 2,052, as the requirements grow. The plan shows the Parade Ground, which the Committee saw the other day, and the proposal is to have, in the middle of the western side of the parade ground, the building for the chief petty officers and petty officers, and on each side of that building to have three blocks to accommodate 342 men in each. The present scheme, as I have said, is to provide for a third of that number—that is for 684 men, who will go into two blocks to accommodate 342 each. We propose, therefore, to erect two blocks to the south, and then, afterwards, a third one to the south; and these, I think, we may call the training quarters or barracks. The plan shows a general scheme for the accommodation of chief petty officers, petty officers, and men. It is proposed, at the northern end of the Parade Ground, to put up quarters for unmarried commissioned officers, Lieutenants, Commanders, and so on. The Government Estimates do not define any particular buildings. They provide a sum to erect buildings at the Naval Base to meet naval requirements, and what I am describing are the requirements put forward by the Navy; they have asked us to provide accommodation for the numbers stated, and this we are proceeding to do, keeping in view the eventual number.

2. *To Mr. Finlayson.*—The accommodation will be for sixteen unmarried commissioned officers in one building, this number to be afterwards increased to twenty-four. At the opposite end of the Parade Ground—the southern end—a similar building exactly is proposed for the warrant officers, who, I understand, are officers just on the borderland of receiving a commission—something more than chief petty officers, and something slightly lower than commissioned officers.

3. *To Senator Lynch.*—The Government Estimates of last year provide for the erection of the Flinders Naval Base, including barracks and other

buildings, at a cost of £31,760; officers' residences, £5,250; gunnery and training schools, £26,870; workshops, £20,500; wireless telegraph station, £3,500; storehouses, offices, &c., £35,720; or a total of £124,000. I understand that the £31,760 has already been passed by Parliament, and that all the particular buildings on the plans I have here have been provided for. The first item of £31,760 for "barracks and other buildings," is rather flexible a description, is it not? The first portion of barracks for chief petty officers and petty officers, including kitchen buildings, mess-room buildings, and bakery, which will be sufficient to serve the whole institution, are estimated to cost £10,641. Two blocks of seamen's barracks, including dining-rooms, are estimated to cost £14,704 each; and a kitchen building capable of serving these two blocks, and a further block of barracks when it is erected, will cost £805. That is a total for the two blocks of barracks buildings of £30,213, or £44 per head for the men who will occupy the building—that is, we house and provide cooking and dining accommodation for the men at the rate of £44 each.

4. *To the Chairman.*—This accommodation does not include officers, but only seamen who sleep in hammocks. The single officers' quarters are estimated to cost £5,534. This includes a separate bedroom for each officer, a general mess-room, recreation-rooms, a kitchen, and other buildings. Warrant officers are to be provided for in a building to cost a similar amount of money. We do not propose to make any difference between the accommodation provided for the commissioned officers and the accommodation provided for the warrant officers; and, therefore, the building will be of exactly similar design, and cost a similar amount. We consider that the officers' quarters, in the matter of cost, have been reduced to the last point of economy, and that any further reduction in the case of the warrant officers would hardly be possible. It would, perhaps, be desirable for me to describe the general arrangement of these plans. Those of which I have spoken practically complete all the barrack buildings proposed, with the exception that behind the petty officers' barracks and the men's barracks we propose to have dining-rooms and kitchen—to be timber-frame buildings covered with corrugated iron. This is really introduced, to some extent, in opposition to naval views. The Navy people wanted the men to have their meals in their sleeping rooms, but the Director-General of Works pointed out that he thought that, by economizing in the barracks proper—by making them three stories high—we could save enough money to build iron dining-rooms behind, so as to avoid compelling them to eat in their dormitories. We also increased the cubic sleeping capacity per man by, roughly, 130 feet.

5. *To Senator Lynch.*—The men all sleep in hammocks in dormitories.

6. *To the Chairman.*—The central building of all is for the petty officers and chief petty officers. At present, as I have already explained, we propose to accommodate 78, and to eventually accommodate 316. The portions of the building we propose to build now are those which you see tinted pink on the plan, and then follow the green

buildings, the blue buildings, and the brown ones. The right wing will go up three stories, and also the left wing, while the central block, which divides the wings, will go up two stories. The central wing includes mess accommodation for the whole of the institution when finished, with recreation accommodation, and so forth; that is, it will be sufficiently large to meet the wants of the whole 316 men. In the wings we have provided the sleeping accommodation. On each floor there is a barracks for 28 men, a barracks for 20 men, and a barracks for 10 men. A space on the ground floor is given up as a room for chests. Each man has a chest, which he is not allowed to take into his room, but he is allowed to store it in this room, where it is accessible to him. The drawings before us show the upper floor. The next plan shows the east elevation of the middle and two-storied block, and the right and left wing. On the ground floor the verandah goes right round the building, but on the upper floors the balconies are confined to the north, south, and west sides, leaving open the east side, because in Victoria I think the morning sun is important. In fact, the eastern sun in this climate is welcome in any house, and that is why the verandahs and balconies are not continued right around; this is a point on which the Director-General of Works is very keen. As I explained the other day, I desired to have the balconies continued, but the Director-General took up what is perhaps the very sound view that if they were found necessary they can be erected afterwards. The buildings are just plain, simple brickwork without painting, whitewashed inside, with hardwood floors and corrugated-iron ceilings; in fact, it is the cheapest that we could make. The buildings will be fire-resisting, and well ventilated. The sailor men go about with bare feet, and must have wooden floors; and with the verandah-posts and other means of exit, there is scarcely any chance of their being caught by fire. The lavatories are in a separate building, each floor having separate W.C.'s, and so forth. These are isolated buildings, connected with the main building by covered ways and balconies, thus allowing a perfectly free circulation of air. The kitchen buildings are at the back, and the food is carried to the dining quarters along a path, which, up to the present, is not covered. It will be very easy to add a covered track should it prove necessary. Behind, again, are the bakery buildings, which are intended to serve the whole institution—men of all ranks.

7. *To Senator Story.*—I think it probable that the cost of all buildings will run into £125,000 or £130,000, and we find it difficult to spend more than £50,000 or £60,000 a year. It will be two years, I think, before the buildings are ready for occupation—that is, the buildings with which we are now dealing.

8. *To Mr. Laird Smith.*—The buildings I am now referring to will be erected on solid ground, and not on made ground.

9. *To the Chairman.*—I think we could put up the brick buildings in about eighteen months. These are separate buildings, which can be carried out independently of each other. You cannot crowd a great many workmen on one building; but, with separate buildings, we can duplicate or triplicate them.

10. *To Senator Lynch.*—I take it that we shall commence the three brick buildings simultaneously if the funds are forthcoming.

11. *To Senator Keating.*—The cost of the first portion of brick barrack buildings will be £36,500,

but the accommodation for warrant officers and unmarried commissioned officers will increase the cost by £11,068.

12. *To Mr. Penton.*—I could not say when the brick buildings will be ready for occupation, but I believe the intention is to shift the institution from Williamstown, where the temporary quarters are not good.

13. *To Senator Lynch.*—The Department built the quarters at Williamstown.

14. *To Mr. Laird Smith.*—A portion of the Williamstown quarters will be shifted to Flinders Naval Esplanade.

15. *To Mr. Finlayson.*—I do not know that the brick buildings are very urgently required.

16. *To Mr. Sampson.*—I should think we will save 30 per cent. by having the kitchen buildings and so forth of wood and iron. If we have the whole of the buildings at present contemplated made of wood and iron, I should think the saving would be from £25,000 to £30,000.

17. *To the Chairman.*—I think we can land bricks at Flinders Base for 40s. or 41s.

18. *To Mr. Sampson.*—On the kitchen and back buildings alone the saving represented by wood and iron construction I take to be about £5,000.

19. *To Senator Lynch.*—The Government do not insure any of their buildings. My own experience is that we have lost only about one drill-hall, and two or three small post-offices by fire in a great number of years.

20. *To Mr. Laird Smith.*—In Queensland, our buildings are all of wood, and I know of only two small fires in twenty years.

21. *To Mr. Finlayson.*—As to the life of a wood building, I should say that the total renewal would represent a very long time. The iron covering might be worn out in forty years, but I should think a total renewal would not be necessary in less than twice that period.

22. *To Senator Lynch.*—The galvanised iron is subject to corrosion in low-lying parts near the sea, but that is met by treating it with boiled linseed oil and cement.

23. *To Senator Story.*—That treatment also tends to make the buildings cooler.

24. *To Mr. Penton.*—The treatment is applied straight away to the buildings.

25. *To Mr. Laird Smith.*—The reason we are putting up iron buildings is that the Naval authority gave an estimate for a building, and the Director-General of Works pointed out that, in his opinion, it would be possible, by economising in certain directions, to put up a simple building behind, and thus enable the men to dine away from their sleeping quarters.

26. *To Mr. Finlayson.*—All these gymnasiums, store-houses, and so forth are of wood and iron, and one story, and a great many of them are to be erected on made ground, where it would be very difficult to put a brick building.

27. *To Mr. Laird Smith.*—The Minister of Defence laid down the principle that we were to put the cost of drill halls down to bedrock, there being so many required; and those drill halls are made of wood and iron, and are found good enough.

28. *To Mr. Penton.*—The life of a hardwood frame building is a very long one. At Townsville, there are some buildings over thirty years old, and the frames are so good that they are being shifted to be utilized elsewhere.

29. *To Mr. Finlayson.*—It is proposed to start straight away, not only with the wood and iron buildings on the made ground, but also with the brick buildings. The first building we require is

the store building, in which to store cement, and so forth; and we have a small erection there as a start.

30. *To the Chairman.*—I should now like to show you the plan for the men's barracks, which are a typical block for ordinary seamen. This is a three-story brick building, comprising twelve dormitories for 26 men each, in hammocks; and three dormitories for 14 petty officers each. These are the petty officers whose homes are really in another building, but who are in this part looking after the men at certain hours. This means that there are 300 men in the block, and 42 petty officers looking after them. Behind the men's quarters are three dining-rooms for 100 men each, one dining-room for the 42 petty officers on duty, and a kitchen. Of course, one kitchen will do for the two blocks, and for the third block when it is added. The warrant officers and the commissioned officers dine in their own places.

31. *To Mr. Finlayson.*—The dining-room for the 42 officers is only for officers actually on duty at the time.

32. *To the Chairman.*—The plan now before us shows the elevations of the building. The lavatory arrangements are exactly the same as in the first building I described; that is, there are separate annexes on each floor.

33. *To Senator Lynch.*—The verandah and balcony arrangements are the same in both cases. Only, in this case, the balcony is omitted from the north and the south—it is only on the west side. The building runs north and south. As I have said before, the morning sun is the welcome sun in Australia; it is a good thing to flood your house, especially the bedrooms, with the eastern sun in the mornings. The next plan shows the section of the barracks. There is an open staircase through which the wind is allowed to whistle freely. Behind is the lavatory accommodation; and then we have a wood and iron kitchen and dining-room buildings.

34. *To Senator Lynch.*—The naval people do not believe in the arrangement we have made, but rather in dining the men in the barracks. However, I believe the Minister of Defence agrees with us, and has given us permission to make the dining-rooms apart. I do not think there is any hardship in asking a man to go up two flights of stairs; I do so every night myself.

35. *To Senator Gregory.*—From floor level to floor level is 13 ft. 9 in., and we secure about 600 cubic feet per man as against the naval proposal of about 400. Colonel Oweh got Dr. Norris, in London, to make inquiries as to what was done in this respect by Germany and other countries, and the information was some guide to us. The old-fashioned ideas in this respect are getting out-of-date, and seamen and others are having much more regard paid to their requirements. All the brick buildings are on natural ground, and there are no cellars in them.

36. *To Mr. Finlayson.*—The scheme includes the erection of a brick oven in the bakery, sufficient to supply the whole institution. The scheme for the central building, in the way of bakery, kitchen, and so forth, will meet all the developments in each section.

37. *To Mr. Gregory.*—The brickwork is 192 ft. 8 in. long by 35 ft. 8 in. wide, and the height from the foundation to the eaves is 42 feet. That space will be altogether independent of the lavatories.

38. *To the Chairman.*—From the foundation up to the level of the ground floor the walls are 18 inches thick; then come two floors of 14 inches thick, while the walls of the top floor are 9 inches

thick. The walls are hollow where they are not protected by verandahs. If my advice prevails, we shall build with one part of cement added to four or five parts of lime, according to the quality of the lime. This will give the mortar all the hydraulic qualities required in an ordinary case. All the floors of the lavatories, and so forth, will be of concrete. All the staircases are of jarrah—chick jarrah planks—because the mortar is about bare-footed, and it would be rather cruel to use concrete or iron. The next buildings to consider are those for the single commissioned officers, and the similar block for the single warrant officers, one set of plans doing for the two. The plan before us shows the front elevation of the building, which is two-story—that is, the right and left wing are two stories, each containing eight bedrooms 16 ft. 6 in. by 10 feet, while the middle part of the building is one story, and contains dining-room, reading-room, billiard-room, kitchen, stores, serving accommodation, and accommodation for stewards and cooks.

39. *To Mr. Finlayson.*—There are two floors of eight bedrooms. The main entrance is in front of the central building. Straight ahead is the dining-room, and right and left of the dining-room are the billiard room and reading-room. The two-story wings at each side contain four bedrooms on each floor, with bathrooms and lavatories. As I have said, the present accommodation is for 16 officers, extendable to 24 officers. We find our plan the best to adopt for the purpose. All the rooms open on to the front balconies, and every provision is made for thorough ventilation. A similar system has been adopted at Jervis Bay, and, I think, found satisfactory.

40. *To the Chairman.*—At Jervis Bay we have accommodation for 12 unmarried officers, extendable to 24 officers. The building will eventually be the same size as that on the plan before us. Of course, there are a great number of married officers at Jervis Bay, but only unmarried officers are to be accommodated in the quarters we are now considering. Each man will have a bedroom to himself. This building is going to cost £5,534, and it is to accommodate 16 officers, or a cost per officer of £345. This I do not regard as very expensive. As the number of officers is increased in the way I have indicated, the cost per head will of course be reduced. At present, each officer has to represent his share of all the accommodation provided.

41. *To Senator Story.*—There will be brick partitions between the bedrooms which will be plastered. As I have said before, I do not think £345 is excessive; and it will be reduced probably to £250.

42. *To Mr. Finlayson.*—There is lavatory accommodation for each floor.

43. *To the Chairman.*—There is provision for several dining-rooms for the various ranks. The commissioned officers have their own messroom, billiard-room, dining-room, and kitchen, and accommodation for their own staff.

44. *To Mr. Gregory.*—The officers' quarters are about half a mile away from the other building; the whole length of the parade ground lies between. I do not think I should call the estimate for the officers' quarters an excessive one. An officer is a man who is accustomed to a good deal of comfort. All the roofs are iron, but I think the officers' rooms will be plastered. Personally, I do not care for metal ceilings. The building before us is just as simple a one as we could make consistently with ordinary comfort. It is a great matter to get a through draught of air in each room; it is far better than having an inside corridor with rooms on either side.

45. *To the Chairman.*—The back portions of these buildings are to be carried out in brick. All the men will have to come out on to the balcony in order to get into their bedrooms, and the balconies and verandahs are about 8 feet wide.

46. *To Mr. Gregory.*—It would be cheaper to widen the buildings and have an inside corridor; but it would not be so good for the men, especially sailormen. This plan also shows the drill hall, which is at the end of the road crossing the centre of the Parade Ground, opposite the petty officers' quarters. The size of this building is 165 ft. 9 in. in length, and 75 feet wide. There is an annex at one end containing a field-gun sited to contain four guns, an equipment room, a gunner store, and an armoury. At the other end there are offices for the General Orderly, the Master-at-arms, a kit storeroom, and lavatory accommodation for officers and men. The total length of the building is 209 ft. 3 in., and the total width 76 feet.

47. *To the Chairman.*—This building is the first of the wood and iron series with steel roofs. Seventy-five feet is a big span, and an enormous timber would have been necessary, while the steel is not expensive. I think this building is almost down to the last point of utilitarianism; and I only hope it will be considered suitable.

48. *To Mr. Gregory.*—There will be tar, concrete, and wood floors.

49. *To Mr. Finlayson.*—There is a range of lighting under the eaves on each side, extending 118 feet; and at the end there are large windows over the roofs of the annexes. In addition, the building is so very wide that we have put roof lights in as well, three on each side, measuring 6 feet by 8 feet; and there is continuous ventilation, with an open roof for 90 feet.

50. *To Mr. Fenton.*—I think we shall have the electric light there. The plan before us is not a standard plan, but I hope it will become so. Our drill halls are more or less on this principle, but we have not done anything so big as this before. This drill hall is estimated to cost £3,150.

51. *To Mr. Gregory.*—We are always doing work and getting tenders for work of a similar character. The drill halls run to £1,200 or £1,800, whereas this drill hall is, as I have said, to cost £3,150. Many dozens of drill halls have been constructed by tender, and we would not accept a tender unless we thought we were getting proper value according to our own estimate. I now have to show the Committee a plan of the drill and stripping battery; this is a building of similar class to the other, measuring 112 feet by 60 feet. It contains drill and stripping battery rooms, storeroom for mechanism, and rooms for the loading teacher. The actual drilling of the gun is conducted elsewhere. At any rate, it is a building of similar character to the last—wood frame and iron cover. This building will be extended three times the distance shown on the plan, which only indicates the beginning. The cost of this building will be £1,700.

52. *To the Chairman.*—The next building I have to describe is termed the "Shooting Battery." I understand that it is to be used as a building in which to train men to shoot, by means of dummy cannon. It will be of exactly the same type and constructed in the same way as the buildings I have just described; that is, it will be constructed of hardwood framing covered with iron, and will have a concrete floor and a steel roof. It will be well lighted and well ventilated. The length will be 126 feet, and the width 50 ft. 9 in., and the cost is estimated at £1,550. On the general plan there is drawn in

outline an extension which will make the building two and a half times as large as is now proposed; but that extension is a thing for the future. We know from experience that in all such buildings as these that we have been discussing, the allotment of the interior space is often varied considerably; and, therefore, to make this building as adaptable as possible, with as little cost as may be for alterations, the partitions will be carried up only 15 feet from the floor. This form of construction will allow a free circulation of air over the whole of the interior.

53. *To Mr. Finlayson.*—As the building about which I am now speaking will be erected on made ground, it will be carried on concrete foundations placed under the hardwood pillars supporting the steel roof. The natural surface of the ground will be covered in the filling-up process to a depth of 6 to 8 feet, and we could not depend on the made ground to support the weight of the building. On the plan which I exhibit, there is shown the general design of the building, with detailed drawings illustrating its construction.

54. *To the Chairman.*—I come now to what is described as the "Surgery." It is quite a small building, and not like the hospital, which will be on another site altogether, overlooking the sea. The surgery building will consist merely of a surgery, a dispensary, and a waiting-room for patients, and is intended to provide for immediate treatment in urgent or minor cases. The cost will be £350. For the sake of variation, we propose to create the building with weatherboard. Then comes the "Victualing Store," which will be on another site, and will be a large building, which are all very large buildings. The "Victualing Store" will be 142 feet by 52 feet, and will provide for accommodation for vegetables, beef, a cool chamber, a bulk store, and a room in which victuals will be served out to the ordies of the dock. The cost of the whole building, including the refrigerating chamber, is estimated at £1,800, and the construction will be the same as that of the other large buildings with which I have dealt. The next store is to provide for the storing of clothing, implements, &c. Its dimensions are to be 210 feet by 50 ft. 9 in., and it is to be completed in the first instance. It will contain accommodation for a shop and also a box store for clothing, implements, and mess-traps stores—which I take to be forks, and spoons, and plates, and dishes—a store for empty cuses, and condemned stores, a cooperage, and a tailor's shop. The cost is estimated at £2,700, and, again, it will be a building with a timber frame, steel roof, and concrete floor.

55. *To Mr. Finlayson.*—Ventilation will be provided at the top of the roof as well as under the eaves. There will be plenty of ventilation, but I think it better to err on the side of providing too much fresh air than too little.

56. *To the Chairman.*—The next store will accommodate inflammables, such as kerosene, petrol, &c. Its dimensions will be 53 feet by 32 feet, and its cost about £550. Roof, floor, and walls being of concrete. Then there will be a Naval Store of the same size as the Victualing Store, and of the same class of construction, and with the same general arrangements. It is to be used for the storage of hemp, canvas, cordage, yarn, flags, rubber and asbestos articles, electric torpedo and other apparatus, ship's cabin furniture, scientific instruments, brooms, brushes, brass, and leather. The cost will be about £2,700. In this case, again, the partitions will be carried up only 10 feet from the floor; but, to prevent access of any of the contained stores except by the doors, wire of a 6-in. mesh will be fixed between the

fors of the partitions and the roof. Thus there will be a free circulation of air, but the various storerooms will be absolutely separate. Possibly, the wire used will be electrically welded steel wire such as is used for reinforcing concrete. We do not wish to spend much money on work of this kind, but what we do must be effective for its purpose. Then there is to be a store for metal articles which is to cost about £2,800. This is about £200 more than the Naval Store will cost, but the increase is due to the fact that, for a third of its length, the store will be about 3 ft. 3 in. higher than the Naval Store, to enable travelling cranes to be provided for. The store is to accommodate angle- and bar iron, bolts and nuts, steel and brass tubing, copper, wire rope, anchor chains, cable gear, engine pumps, fire hose, lanterns, lamps, ironmongery of all descriptions, and tradesman's tools. Some of these things will be heavy articles, which could not be moved without the help of a crane.

57. *To Mr. Gregory.*—There is a tramway system which connects all these stores with the Receiving Store, to which goods are brought in the first instance by the railway.

58. *To Mr. Finlayson.*—The estimate of the cost of the Metal Store does not include the cost of the travelling cranes, of which there will be two, which between them will cover the whole width of that part of the building in which they operate, but it makes all provision for their instalment.

59. *To the Chairman.*—The next building to be described is the "Stationery and Condemned Stores building, of which it is proposed to build, in the first instance, two-thirds of the whole. This building will be 140 feet by 50 ft. 9 in., and will accommodate stationery stores, condemned stores, empty cases, fire bricks, lime and cement stores, and other goods. It will be of the same construction as the stores already described, and will cost about £1,800. I should like to draw attention to the fact that, considering the area covered, the estimates of cost which I have given are very low, and we shall be very fortunate indeed if we manage to construct the buildings for the sums named. Colonel Owen has a great objection to the making of estimates too high, because he holds that if a Department obtains more money than it actually needs, it will spend more than ought to be spent.

60. *To Mr. Sampson.*—The result of this economy is that we sometimes get hard knocks from the Treasury, because we find it necessary to ask for more money. We are never given credit for our savings.

61. *To the Chairman.*—I come now to what is called the "Receiving Store." It is alongside the railway line, and goods received in bulk will there be transhipped from the train to the tramways, and carried away to the buildings destined for their storage.

62. *To Mr. Finlayson.*—It is not likely that the tramways will be propelled by any system of electricity. There is to be plenty of labour to push the trucks. The Receiving Store will be 100 feet by 58 feet, and will cost about £1,700. There will be large platforms within this store, and framing will have to be provided for lifting machinery.

63. *To the Chairman.*—I direct attention now to the "Administrative Block," which is to accommodate the various heads of Departments, from the Commandant downwards. Each room will be separate, and the plan is that of an ordinary office. The building will be of iron, lined with wood, or with plaster, either of which would cost about the same. As the site is made ground, we could not

erect this building of brick. The cost will be about £25,000, but there is a good deal of interior subdivision to provide for. In view of the nature of the foundation, it would cost perhaps £4,750 to erect a brick building on the site.

64. *To Mr. Gregory.*—The suggestion that these buildings should be in wood is a good one. The contraction and expansion of the iron walls under varying climatic conditions would not be likely to affect the interior plastering, because it would take place without straining the timbers. The nail holes would provide the necessary givo and tallo.

65. *To Mr. Laird Smith.*—A wooden building would cost about the same as an iron building, and would be an agreeable variation of the general design.

66. *To Mr. Fenton.*—The danger of fire with a wooden building would not be appreciable. Besides, there would always be a large number of men to deal with any outbreak. The building is fireproof, and I see no reason why it should not be used in conjunction with weatherboard. We have so used it at Jervis Bay. The suggestion that weatherboard or fibrous cement should be used for this building is a good one, which I think we should adopt. It would not affect the cost.

67. *To Mr. Finlayson.*—Nineteen offices, and four strong-rooms are contained in the administrative building.

68. *To the Chairman.*—We come next to the "Guard Room," which I thought at first should be built of brick, but when I saw the site, I determined that it would be better to erect a frame building. This building is at the main entrance, and is to be used for the temporary detention of sailors who are intoxicated when they return from the town. There will be brick cells, and a brick wall enclosing the exercise yard, but the rest of the building will be carried out in timber. It will thus have the same appearance as the Administrative Building, and the use of timber will give more employment to carpenters. The Guard Room will cost about £1,100, the brick cells and brick wall increasing the comparative cost a little. My idea was to provide hardwood cells such as I have provided in many places in Queensland. I have never known a man to escape from such cells; but here they are not considered strong enough.

69. *To Mr. Finlayson.*—It would cost probably £500 more to construct the guardroom wholly of brick, because its site is made ground. I think that a design in timber sufficiently in keeping with the position of the building at the main entrance will be contrived. The cells and exercising yard will be hidden by the rest of the building.

70. *To the Chairman.*—I draw attention next to the "Boatswain's Store," which will be constructed of iron, and will cost about £700. Part of this building will be two stories high, the top story being open to the lower story, providing a loft. The whole building will be 42 feet square. The ground floor is to be divided into a boatswain's store, a rigger's loft, and a lay-out store. The upper floor will form the sail loft. There comes the "Torpedo and Mining School," which will be in plan something like the letter "U," with a long annex within the two wings. This building will provide classrooms for instruction in torpedo work and submarine mining. There will be lecture rooms, and rooms for practical demonstrations. Future extensions are to be provided for. The cost of the building will be about £3,300, its front being 122 feet long, the wings being respectively 128 feet, and 104 feet long, by 33 feet broad. Then there is to be a

"Stokers' School," about which I cannot give any particulars; but the building is not likely to be an expensive one; and a power station, boiler-house, and workshops, of which I have no information, although I understand that something very ambitious is intended. The various latrines will cost about £300. A small brick building 40 feet by 23 feet, to cost about £400, will be built to provide a painters' shop and a plumbers' shop. This building will be built of brick, because of the inflammable nature of the materials used by painters, and the possibility of fires spreading from the plumbers' shop.

71. To Mr. Finlayson.—It would be possible to separate the painters' shop from the plumbers' shop, but the plumbers' shop itself should be a very small place. I do not think that there would be any danger with fire if this building were constructed of brick.

72. To Mr. Fenton.—At Jervis Bay, where bricks were very dear, we made concrete blocks with local sand, but at the Flinders Naval Base there is no material with which to make concrete.

73. To the Chairman.—I think now of the "Boat-builder's Shop," and boat store. As the section shows, it consists really of two buildings, separated by a third, which is higher than they are. This building will be 228 feet long, the side portions each having a width of 35 feet, and the central portion a width of 16 feet. A tramway will run down the central portion, and a travelling crane will be provided to lift weights from the tramway into the shops. There is to be a machine shop to provide accommodation for lathes, hand-saws, planing machines, circular saws, and so on; a pattern-maker's shop, a carpenter's shop, and boat store, and a machine shop, which is to be used as a timber store temporarily. When it is required for use as a machine shop, a timber store will have to be built. There is also a boat-builder's shop, and another boat store. In addition to the three divisions of the building that I have described, there is a shed on one side of it 10 ft. 9 in. wide, and 142 feet long, which is covered by the overhang of the roof. It is to provide accommodation for masts and spars. The cost of the whole building will be £3,000.

74. To Mr. Finlayson.—The only exit from the boat store will be at the end of the building. Boats will be put on trolleys and wheeled down to the wharf. The building is at some distance from the boat slips.

75. To Senator Lynch.—It would not be practicable to bring the railway nearer to this building. It is necessary to have a general receiving store; and to alter the route of the railway would destroy the whole arrangement of the site.

76. To the Chairman.—There is also a magazine, which is to be constructed of brick, with a light roof which, in the event of an explosion, would blow off, and thus minimize the harm done. The walls will be hollow, and built with two 44-in. bricks. The dimensions of the building are 33 feet by 23 feet, and there will be a verandah all round. The air will circulate from beneath the verandah under the roof and over the top of the building, to keep the magazine as cool as possible.

77. To Senator Lynch.—The building will be surrounded with earthworks carried up as high as the roof. The Department has already constructed a number of magazines. Owing to the tendency of cordite to deteriorate when kept in a warm climate, there has been a considerable loss of money from deterioration, and Colonel Owen has, therefore, given the subject of magazine construction a good deal of consideration. At

Thursday Island we introduce cool air into the magazine, and provide for special ventilation as well; but at Brisbane we are relying wholly on the ventilation.

78. To Mr. Finlayson.—There will be a ceiling to the magazine, and a hollow space above it, and above that again the air will circulate between the building and the main roof.

79. To the Chairman.—The magazine will cost about £800, exclusive of earthworks. Then there is to be a wireless telegraph station, where the wireless communication of the base will be conducted. Its dimensions will be 39 feet by 29 ft. 6 in., and it is to be constructed of brick, I suppose, because of the delicate nature of the instruments, and to lessen dust and noise. The cost of this building will be £700, and provision will be made for a generating room, a high-tension room, a coding room, a receiving and operating room, a small workshop for repairs, and a small store for spares. Then there is to be a building in which instruction will be given in wireless telegraphy and signalling. In plan this building somewhat resembles the letter "U," and encloses another building. Rooms will be provided for the various classes in signalling and wireless telegraphy, and for other offices. The cost of the building will be about £3,500. There is no building of this kind on the same scale at Jervis Bay, but there it is not proposed to instruct so many persons in signalling and wireless telegraphy. We have also been asked to make provision for a house for the captain in charge, and other residences. The requirements of the captain in charge are very modest—a two-story house, which will cost about £3,300. That at Jervis Bay cost about £1,000. There are to be two houses for the senior officers—two-story buildings—costing about £1,700 each, and containing nine rooms, in addition to bathrooms, pantries, and cool store. They will have dining-rooms 20 feet by 14 feet, drawing-rooms 16 feet by 14 feet, and the biggest bedroom will be 14 ft. 6 in. by 13 ft. 6 in. We have been asked to provide two semi-detached two-story buildings for junior officers.

80. To Mr. Sampson.—In my opinion, it would be better to have each house separate. No doubt, the designs which have been submitted are merely typical, and it is to be expected that the need for accommodation of this kind will increase. I do not know how many buildings will be needed as residences, and I do not think that the Naval authorities are in a position to say what their requirements will be. No doubt, the Home Affairs Department will be allowed to use its discretion in the planning of these houses, and we shall try to arrange for having each house separate. We have been asked to provide two semi-detached, two-story houses for warrant officers. These would cost about £250 each in timber, and about £250 each in brick. I think that it would be better to build them in brick, so that all these residences might be alike in character. They will occupy a site near the railway station. The buildings which I have described are estimated to cost altogether £100,872, but that estimate does not provide for the gymnasium, the stoker's school, the power station, the boiler-maker's shops, work-shops, &c., Works Department's side bay, signal tower, and hospital. The gymnasium at Williamstown will be removed to the Flinders Naval Base, and that will not cost much. No doubt the power station will cost a good deal. I should like to commence the construction of the Seamen's Barracks there, given the subject of magazine construction a good deal of consideration. At

I cannot, of course, say when the Naval authorities would be prepared to enter into occupation of these buildings.

81. To Senator Lynch.—It is likely that the Naval authorities will retain their Williamstown property just as they have kept their Geelong property.

82. To the Chairman.—The stores and schools at Jervis Bay are on a smaller scale than that adopted for the Flinders Naval Base.

83. To Mr. Fenton.—The College at Jervis Bay is for the education of naval officers, not for the training of seamen, though a number of seamen have to be provided for at Jervis Bay, because their services are necessary for instructional purposes.

84. To Senator Lynch.—There are wooden buildings at Jervis Bay, and also buildings built of concrete blocks, which make good building material for one-story edifices, and are economical, when the concrete can be made locally.

(Taken at Melbourne.)

WEDNESDAY, 14th APRIL, 1915.

Present:

Mr. RILEY, Chairman;

Senator Keating, Mr. Finlayson,
Senator Lynch, Mr. Gregory,
Senator Story, Mr. Sampson,
Mr. Fenton, Mr. Laird Smith.

Rear-Admiral Sir William Creswell, First Member of the Naval Board, recalled and further examined.

85-86. To the Chairman.—The plans for the proposed buildings at the Flinders Naval Base, which have been submitted to the Committee by an officer of the Department of Home Affairs, have been before me, and have been the subject of discussion between the two Departments.

87. To Senator Story.—I am thoroughly acquainted with the lay-out of the proposed buildings as shown on the plan as approved, and regard it as satisfactory. The Department is quite satisfied with it. It is usual for the men on warships to mess and sleep in the same compartment. In the design for the men's quarters at the Flinders Naval Base that rule has been departed from, separate mess and sleeping rooms being provided. Curious though it may at first appear, I do not regard that as an improvement. I prefer our original plan, in which we provided for the men messing in the room in which they would sleep. I have given to this layout, however, as proposed by the Department of Home Affairs because I wish to avoid any further loss of time. We are anxious that the work should be pushed ahead. Our original plans were submitted some fifteen or eighteen months ago, so that these buildings should have been in progress last year, and their construction by now should have been well advanced. As to the opinion which I hold that the men should mess and sleep in the same place, I would remind the Committee that at those bases we have to get men ready for sea life, and that at sea there must be economy in regard to space and everything else. On board ship the men have to mess and sleep in the same quarters, and we wish to get the men at these depots ready as soon as possible to fit into such conditions. With proper care and attention, men can mess and sleep in the same

quarters and remain as healthy as if they had a room in which to sleep and another in which to eat or to use as a lounge. We take great care of the health of our men, and see to it that plenty of fresh air is provided. All the rules and regulations of the service are drafted on the basis of men on board ship being compelled to live in a comparatively small space, and men in training must be broken in, so to speak, in such a way as to fit them to live well and healthily in the confined space of ship-board. Nothing could contribute more to the inefficiency of a ship than to suddenly place on board a draft of sixty or eighty men who were entirely new to the conditions of life at sea, and who did not know how to lash up their hammocks, and to keep their quarters neat and clean. We want to be able to place men on board ship accustomed as nearly as possible to men-of-war conditions. It is quite true, as you say, that in the barracks for which this plan provides, the men will be required every morning to roll up their hammocks. It is the universal practice in all naval barracks that ship routine shall be observed. The men on a war-ship regard the mess-room as being practically their home, and in proposing that in these barracks the men should sleep and mess in the same rooms, our only desire was to preserve ship routine and to train the men, who will have to go afloat, in habits of order and cleanliness. The plan provides for a three-storied building, in which there will be a dining-room and a kitchen, which will ultimately supply the additional dining rooms to be erected later on. Our difficulty was to insure proper economy of kitchen space, and at the same time to feed a large number of men in such a way as to avoid the possibility of the food being served cold, or the men getting wet in reaching the dining-room. In the Defence Department's original plan we provided for covered ways, and for separate buildings to serve 100 men under conditions quite as good, so far as the actual cooking arrangements were concerned, as those for which this plan provides. If we had plenty of space, I do not see why we should have a three-story building, but the question of space has to be considered. In ordinary circumstances, I fail to see the utility of piling rooms on rooms. A bungalow building, with ample provision for ventilation, seems to me to be better suited for our purpose. At the sound of the bugle the men accommodated in a bungalow building could turn out very readily, whereas to accommodate them in a three-story structure seems to me to involve unnecessary labour. The question of cost is undoubtedly a vital one. The purpose of a depot is to afford men naval training—to enable them to acquire naval habits—and the nearer we get to that object the better, even if the cost be a little more than would otherwise be incurred. There is certainly something in your suggestion that a three-story building, with its attendant stairways for the men going up and down, will give them a taste of something like ship life, but now-a-days lifts are being placed on many ships. These stairways will certainly afford additional means of exercise. I am satisfied that the barracks are so designed that they can be easily cleared and well ventilated. Our regulations respecting ventilation are very strict. At sea, as soon as the hammocks are lashed up, everything that can be opened to allow of an ample supply of fresh air is opened up regardless of what the weather may be. Certain verandahs have been omitted from the design of the main building in order to allow the sun to shine as freely as possible into it. I am a strong advocate of buildings with verandahs all round them. In

this plan there is to be no verandah on the front elevation, but there will be one at the back, the object being, it is said, to allow the morning sun to shine freely into the dormitories. I consider it would be better to have a verandah right round, and to provide French windows running right down to the floor. I certainly attach much value to the admission of sunlight to the rooms, but with French windows in the building the verandahs could be so constructed as to allow of just as much sunlight as will find its way into these rooms under the accepted design. The question of cost has been considered. We discussed, first of all, the question whether the building should be of brick or wood. A wooden building costs less to erect, but at the end of twenty years a brick building would still be practically in its original condition, and the reduced cost of maintenance would have made up for the additional cost. The repairs to a wooden building are greater than in the case of a brick building. Considered only from the standpoint of cost, I prefer a wooden to a brick structure; but there would be a much greater risk in using wood for a three-story structure than there would be in using bricks. I cannot suggest any way of reducing the cost of the proposed building without reducing the accommodation. In that matter we are practically helpless. If we desire some work or building, the matter goes to the Department of Home Affairs, which supplies us with an estimate. We may think that estimate too high, but under the present system we have practically no voice in the matter. If we were carrying out our own works for ourselves, we should be keeping a watchful eye on the estimates expended, and it would certainly be our endeavour to see that the work was carried out as economically as possible. I am satisfied with the accommodation proposed to be provided for the officers. I do not think it is extravagant. There is one fault in connexion with the Jervis Bay buildings—it is only a minor one relating to the bath-room and latrine accommodation in the officers' quarters. A much larger proportion than is allowed in respect of an ordinary house to accommodate the same number must be provided. In the officers' quarters at Jervis Bay, where a fairly large number has to be accommodated, there are only two bath-rooms and one W.C. When I suggested that the accommodation was insufficient, it was told that it was in proportion to the usual hotel accommodation. But the position of officers at a naval depot is different from that of visitors at an hotel. We have, say, ten, fifteen, or twenty officers living by routine. They live, so to speak, by the sound of the bugle, and their services are called into requisition at a stated time. If all the visitors at an hotel were going to catch the same train every day, the lavatory and bath-room accommodation usually provided would have to be materially increased. Our officers have to be here and there at stated moments, and ample bath-rooms and latrine accommodation is necessary in order that they may lose no time. The arrangements at Jervis Bay in this respect will no doubt be improved. I do not think that the building of any of the structures for the immediate construction which the approved design provides could be deferred to a later period. The plan shows a complete design, but only certain buildings are at present to be erected. The principle we follow is to draft a complete scheme so that any portion now erected will fit in with the whole plan as finally completed. The whole matter has been carefully considered. The Naval Board appointed a special Board of three or four officers to draft our actual

requirements. They had before them the complete scheme, and reported what would be the minimum requirements of the Department. The buildings now proposed to be erected are in accordance with the report of that committee, and they must be erected to meet immediate requirements. They are all necessary for a naval base. We have cut down as much as possible the space to be provided. We have also in detail the interior fittings of these buildings—the interior of the gunnery school, the torpedo school, and the wiring school, as well as of the workshops and the wireless station. We suggest that the wireless station at the Flinders Naval Depot might very well take over the work now being done by the station in the Domain. It would lead to a saving here, and, at the same time, afford practice for our men. Putting the matter in a nutshell, I may say that I am perfectly satisfied with the arrangement of the building shown on the improved plan, that I think all the buildings for the immediate erection of which it provides must be erected, and that I cannot suggest any alteration that would mean an improvement. I have brought with me this morning a plan of the Portsmouth Dockyard, showing the additions made to it from time to time since the year 1640. I thought that this plan might be of value to the Committee in view of the statement that we sometimes hear that we are taking up more land than is necessary for the purposes of a naval base. We were advised by the Admiralty to make provision largely in excess of what our present requirements might seem to render necessary. The Admiralty gave us their own experience. They told us of the immense sums they had had to pay for land when they desired to extend the dockyards at Portsmouth, and the plan which I now submit shows clearly the additions made from time to time. In taking up land for dockyard purposes, we have to keep in mind the experience of the Admiralty, in that land can be obtained cheaply, it is well to acquire sufficient to meet all possible requirements. If it should prove ultimately to be unnecessary for our purposes, it can be sold, so that the country will not lose by the transaction.

88. To the Chairman.—In war time all wireless stations come under the control of the Navy. We have a wireless station at the Williamstown Naval Depot at the present time. It is linked up with the Commonwealth system, and is sufficient for our requirements in Melbourne. It is not the only wireless station in Port Phillip. There is another in the Domain, but that at the depot is for purely naval purposes. We propose, as far as possible, to transfer the machinery of the present wireless station at Williamstown to the Naval Base at Flinders, so that the only cost will be that of the building and the cost of the transfer.

89. To Mr. Laird Smith.—We are really making our own wireless instruments at the present time. We manufacture all that we possibly can for ourselves.

90. To the Chairman.—The purpose of the service is that Australia shall be made self-sufficient as early as possible, but the manufacture of torpedoes is a speciality. I was told quite recently that the Americans, notwithstanding their great skill, made failures of their first attempt to manufacture torpedoes. There are two or three main torpedo factories in the world. We have one at Woolwich and Whitehead's own factory is at Portland. No doubt we shall make our own torpedoes here at some future time, but at present we cannot do more than adjust and prepare them. We are

making provision in these new buildings for a torpedo repair shop, and that will be extended later on. The whole of the torpedo and machinery sections of these buildings have been restricted to one portion, but we have plans for extending them when required. The blacksmith's and engineer's shops, which we propose to erect at Flinders, are simply for repairs and renewals, not for manufacturing. The depot at Flinders is not a sub-base. It is a depot, and a destroyer and submarine base, a torpedo school for the instruction of torpedo men, and for torpedo training generally. This will be the only school of its kind in the Commonwealth. We think that, having regard to the climatic conditions of Westernport, we shall be able to get far more work out of the men, with much less exhaustion, than would be possible in any other part of Australia, taking the whole year round. Tasmania, of course, has a climate quite as good, but we think that Westernport is the best site for a naval depot and a training school, and the establishment there will always be our largest one. Port Stephens will be an excellent base for submarines and destroyers, and it will ultimately become a naval base. Such a project, however, is a long way ahead.

91. To Mr. Gregory.—The Department has a policy in regard to these matters. Admiral Henderson's report sets out the position very clearly. All the establishments for a sub-base are much less than those provided at a main base. The exact requirements for a base and for a sub-base are given at page 57 of Admiral Henderson's report.

91a. To the Chairman.—Admiral Henderson did not state that Westernport would be only a sub-base. He speaks of it in his report as a destroyer base and a submarine sub-base. We have only two main bases: the one at Sydney, the other at Cooma Sound. The buildings at the Sydney base are sufficient for the present.

92. To Mr. Gregory.—I was in error when I stated in evidence the other day, whilst dealing with the question of water supply, that there would be about 4,000 men in barracks at the Flinders Naval Depot; I should have said 2,052. That is likely to be the number in barracks, although the number for whom water will have to be provided is likely to be that which I originally stated. Plans were prepared originally by the Defence Department for the housing of our men at the Flinders Naval Base in a building of one story. We had alternative plans for brick and wood. It was estimated that a brick building would cost from 60 per cent. to 70 per cent. more than would a wooden building. The estimate of the Department of Home Affairs of the cost of a building for housing the men alone is £90,280. It is true, as you say, that the estimated cost of the buildings for which we are asking is about £250,000, but as to the suggestion that the cost of other bases will be still greater, I would point out that these buildings are not all to be erected at the same time. Their erection will extend over a considerable period. It is also possible that, as the result of the present war, there may be modifications of the complete scheme prepared by Admiral Henderson. We propose to have a power-house at the Flinders Naval Depot for electric lighting and general purposes. The estimated cost of the wireless station is £2,600. We have no wireless station at Jervis Bay. We have there a wireless establishment for teaching the cadets as part of their electrical course, but there is nothing in the way of a wireless school such as we have at the depot at present and shall have at Flinders. At Flinders it is proposed to train all the

wireless operators in wireless. It is not intended to have a wireless school at every depot. This will be the only wireless and torpedo school. The question of the store-rooms for which we are asking, and their internal fittings, has been considered by the Department. I think it is necessary that we should have several store-rooms, as proposed by us, rather than one huge store for the great majority of our stores. Special care is required, to begin with, in dealing with ships' gear, and very great care has to be exercised in the storing of explosives and ordnance gear.

93. To Senator Keating.—I have here an estimate of the cost of the necessary buildings in wood and iron, and also in brick. The estimate shows that brick buildings would cost 70 per cent. more than wooden ones.

94. To the Chairman.—You say that the difference would not be so great, but that is the estimate that was supplied to us.

95. To Senator Keating.—In this estimate all the figures have not been taken out in respect of the alternative designs for the various buildings, but where they have been the increased cost of brick buildings is shown to work out at an average of about 70 per cent. As to whether I think the buildings should be of brick or wood, my own consideration at present is the erection of the buildings with the utmost possible speed and with due regard, of course, to economy. The question of whether the efficiency of the buildings will be sacrificed to considerations of speed and economy depends upon the architect. I do not know of any naval barracks in other parts of the world that are constructed of wood. A characteristic of all English dockyards is the enormous solidity of all their buildings. I cannot say, as I have not visited them, that that is so of the dockyards of other nations. I have not visited the American or any foreign dockyards, but, judging by pictures, I should say that the Annapolis College is one of the most magnificent buildings, and that these we propose to erect will not cost a twentieth of the amount spent upon it. The Defence Department has decided upon a very economical design, and it will rest with other Departments as to whether or not that design is economically carried out. We are not proposing to make any fine architectural display, but, at the same time, we do not want to erect buildings that will be a positive eyesore. It would be dangerous to construct a three-story building wholly of wood, but the risk of fire would not be so great with naval men as with others. I do not think that the consideration of whether these buildings should be of wood or brick is vital. It is considered that the extra cost of a brick building will be more than saved in the course of twenty years by the reduced cost of maintenance as compared with the cost of maintaining a wooden structure. When the base is fully occupied by 2,000 odd men, I cannot say how many will be attending the wireless school, but I should think there will always be from twenty to thirty men going through it. The wireless men are rated with the signalmen. Every seaman to-day is becoming more and more a highly educated man, skilled in every sense of the word, and they are all taught signalling, though not all are taught wireless. As I say, all the men are taught signalling, and the best are drafted out for the wireless work.

96. To Senator Lynch.—The total cost of the erection of these buildings is, according to Mr. Murdoch, the architect, £124,000, and I do not think there is any margin of accommodation, though I cannot speak as to that right off. Captain Gordon Smith, who is one of the Board of

Officers, will be able to inform you on that point. The men's quarters, which are called the barracks, are to cost £31,000, and they will all be utilized at once, and I should say that the officers' quarters for single men, which are to cost £5,000, will also be fully occupied. In regard to the gunnery and training school, which is to cost £25,000, what is absolutely necessary has been taken of the original plan, and the remainder left for future extension. This building is a necessary one, and I think it will probably go on for some time without requiring further extension. There may be some room to spare in the meantime, but I would not say that the buildings could be reduced in consequence. If you want to give a man instruction in every kind of gun, you have to have every kind of gun, so that the same number of guns would do for ten men or 100 men. In twenty years' time, however, I should say that the building would require extending. The expenditure of £3,500 on the wireless telegraph station is most necessary. I think we may safely assume that the store-houses, offices, &c., which are to cost £35,000, are not going to be kept absolutely full, and there should be a margin for future extension, though it will be a considerable one, probably, before any additions are required to the stores. I think I have made sure that we have got sufficient land for our purposes at the base. I think that the whole place there, from a naval point of view, is a most valuable asset. I have already mentioned about its being a great place for exercising men, and I think we should never work out of them there, without physical exhaustion, than at any other part. We have a hospital site there, which, I think, in days to come will practically be the hospital of the whole Fleet. It is situated on a rise and in a generally healthy position. As to the proportion of men they will be drawn from this centre to fill up the personnel of the Fleet, I should say that about one-eighth of the whole will come from this base—that is, the total establishment there will be about one-eighth of the total of the whole Navy, the other seven-eighths being distributed over the other naval bases and the Fleet. We had just begun to arrange for the training of men in sea-planing at this base when the war broke out. We had already made requests that certain additions should be made in the home establishment to permit of our having instructors. We had selected a combined naval and military site for this purpose. The military officers selected a site near Point Cook, and, as I say, we were taking the first steps towards the training of men in sea-planing when the war broke out. We are making provision down there, in combination with the Army. This is a branch of instruction that can be more conveniently carried out at a naval base or close to it, and we should probably like to have it near our own place; but, in view of the small way in which this work is being done, we consider it more economical to have a combined school. Architecture is not one of my strong points, but I should be perfectly agreeable to live in a galvanized iron building or any other building so long as it fulfilled the purposes required.

97 To Mr Laird Smith.—The whole of the layout of these buildings is our work, and we put down the foundations, and did all the masonry work. We were not interfered with in any way by the Department of Home Affairs, to my knowledge. I really could not say whether it is possible, according to Mr Murdoch, to erect these buildings to accommodate the men at a cost of £30,213, or £14 per head, because I have had no experience of such matters, though I should be very pleased if that could be done.

98 To Mr. Finlayson.—As to the class of buildings shown on the plan, I can only say, in respect of them, what I wanted and what I thought was best. If the Department have brought reasons to show that their ideas are best, it is a matter that has already been settled. Ministers of Home Affairs and the Government have heard both sides of the question, and my idea is that what is best is to have buildings put up at once. I am not prepared to say that a three-story building will not supply our requirements, though I should have preferred a single-story building. I have never lived in a three-story building in my life, and I am only speaking of what is my personal preference in the matter. I can only say, as I said before, that a one-story building seemed to us to fulfil our requirements. I am willing to agree to the erection, as an experiment, of these first two buildings suggested as barracks, and to leave the question as to the erection of the later buildings to be determined by the result of that experiment. I am the more inclined to the experiment because I think that the Home Affairs Department will supply our requirements more quickly. An objection of mine to the barracks at present is that I should like to see the verandahs go all round. As to the reason given by the Director-General of Works that, in view of the habitual holy-stoning and washing of the decks or floors, the sun is necessary to prevent dampness, I may say that in this regard the Navy has moved with the times. The decks of many ships are covered with linoleum and other compositions, and holy-stoning is going out a good deal, and in all probability it will not prove part of the routine. Now-a-days they even cover the decks with lacquer. As I have already said, architecture is not my strong point, but for the sake of preference I would sooner fall on wood than on stone. I suppose it is a principle in architecture, as in everything else, to use the least material that will effect your purpose, and less wood will be required than stone. For the men's barracks I should have wooden floors of the closest possible grained wood. I should have them covered with lacquer, linoleum, or some other covering. I have been in a ship where the softwood decks, with the scrubbing every morning, were rarely dry, and I had them covered with linoleum. I do not support the objection to the verandahs being placed all around because of any need for drying the floors by means of the sun. As to any difficulty there might be in marshalling the men in one building, but I should prefer the former, because then there is better supervision, and so forth. I regard 100 men as the unit, but it is a matter of preference. I am satisfied that there is sufficient space provided between the buildings along the low level to obviate any fire risks; I think the distances are sufficient to localise any fire. As to what buildings on the list are most urgent, I should put up the barracks and also the drill halls and officers' quarters; in fact, what we really want is the transfer of the Williamstown establishment, and that means practically every building on the list. I want all the buildings to be proceeded with simultaneously—so that we can move *en bloc* from Williamstown. The bathroom accommodation in the officers' quarters seems to be the main thing, and officers have spoken to me about it before. There are six officers' bedrooms with only one bathroom, and the same possibility prevails on the other side of the building, and this accommodation, I think, is on the small side.

99 To Mr. Fenton.—We can never tell when it may become urgent that we should leave Williamstown. We are now over the time that was agreed on between the Federal officials and the State officials, but I suppose that the war has obstructed everything. I feel that we ought to be in a position to show the State authorities that we have, at any rate, been making every effort to get out. We must go away from there—it is not a case of choice on our part. The gunnery schools and so forth will have to be placed somewhere and naturally we should like them at the Naval Base. There is a possibility of the wireless telegraph at the base reaching over twice 3,000 miles—that is, it is guaranteed to send 500 miles by day, and double that distance by night. These distances, however, are the distances you can make sure of, and does not mean that it is limited to that range. You can go further and further, with signal gradually weakening, to a much greater distance. We were asked by the local station here, which could not make itself heard, to speak to a ship north of Brisbane, and we were able to do it. We propose to have a 500-mile range at the Naval Base, and we will transfer the plant from Williamstown. With the present equipment at the torpedo, gunnery, and other accommodation at the base, we could never go on when we get the Fleet back and into full swing. As to the number of men to be accommodated, and so forth, I should like to refer you to Captain Gordon Smith, who has these matters in his special section.

100 To Mr. Sampson.—Captain Gordon Smith was the officer of the Defence Department in consultation with the officers of the Home Affairs Department respecting the buildings. I think that an official staff of 1,000 is all we shall have to provide for now, with the men under training, and, perhaps, a ship or two. As to whether an expenditure of £50,000 a year is justified for the requirements of 1,000 men, I speak, of course, from the point of view of the expansion of the Fleet.

What I have said represents, in my mind, what we should like to have and what we shall try to get. We can give the Committee, through Captain Gordon Smith, an idea of the minimum requirements for the next two or three years. We can tell you what we should like to have, but, of course, what we shall get is a matter for you, gentlemen. I may say that I have no fault to find in this regard.

101 To Mr. Fenton.—When we get there I do not think there will be many labouring men on the wharves, distinct from the naval men; they will be practically all service men; there is no provision for housing labouring men of that class.

102 To Mr. Finlayson.—Admiral Henderson recommended that Sydney should be the naval depot, with gunnery, signalling, wireless telegraph, and other schools, and we are proposing that there shall be such schools at Westernport, and also what we call the schools at both. We shall certainly not have them at the present place, but we are going to have them at the place then at Westernport, and that without in any

way infringing the spirit of Admiral Henderson's advice. Admiral Henderson is rather contemplating the whole Fleet being at its maximum development, and it will be many years before we are up to that. It is better to have those schools all at one place, under one supervision, and in the meantime, the best place is at Westernport. The recommendation in regard to Sydney will not be followed for some considerable time—not until the Fleet requirements become so great as to make it necessary.

103 To Senator Story.—There is no doubt that units of 100 men could be accommodated on each floor, and, as I have said, I regard that number as about the limit. You can have a club or a mess of 100, and this means a certain amount of camaraderie, but any more begins to be too large. I like the smaller number from the social point of view as well as from other points of view. There is no doubt there can be supervision over men on different floors, just as well as on a single story.

(Taken at Melbourne.)

THURSDAY, 15th APRIL, 1915.

Present:

Mr. RILEY, Chairman;	
Senator Keating,	Mr. Finlayson,
Senator Lynch,	Mr. Gregory,
Senator Story,	Mr. Sampson,
Mr. Fenton,	Mr. Laird Smith.

Captain Arthur Gordon Smith, Second Member of the Naval Board, sworn and examined.

104 To the Chairman.—I am familiar with the class of buildings proposed to be erected at the Flinders Naval Base. To a certain extent I went through the plans in conjunction with the Home Affairs Department, and ultimately agreed with that Department concerning them. In company with Commander Stevenson, who is in charge of the Naval Depot, and Mr. Fanslow, the Naval Works Director, I went to Westernport to examine the site, and we submitted a scheme of single-storied buildings for the officers and seamen generally, because, in view of the area available at Westernport, it did not seem to be necessary to have buildings erected of more than one story, have buildings erected of more than one story, and also because the seamen, particularly the older men, who have lived on board ship, get into the habit of living in a mess, where they have all their property and their mess gear, hammocks, and boxes, and everything, all complete in one room as they do on board ship, and therefore it was desirable to get the younger men into sea habits. That was one of the main reasons why we proposed to have all the men mess together. Of course, sleeping rooms are easily converted into mess rooms by stowing away the hammocks, and the men go through the routine of scrubbing the such like more than is done in similar shore establishments—that is, the decks are washed every morning—therefore the question of cleanliness when eating and sleeping in the one room does not apply. Seamen do all this on board ship, where cleanliness is absolutely necessary in order that the men may live in comfort, and they would be considerably more crowded in a ship than they would be on shore at Westernport. However, the Department of Home Affairs objected to our proposal for one-storied buildings; they said that it was not desirable that men should eat and sleep in the same room, and they pointed out that the men would not get the amount of cubic space

that was legally desirable. The objections raised by the Department of Home Affairs were upheld by the Minister, and that Department brought out a scheme for erecting three-storied buildings. There are certain advantages in three-storied buildings. For instance, the work of sewerage and water supply is greatly simplified, as there is not so much ground to reticulate; also the cooking arrangements can be more easily organized. All the cooks can be situated in one galley, which is an advantage from a naval point of view, seeing that a cookery school must be established as well as anything else. To have these young cooks in different buildings would not be desirable. They should be in one establishment. From that point of view, the proposal of the Department of Home Affairs was advantageous, but their proposal to have one big dining-hall for the whole of the men, about 700 altogether, was contrary to our scheme of training. It was more like a prison arrangement. The proposal was that all the petty officers and seamen should mess together. Such a system would not be in accordance with naval custom. The petty officers, being of superior rank, are entitled to separate accommodation, and owing to my representations the Department altered that scheme, and arranged to have dining-rooms to accommodate about 100 men each, which scheme I said would do. At present we are content to have the three-storied buildings, but if the dining-room arrangement does not work, depend upon it, the Captain of the College will arrange to have the rooms used for sleeping also used for messing—although having to carry the food up stairs will be awkward—and he will put to some other purpose the dining-rooms at present arranged for. The buildings now proposed will suit our requirements. The committee which was associated was told to submit a scheme of buildings to replace those now in use at Williamstown, and that is all we did. The depot at Williamstown is very congested, several things have to be done in one room, but at Westernport the buildings have been spread out to some extent. Of course, we could get on by merely rebuilding the structures now at Williamstown, but I do not recommend such an extreme course. I was Commander of the Naval Depot at Chatham, where 4,000 men are accommodated in three-storied buildings in an area about a quarter the size of that allowed for at Westernport. There was no manufacturing in the Chatham Naval Depot, but every morning a large number of the men from the barracks went to the dockyard adjoining for instruction in fitting, and that sort of thing. At Westernport we propose to carry on only the necessary repairs, but my suggestion is that repairs to destroyers and submarines should be executed as part of the training at Westernport. This would mean, to a certain extent, a duplication of the plant at Cockatoo Island and Garden Island, but in the event of an enemy flying base being established in the Bass Strait and Banks Strait for the purpose of intercepting Australian trade, a submarine base at Westernport, where submarines or destroyers could go in to have repairs effected would be certain advantage to the Navy. The works would be 7 miles from the sea, and as the range of the guns of a Dreadnought is about 10 miles, they would not be immune from attacks by enemy ships; but if there were a fort at the entrance, the enemy ships would have to fire at a very long range, or render themselves liable to be sunk by even a small gun stuck on the top of Flinders Peninsula. Westernport is a very good harbor, suitable for naval purposes. The proposal is to transfer the men now at Williamstown. I understand that, according to an

agreement with the State Government, we were supposed to vacate the Williamstown depot in February last.

105. *To Mr. Laird Smith.*—The work of training at Williamstown could be carried out more efficiently if it were carried out under conditions such as we will have at Westernport. Therefore, the sooner we get to Westernport the better it will be for all concerned. Owing to the limited area at Williamstown, the training is very inadequate. There is no parade ground, and there can be no training in skirmishing. There is no battery of guns, and as the torpedo school is poked away in a little corner, there is practically no means of giving instruction in torpedo work. The question of what machinery shall be installed at Westernport, and what work shall be carried out, is still under consideration. Repairs are often as important as construction work. The point under consideration is whether Westernport shall be capable of dealing with all repairs to destroyers and submarines, or whether it shall deal only with things that can be done there conveniently. The work of making the equipment for a wireless station, which is of a highly technical nature, is now in hand at Williamstown. Personally, I have nothing to do with the location of the buildings at Westernport. That matter was practically arranged before I visited the place, and when I saw the sites chosen I concurred in them.

106. *To Senator Storr.*—I do not anticipate that the dining arrangement will prove unsatisfactory, and that the men will ultimately mess in their sleeping quarters. To do so would be very inconvenient with a three-story building if men had to carry their food to the top story. Naval men are fairly adaptable, and they can adapt themselves to the new scheme submitted by the Department of Home Affairs; but I do not recommend it. The difficulties to which I refer do not occur in regard to the three-storied buildings at Chatham Naval Depot, because there the cook's galley is situated on the second floor of a block which stands midway between the two blocks occupied by the men, and is approached by communicating gangways. I appreciate the extra expense that would be incurred in regard to the sanitary arrangements required for a number of small one-storied buildings scattered all over the place, though I do not know what it would amount to, and I gather that this additional cost was one of the objections the Department of Home Affairs advanced to our scheme. I also suppose that a three-storied building will provide accommodation at a cheaper rate, because one roof will cover three stories, but possibly more substantial buildings will be required. I think that the method of communicating to men proposed by the Department of Home Affairs is quite satisfactory, but I do not propose that it should be altered, though I think that the men would prefer one-storied buildings with messing and sleeping accommodation together. They are accustomed to that system. "They like their little hut. You can say to them, 'That is your job, and you have to look after it'; and if that window is broken I you can fix the blame for it; but when a window is broken in a long passage used by every one, no one is responsible. The Naval Department are anxious for the Department of Home Affairs to get on with the work, and do not want the lay-out altered at this juncture. It is over a year now since I went down to Westernport to see the place arranged, and I believe that the question originally started two years ago, before I came to Australia. I understand that the Department of

Home Affairs have recently had men available from Jarvis Bay, and that these men have now been sent to work at Westernport.

107. *To Senator Lynch.*—I do not know of any pressure having been brought to bear by the State Government to shift us from Williamstown, but I believe that the Commonwealth Government informed the State that we were going to leave there. I understand that the State Government are content that we should remain, providing that something is done to show that we shall be shifting shortly. The greatest reason for leaving Williamstown is the desire to secure greater accommodation and room for the men generally, and because the Williamstown depot cannot be extended another inch, whereas shortly we shall be having more men in training. In fact, we shall have to stop recruiting, because there is only room for another 80 men at Williamstown, in addition to the 300 men already there. Our work is hampered by our remaining at Williamstown. The location of the buildings at Westernport was originally done by Mr. Fanstone, who represented the views of the Naval Department on the matter. The location of the buildings meets our requirements. I was not consulted originally, but when I went to Westernport, Mr. Fanstone, who had already prepared the plans, pointed out the sites, and explained the reasons for each particular building, and I concurred in his proposals. The plans were designed with certain reasons. The stores are close to the water's edge, and the living buildings are on the highest part in order to get more air. I would not wish to have the arrangement for separate eating and sleeping rooms altered now. I prefer one-story buildings, but as it has been pointed out that a considerable amount of expense is saved by erecting three-story buildings, I am content to take them as they are designed. There are three-story buildings at Chatham, but I prefer one-story bungalows, because we have more room available at Westernport. In the case of the barracks at Chatham, they had to economize in space. Part of the site was dug out of the side of a hill. The buildings are squeezed in between a road belonging to the town and the dockyard, and a convict prison had first to be cleared away. When I speak of more room for the men, I mean a greater area. There will be a recreation ground in front of the buildings at Westernport, which will be sufficient for our purposes. If there had been more room available at Chatham, I believe they would have had single-story buildings. Single-story buildings are not the custom in Great Britain, because places there are more congested. I do not think that three-storied buildings will hamper our operations to any extent, and I do not advocate any alteration, because any such alteration would mean further delay. I do not object to three-storied buildings on the score of the men having to climb three stories to their sleeping accommodation. The men are sufficiently active for that. It is proposed to spend £20,000 on gunnery and training schools, where instruction will be given in regard to ammunition, fire control, and the theory of gunnery. Instruction in fire control is given in school rooms. There will be also batteries which carry heavy guns, such as will be used on board ship. They do not actually fire heavy shells, but they fire air rifles, fixed on the guns. Training is also given in firing at moving targets, and in the use of machine guns and field guns, which work is carried out on the parade ground, or

in the drill hall during wet weather. Instruction will be given in range finders, telescopic sights, adjusting sights, and all sorts of sights. In fact, the instruction given in the depot will cover every sort of gun in use in the Navy except the 12-inch gun, the training for which can only be given on the *Australia* at the present time. The final establishment will be something like 2,000 men, but I understand that the expenditure of £20,000 for gunnery and training schools only applies to present requirements. The buildings can be added to from time to time as required. A sum of £35,700 is estimated to be spent on stores and offices. A large quantity of stores must be stored. We would store more at Williamstown if we could. The buildings to be provided are iron-framed. I do not think it is proposed to remove any of the buildings now at Williamstown. The sum of £35,700 will, I think, barely provide for the present requirements in regard to stores and offices. A large quantity of stores will need to be kept for the ships if they are to go into Westernport generally.

108. *To Senator Keating.*—I have been in the service of the Australian Navy for two years, and I am not very familiar with the arrangements between the Commonwealth and the State Government in regard to the Williamstown property. I say that there has been no pressure on the part of the State Government to get the Commonwealth Government to quit, but occasionally the State Government have asked us to quit, and an arrangement has been made by the Commonwealth to quit as soon as possible. We have been using for outdoor training a piece of land at Williamstown belonging to the State Railways Department. I do not think it is anything more than a private arrangement. There has been no correspondence about the matter. The Railways Department do not require the land, and we are doing no harm by drilling on it. I do not object to the provision that is being made for accommodating the men in three-storied buildings on the ground of its inadequacy, or because the men will not have sufficient cubic foot of space. The provision in this regard will be the same as that allowed to shearers, and, as a matter of fact, there would be less air space provided in the single-storied buildings. My preference for the latter buildings is that we shall have more land at Westernport than is available in my corresponding depot in Great Britain, and therefore we had the opportunity of doing what could not be done at Chatham. The gunnery school referred to consists of five buildings. The range-finding instruction will be given in the lecture room. It is now given at Williamstown, in the drill hall. There are certain appliances used in giving instruction in range-finding, but the principal instruction given to the officers and men is in regard to the control of gun fire. It is difficult to extemporize in giving this instruction. You have to make all sorts of arrangements which are difficult to explain. Appliances are needed for giving the men practice in firing at floating objects and in allowing for the roll of the gun. You roll the target, and it represents a floating object. The dimensions of this building will be 120 feet by 50 feet. It will contain guns of the different types, and is only one building out of five which comprise the gunnery school, and which will cost £20,000.

109. *To Mr. Stampson.*—It is necessary to go on with the whole of the building outlined by Mr. Murdoch; otherwise we shall have men at the depot with nothing to do. We must provide

for the instruction of all the different classes of men as soon as they are transferred to Westport. There will be the wireless school, the signalmen, the torpedo ratings, and men training as divers, and men training for gunnery. Each group must have instruction in connexion with his own particular job. All buildings coloured on the plan have been arranged for the accommodation of the men now at Williamstown. Mr. Murdoch's estimate of £124,000 is for those buildings coloured on the plan. They will all be required. It will not be necessary to proceed with the full scheme, because I do not anticipate that there will be more than 1,000 men there at any time within the next two and a half years. I made out a report as to the absolute requirements for the next two and a half years, and my report covers the buildings coloured on the plan, which, as I say, will be sufficient to allow us to transfer the men now at Williamstown. I anticipated that a start would have been made before this, and that the buildings would have been completed within eighteen months, which period would expire in September of this year. The buildings shown as coloured on the map are those which the Department of Home Affairs and the Defence Department are agreed should be pushed on.

110. *To Senator Story.*—The plan before the Committee gives effect to my report.

111. *To Mr. Sampson.*—Mr. Fanstone made an estimate that these buildings would cost about £308,000, but the Department of Home Affairs cut down the estimate to £124,000. Mr. Fanstone's estimate included a hospital, fencing, roads, water, railway, tramway, and sanitary services that have not been included in the work to be put in hand at the cost of £124,000.

112. *To Mr. Gregory.*—Mr. Fanstone's estimate did not include a power house. I cannot give any idea of what will be the final cost of the buildings. An estimate was prepared by Mr. Fanstone, but I do not know what the figure was. I can get the information as to our estimate of the final cost of the completed scheme, and of the proportion of that scheme which should be gone on with now.

113. *To Senator Story.*—The plan before the Committee is for the completed scheme, but only the portion coloured is needed for the present requirements. The buildings outlined on the plan, and not coloured, are for future additions, which, so far as we can guess at the present time, will meet the requirements of the full complement of men that will be at the depot.

114. *To Mr. Sampson.*—I assume that the total cost of the completed scheme will be about double £124,000—that is for the buildings. There is no provision for detention quarters, which are very necessary. I shall try to get the Department's estimate of the total cost. A vessel 7 miles off would expend far more in ammunition than would do damage to the barracks. If she hit the building she would knock a hole in it, but the rest of her ammunition would probably be spent on the parade ground, so that the shelling of an establishment of this sort would be a waste of ammunition. Of course there will need to be a fortification to keep an enemy ship out of the bay. Westport is as safe a port as is Portsmouth.

115. *To Mr. Fenton.*—All the land required by the Commonwealth at Westport is shown on the plans, though to acquire more for a rifle range

may be contemplated. I have not seen what barracks accommodation is provided in Germany. I understand that the State Government are anxious to build a dock on the site occupied by our Williamstown depot. I do not know why balconies have been omitted from the design of the buildings at Westport. A verandah is very desirable in our climate, especially in the summer. The men use it as a smoking room.

116. *To Mr. Gregory.*—In regard to future extensions, a large expenditure now necessary on electric lighting and sewerage will not have to be repeated. The provision of a number of stores is in accordance with naval custom. On board ship naval stores are not in the hands of one store officer. The boatswain has control of the boatswain's stores; the paymaster, control of the paymaster's stores; and the engineer, control of the engineers' stores. And then there are gunners' stores and carpenters' stores, each being in charge of its own particular officer. The same system will be applied at the depot. The gunner will have control of the gunners' stores—material for cleaning guns and that sort of thing. The paymaster's stores consist largely of provisions and clothing, which could not well be mixed up with paints and oils. To have the stores in separate departments, each in charge of its own officer, is more suited to the naval system. Of course a boat may only come in once a year, but there will be a stores officer in charge of all ships' stores. The paymaster's store will be a small place where the clothing and provisions will be kept for the establishment itself, and not for victualling ships. Our estimate for one-storied buildings exceeded the estimate for three-storied buildings, but I believe that Mr. Fanstone said that the estimate of the Department of Home Affairs in regard to the three-storied buildings was under the mark.

117. *To Mr. Fenton.*—I do not think that either the Naval Department or the Department of Home Affairs intended to put up anything but iron buildings on the made-up ground.

118. *To Mr. Finlayson.*—The stores provided for will not be greater than needed to meet immediate requirements. They were designed by the stores officer at Williamstown, and have already been pruned down to the barest necessity. To a certain extent there is a disadvantage in having bigger buildings, each accommodating 300 men, but I do not think there is much importance in that point. I do not anticipate any increased difficulty in handling men because there is a large number of them in the one building. Of course, having them all on the ground floor makes it easier for the men to answer the bugles and turn out on the parade ground, and also for the officer going his night rounds, but I do not think that is a serious objection, and I only mention it as an instance.

119. *To Mr. Sampson.*—The question of how far the workshops are to be extended, and whether there is to be a floating dock at Westport, has not been settled, but I shall endeavour to get the departmental estimate for a depot to accommodate 2,050 men.

120. *To the Chairman.*—Around the coast of Australia fourteen bases are provided for in the Henderson scheme. I do not know whether the Port Stephens base will be carried out.

121. *To Mr. Gregory.*—I think that the expenditure of £1,000,000 should cover the cost of the sub-base at Elnders. It might become a Portsmouth in 50 years, though I do not think it is the best place for a Portsmouth. I think Port Stephens is the better place.

(Taken at Melbourne).

TUESDAY, 20TH APRIL, 1915.

Present:

Mr. RILEY, Chairman;

Senator Keating,	Mr. Finlayson,
Senator Lynch,	Mr. Gregory,
Senator Story,	Mr. Sampson,
Mr. Fenton,	Mr. Laird Smith.

Peroy Thomas Owen, Director-General of Works, Department of Home Affairs, sworn and examined.

122. *To the Chairman.*—I have seen the statement sent in by Captain Gordon Smith, referring to the buildings, and I think it practically covers all that will be required, but other small supplementary buildings may be necessary. I take it that there will be a refrigerating plant, a plant for electric lighting and distribution, water supply, reticulation, and sewerage. All this will cost a considerable amount of money. Then there will be the expenditure to be incurred in road-making, for roadways are an accessory to the building project. Mr. Jeffrey, the resident engineer, told me yesterday that he had made a start with the erection of one of the barracks, with a view of pushing on with the work, and providing employment, which I take it is the desire of the Government. As far as not much has been done, and if the Committee think there is a possibility of a change being made, the work can be stopped. I think some of the members of the Committee have expressed the view that the offices should be in brick instead of galvanized iron. That would be an important point to settle as soon as possible. If that point has not been settled, it will enable us to make a start on some of the officers' quarters, and I would like to do that. These buildings would be convenient for the resident engineer and other officers. The present proposal is to build the administrative offices of iron.

123. *To Senator Story.*—The land on which it is proposed to build the administrative offices is "made" ground.

124. *To Mr. Finlayson.*—The administrative offices would cost about £2,600 in timber, and about £4,000 in brick, with all accessories. That is a very rough approximation. It is the proposal of the Department to erect the buildings of wood and iron. If erected in brick it would be expensive, because we would have to secure the necessary foundations by piling.

125. *To Senator Story.*—In this particular case, for utility, I would recommend wood and iron for the administrative offices, that is using jarrah weatherboards on ordinary hardwood framing, and lining with Tasmanian stringybark with fibrous cement ceilings. This would make a comfortable building of good appearance.

126. *To Mr. Finlayson.*—It would be necessary to construct the strong-room of concrete.

127. *To Senator Lynch.*—A wooden building of superior construction should have a life of from fifty to sixty years. It would be expensive to carry concrete foundations right through the "made" ground for a brick building. A little while ago the resident engineer put down a few holes to investigate the "made" ground, and found that in places it was still so soft that you could push a crowbar through it. The simplest thing to do would be to pile it according to the load of the building. This course would not be very

expensive, because the load would be small. As I have said, under the circumstances I would put up a well-framed building, sheet it with weatherboards, and line it with Tasmanian stringybark, with fibrous cement ceilings, and an iron roof. Even then a considerable amount of piling for the strong-rooms and chimneys would be required. I do not know that I could make any other suggestion concerning the proposed lay-out of the buildings. I did object to the original plan for the lay-out, and that was modified. I would not now suggest any modification of the plan as laid before you, and which I presume has been laid out to meet the needs of the naval authorities.

128. *To the Chairman.*—The administrative block should be in the most convenient position in relation to the other buildings. In the circumstances, I do not know that I can make any suggestion to vary the lay-out by placing the administrative block on land which would carry a brick building.

129. *To Senator Lynch.*—No estimate has been prepared by the Home Affairs Department for the complete block of buildings. The various buildings mentioned by Mr. Murdoch, and totalling £124,000, is as far as we have gone. I think the Committee should have a complete list of the buildings.

130. *To Mr. Gregory.*—I have never had a complete list of the buildings required by the naval authorities.

131. *To the Chairman.*—The sewerage is an important point, and ought to be proceeded with at the same time as the buildings.

132. *To Mr. Gregory.*—I notice Captain Gordon Smith's statement covering buildings, to the total value of £459,680, which, with contingencies, 10 per cent., brings the total up to £505,850.

133. *To the Chairman.*—That proposal has never been before our Department. If the Committee direct me, I will go into the matter and examine the items. This is the first time I have seen the statement.

134. *To Mr. Gregory.*—Speaking from memory, I cannot say what buildings were provided for in the first place. It is, however, a progressive scheme, and intended to provide eventually for 2,000 men. I cannot say if I agree with Captain Gordon Smith that the buildings would involve about £500,000, as up to the present I have not seen the complete list of what the naval authorities want.

135. *To Senator Lynch.*—Some time ago there were alternative proposals for a galvanized iron or brick structures, and there were original estimates given then by the Naval Works Branch. I agree that there should be a complete schedule of buildings required for the naval authorities.

136. *To Mr. Laird Smith.*—I think we have kept well within the estimates of the naval authorities in the buildings we are putting up.

137. *To Mr. Finlayson.*—The naval authorities prepared the plans for the original scheme, but there was a difference of opinion between the two Departments as to what should be done. We decided upon a three-story building for the barracks.

138. *To Senator Keating.*—Mr. Fanstone represented the Naval Department. I believe he is now in Western Australia. I am not prepared, but to say that Captain Gordon Smith's estimate would be accepted by us as the constructing Department.

139. *To Mr. Sampson.*—It includes wharfs and other buildings that do not come under my Department.

140. *To Senator Keating.*—The No. 1 scheme mentioned by Captain Gordon Smith, totalling £222,000, refers to the naval training establishments, and the No. 2, for £137,000, refers to offices connected with the dockyard. The first item includes barrack and other buildings to be erected under the £134,000 that is now on the Estimates. I am not clear as to how much of the construction under the £124,000 falls within Captain Gordon Smith's second item; but I know that some store buildings are to be erected under the present vote. I observe that the items mentioned in Captain Gordon Smith's statement, referring to a total of £226,000, total only £190,000, and that allowing 10 per cent. for contingencies, the total should be £209,000 as against £248,000; but I cannot say if any particular item has been omitted. It appears to me, however, that £20,000 for dredging will not cover the necessary work. I might point out that the No. 1 scheme—£228,000—does not refer exclusively to the first programme of works; it includes, however, all the barrack portion of the project. The first and second propositions, namely, the barrack and dockyard portions of the work, will go on simultaneously. The total shown on the plan for buildings alone, according to Captain Gordon Smith's statement, is £206,000, and I understand that estimate is to cover all the requirements of the naval authorities. The footnote to the statement points out, however, that the figures are approximate only, and that the actual list cannot be supplied until the complete requirements are definitely known. The proper course would be to require the naval authorities to produce a schedule of all the buildings required—not necessarily the plans—giving the approximate size of each building, and notes as to the construction of each. This should be supplied to the Home Affairs Department, and on such a statement I would be prepared to give an estimate of the cost. If the Committee desired it I could get a statement from the Naval Department, and work out a rough approximation of what the cost would be.

141. *To Mr. Sampson.*—The power plant has not been referred to us, and I understand the naval authorities do not propose that it shall be referred to the Home Affairs Department, as they will do that work themselves. It will be a fairly heavy item.

142. *To Mr. Gregory.*—They may not require labour-saving and fuel-saving plant such as is provided for the Capital City.

143. *To Mr. Sampson.*—The scheme submitted by the naval authorities to the Home Affairs Department should be a complete one, and it will be in the interests of the Department if this is obtained. I never like to submit to the Minister a proposal for a sum to go on the Estimates unless I know what the whole proposal is. It is not fair to Parliament either. In connexion with the erection of the naval and military colleges we did not know what the full requirements would be. We have already completed the original list of buildings for the naval college, and we are now putting up quarters for twenty or more married men, because it is found that married instead of single officers are predominating in numbers; such could not, however, have been foreseen. There is another matter which should be taken into consideration, and that is the question of adding 20 per cent. to the cost of buildings for unforeseen expenditure during construction.

144. *To Senator Story.*—The block plan before the Committee shows the lay-out of all the buildings now required, but there are several buildings

for which we have no building plans at all, and as the matter stands now I could not give an estimate of the total cost of the scheme. With regard to the power-house I could not give an estimate. The original plans provided for a steel-frame lofty structure—an expansive building. I do not know whether this has been modified. The site of the building is shown on the block plan, but we have not yet been able to go into the matter.

145. *To Mr. Finlayson.*—I could provide the Committee with an estimate for any of the ordinary buildings shown on the plan. But there are other buildings such as the power-house, torpedo school, &c., and which I could not give an estimate.

146. *To Senator Story.*—I could furnish an estimate of the probable cost of the buildings in respect of which we have details, but you would be no further ahead than you are now, if important portions were left out. I presume the Committee want a comprehensive estimate of everything that is to be erected.

147. *To Mr. Gregory.*—In my estimates for the brick building for the administrative offices I had the detailed quantities taken out and estimated on them. I was not satisfied with the cubbing method.

148. *To Mr. Sampson.*—I should say that the item of £137,000 includes the cost of the power house. It ought to be. When the buildings coloured brown and blue on the block plan are completed, they will represent about a quarter of what are required. I understand that it is the wish of the Committee to get a complete schedule of the whole of buildings proposed, and also an estimate of their cost, together with all accessories. I will endeavour to obtain that information.

(Taken at Melbourne.)

WEDNESDAY, 21st APRIL, 1912.

Present:

Mr. RILEY, Chairman;

Senator Keating,	Mr. Finlayson,
Senator Lynch,	Mr. Gregory,
Senator Story,	Mr. Sampson,
Mr. Fenton,	Mr. Laird Smith.

Henry Edgar Morton, city architect and building surveyor, Melbourne, sworn and examined.

149. *To the Chairman.*—In my capacity as city architect the plans for every building erected in the city of Melbourne have to pass through my hands. I have seen the plans of the buildings proposed to be erected at the Flinders Naval Base, and, generally speaking, I regard them as suitable for the housing of a large number of men and for carrying out the operations of the Defence Department, but I notice there is at least one 11-inch cavity wall about 70 feet long. This is of rather light build, and would not be permitted in the city of Melbourne. The portion of the wall to which I refer has two 4½-inches of brick, with a 2-inch cavity. This on a three-story building is too light, particularly as the joists rest only on 4½ inches of brick. The ground and first floors are, in my opinion, all right; but the top floor is not strong enough. It looks like cutting the job to the bone. The buildings are of as cheap a character as can be put up. There is practically no finish about them at all. I have no objection to iron roofs. There are

plenty in the city, and there is nothing wrong about them if the ventilation is good. The proposed buildings at Flinders can be very easily ventilated, because there are windows on both sides. I notice that verandahs have not been built completely round the building I have in mind, and I think that is a very good thing. No verandah ought to be placed on the east side, and many would not have them on the south side. On the south they are very nice in the summer, but in the winter verandahs have the effect of reducing the amount of sunlight which should be permitted to enter a building. If assessment doors were constructed that would not be much improvement, because the verandahs on these sides frequently give a cold, damp, miserable appearance to a building. I cannot express an opinion regarding the layout of the building generally. That, I take it, would be more for the Naval authorities to deal with than a matter of architectural requirement. My view of single-story buildings as compared with buildings of three stories is that single stories are very nice if you have plenty of space and plenty of money, but if you want to economise in either, you will have to go in for the two or three-story buildings. A single building will cost more *pro rata* than the other. In a three-story building one roof covers the three stories. In a single-story building three times the quantity of roof is required, together with greater foundations. My chief objection to the plan is to this 9-inch wall. I do not like it along such a distance, because there is a considerable wind pressure, and in case of fire such a wall is almost certain to collapse. It might be satisfactory under ordinary conditions, but in case of fire it would be almost certain to fall over. The difference between a cavity wall and a solid wall is chiefly one of strength. The solid wall is much the stronger of the two. The planks put on on top of the other are not as strong as one single plank double the thickness. The same argument applies to a wall which is, after all, merely a beam having to take the weight of the roof. I admit that the air cushion in a cavity wall acts as a non-conductor and keeps the building cool in summer. From that point of view the cavity wall is satisfactory, but in this case there is a considerable sacrifice of strength.

150. *To Senator Story.*—I see there are piers at intervals in this wall, and also that metal ties are to be fixed. These will strengthen it to a considerable extent, but I do not consider that a number of ties would make a 9-inch cavity wall equal to a 9-inch solid wall. The strength of a wall is in ratio to the square of its thickness. The square of nine is eighty-one. The square of four and a half is twenty. Multiply that by two and the result is forty, which suggests that the cavity wall is only half as strong as the solid wall would be. Buttresses will strengthen a wall locally, but not along its entire length. In this case the buttresses which are about 12 feet apart and 18 inches long would not make the wall anything like as strong as a solid wall. In the city 13½ inches would be the lowest thickness we would accept for a wall of that length, though if it were built in cement we could accept a 9-inch wall with buttresses, but that does not have the effect of strengthening the wall very much. Hollow walls are chiefly used in the construction of dwellings-houses. There are plenty of 9-inch hollow walls in existence, but they are strengthened by 4½-inch partition walls. There is no such strengthening

as that in this building over the whole length of 70 feet. I would not build such a wall. My principal objection is that it is not strong enough. It will not collapse with the dead weight on it, but, as I have said, in case of fire, the wall would not last very long, and when it fell it would bring the whole of the roof with it. I do not know what the wind pressure is likely to be, but I would anticipate that that wall would probably crack badly on account of the wind. I suppose a pressure of 30 lbs. per square foot may be looked for. That along a distance of 70 feet might be dangerous.

151. *To the Chairman.*—My objection would be influenced by the height of the building. I see that it is only 10 feet from the top of the tie beam to the floor line. That is not very high.

152. *To Senator Story.*—That fact influences my objection to a certain extent; but I would not build a wall like that 70 feet long all the same. If it were built in cement it would be better, but cement is not too good in case of fire. There would always be a risk even if the wall were a first-class lime wall. It might stand the wind, but I think it would crack.

153. *To the Chairman.*—The point I wish to emphasize, speaking as city architect, is that a wall of that character 70 feet long would not be sanctioned in the city of Melbourne.

154. *To Mr. Gregory.*—I think it probable that the wind would be considerably stronger than we get in Melbourne. I do not know this site, but I think you may expect wind pressure up to 30 lbs. per square foot, whereas it is very seldom we get anything up to 20 lbs. in Melbourne. When we get anything over 20 lbs., we find the chimneys fall over. About two years ago, when the chimneys of University Buildings were blown down, the wind pressure was not as high as 20 lbs. When all the roofs along the Horse Market yards in Elizabeth street were stripped from one end to the other, and chimneys were blown over some time ago, if I remember rightly, the wind pressure was not more than about 15 lbs. My suggestion is that another 4½ inches be added to the thickness of that top story of brick. The wall and flooring immediately below that is 15½ inches, with 1½-inch cavity. I would carry that to the roof.

155. *To Senator Story.*—It is not necessarily on account of the danger of fire in the city that we insist upon the walls being of the thickness I have stated. In the city there is not the same danger from the wind pressure that there would be in an open place, but even in the absence of this wind pressure we should insist upon thick walls. The risk of fire is unquestionably partly the reason for the building regulations in the city being what they are. They are the outcome of centuries of experience gained in the different cities of the world, but it is not from any fear of the walls collapsing that the regulations are what they are, although the question of wind pressure has probably been considered. It is possible to stiffen a wall afterwards, but it would cost a considerable sum of money, and in this instance, I think, you are cutting it too fine. With a wall less than 70 feet in length, my objection would not apply to the same extent, and my observations refer to the petty officers' and instructors' rooms solid, but that does not have the effect of strengthening the wall very much. Hollow walls are chiefly used in the construction of dwellings-houses. There are plenty of 9-inch hollow walls in existence, but they are strengthened by 4½-inch partition walls. There is no such strengthening

156. *To Mr. Laird Smith.*—If I were building the barracks I think I would risk the wall as it

stands now. The 9-inch wall over a shorter distance in the barracks would be, I think, quite safe. I would not, however, feel justified in taking it a length of 70 feet. With regard to the general appearance of the buildings, I have no observation to make. Generally speaking, the buildings appear to be quite satisfactory for the purposes for which they are intended. The advantage of a two or three-story building is that the cost of labour is reduced to the absolute lowest minimum. In a single-story building time is wasted travelling backwards and forwards. I think these buildings are admirably situated for the purposes for which they are required. In case of fire the verandahs round them will act as escapes. The cost of increasing the thickness of the wall I have spoken of would not be a great deal.

157. To Mr. Sampson.—I do not know that my objection to the thickness of the walls is prompted by consideration other than those of the wind pressure and the danger of fire. It does not apply to the foundations of walls is concerned. The general durability of the building, or so far as the foundations will be governed by the thickness of the lower story. Thickness has nothing to do with the life of a wall. That depends upon the quality of the material.

158. To Senator Lynch.—I have no special preference for any particular quality of brick. There is a difference between hand-made bricks and machine-made bricks, and I should not think the former should be considered, or that it is likely that an attempt will be made to make them. The hand-made brick is far more porous than the machine-made brick, and has not got the same strength. I am satisfied that the average brick made in Melbourne would resist the weather at Westernport, though with regard to mortar there is a great difference in the various qualities of lime. I would suggest the use of a good hydraulic lime. Coimada lime is very strong material for use in a brick wall, but not for plaster. The cement added would depend upon the quality of the lime. If Coimada lime were used cement would not be required at all. Galvanized iron was the cheapest roofing, and it ought to be satisfactory. Cheap galvanizing would leave the iron subject to corrosion, but galvanized-iron roofs are lasting at St. Kilda all right, and I think you have galvanized iron at Queenscliff, which is proving serviceable on most of the buildings there. I do not know that I prefer any particular kind of paint. Galvanizing is as good a preservative as you can get. In the low-lying portions of Melbourne there are many iron roofs which are badly corroded, but we have got a lot of old roofs made from Scotch iron still in existence, and it is nearly forty years since the last Scotch iron came here. I do not know that I can suggest anything better than galvanized iron of the best quality, though it is all pretty well of a standard. In Melbourne it is all one price, except one particular brand, which is 7s. 6d. a ton dearer than the others. Galvanized iron is the cheapest form of roof, and it is the roof that can most easily be repaired. As a matter of fact, in a great many of our own buildings, where the roofs were giving trouble, we have taken the slates off and put galvanized iron on in its place. In the metropolitan area there is no direct attempt made to forbid the erection of wooden buildings with galvanized-iron roofings, though the regulations stipulate that a building of that description must be a distance equal to its own height from the next building. That regulation is equivalent to prohibition in certain cases. The position, of course, is different

in a suburban area, where land is cheap. The wooden erection becomes less desirable as land gets dearer. I do not know that the humidity of the ground is altogether a bar to the use of bricks. At the abattoir brick buildings have been erected on ground practically flooded with water. The City Council have erected the buildings on a foundation of reinforced concrete piles. That, I think, is the safest method to pursue in land of that description. The City Council always did put up buildings of brick, and, generally speaking, I would use bricks unless there were some special reason for the contrary. If the objection to the use of brick in this case is that the depth of soil is only 5 or 6 feet, I do not think it very serious. The depth might be much greater, and it still would be possible to build on piles. I cannot give a definite idea of the cost of building on this principle—everything would depend upon the carrying capacity of the ground. Some ground will carry 2 tons, other ground will carry 4 tons; rock can carry 30 tons to the square foot. The width of the foundations will also depend upon the nature of the ground. In the ordinary type of building, with the ordinary thickness of walls, it is not often that more than 2½ tons to the square foot is obtained. Any decent ground will carry that. So that in ordinary construction the foundation is not a matter to worry about. In steel buildings, or buildings of reinforced concrete, where the whole of the weight rests upon individual columns, it becomes a more serious matter.

159. To Mr. Finlayson.—From my general view of the plans I am satisfied that the buildings provide sufficient light. The minimum usually allowed for any room is one-tenth of the floor area. So far as I can see, you are well above that. As to ventilation, all the windows are of double sash, and it is only a question of opening them to get as much cross ventilation as you like. Everything is there for ventilation if it is used. My only objection to the use of verandahs all round the building is that it will reduce the amount of light, and in winter time I regard the sunlight as of more value than the space. In any case I would not have verandahs either on the south or the east of a building. On the north and west they may be all right. With the afternoon sun on the south side, it may be an advantage to have a verandah, but I am speaking generally of buildings due north and south. It is really a question as to whether the increased accommodation provided by the verandahs is more than counterbalanced by the advantage of getting sunlight directly into the building, though I do not look upon verandahs as intended to increase accommodation. In regard to heating, I take it that the most economical system will be adopted—the hot-water radiator. There is no provision for fireplaces in the plans, though I think a heating apparatus should be provided. The men at a naval station will be found to understand the hot-water system, and a high or low pressure apparatus can be used. There is no doubt in my mind that climatic conditions are such that the winter will require some sort of heating apparatus. The ordinary stoves, ranges, the drill hall, and certain other rooms will be suitable for the class of building required if erected of wood and galvanized iron. As to the administration offices, however, I should prefer them to be of brick. Although the offices are not to be in any sense residential, I take it that they will be occupied from 8 o'clock in the morning to 5 o'clock in the afternoon. Wood and plaster buildings might be suitable; if the foundations

are going to run you into a lot of money it may be cheaper to build of wood and paint it every three years. I have had some experience of fibro cement. I do not like it because it gets knocked, and when a piece is broken the whole sheet has to be taken out, and it is a rather expensive proceeding.

160. To Mr. Fenton.—The reason why I say hollow walls are more liable to crack than solid walls owing to wind pressure is that they are not so strong. I was not thinking of foundations. My view regarding reinforced concrete is that it is very good for a certain class of building. It is splendid for stores or warehouses, where the building is practically a shell, with so many floors, but in a building that is broken up pretty considerably the cost of using reinforced concrete mounts up. Large buildings of reinforced concrete are at the present moment being erected in Melbourne, but several considerations have to be regarded where land costs £1,000 per foot. In a building of eight or ten stories, the thickness of the foundation wall may be a very serious matter. The top story may be 13½ inches thick, the next two 15 inches, the next two 23½ inches, the next two 27 inches, the next two 31½ inches, and the next two 36 inches, and on the ground floor it may be necessary, in a building of ordinary construction, to have a wall as much as 3 feet thick, in which case the value of the land upon which these walls are built would be a matter of £6,000. If reinforced concrete were used the thickness of the foundation wall would mean a saving of 5 feet, which might represent £5,000. Where land is cheap that consideration might not apply, but in the city it is important. I do not say that reinforced concrete is preferable to brick in the matter of durability, but for the particular class of building now being considered brick would be cheaper. I would regard cavity walls as preferable to solid walls where the health of the occupants is concerned; but, generally speaking, and from the point of view of material, method of construction, number of stories, and so on, with the exception of the instance to which I have taken exception, those buildings appear to be serviceable for the purposes for which they are intended. They seem to have been admirably thought out in regard to their accommodation, and the cubic space seems to be very ample. There is as much accommodation there as there would be at a hospital. In my opinion, 600 cubic feet per head is ample allowance. The allowance for a common lodging house is 500 cubic feet. You have got 20 per cent. above that.

161. To Senator Storey.—If I were employed by the Naval Department to construct barracks, and my instructions were that the conditions at the barracks should, as far as possible, approach conditions at sea, I think I should provide heating apparatus. Personally, I think the men should get what comforts are possible while ashore, considering what they have to suffer when they are at sea. You might make things as comfortable as you can, and not as uncomfortable. If the condition that the barracks should represent as nearly as possible what a man would have to endure at sea were insisted upon, I do not think you would allow each man 600 cubic feet of space, and I do not think they would be allowed the lighting they will get here. If they were on board ship they would have to be satisfied with artificial ventilation, and practically no lighting at all. I do not see why you should not make this allowance for heating. They give facilities for heating the barracks for soldiers. Why not for sailors?

162. To Mr. Fenton.—Notwithstanding that there is to be an electric power station on the site, I do not think it would be nearly so cheap to use electricity for heating purposes as hot water pipes. Hot water will cost about one-tenth the amount electricity will cost. We supply electricity for radiators, we use it in our own buildings, but it is very expensive.

163. To the Chairman.—Another point about the plans which I do not like refers to the class of urinals provided. We have given up altogether the use of the cheaper class, and have gone in for fireclay. They cost a bit more, but they are far better in every way, far sweeter and far cleaner.

164. To Mr. Gregory.—Salt water will injure iron pipes if it is used for the purpose of flushing. That is our experience with the water used for our condensing plant. One pipe was corroded 4 inches in three years. If it is necessary to use salt water for flushing purposes you will, I presume, use cast-iron pipes with a short a connexion as possible. You might use wood pipes, or you might get over the difficulty by using copper.

165. To Senator Storey.—I think it is far better to have the lavatories and urinals detached from the building with a free current of air passing through. I notice also that you encase the girders in concrete. Do not have any bare steel joints anywhere. In case of fire they twist and turn in all directions, and it is far better to use timber. Put a wire mesh round the girders in which the concrete can be held, but do not have any bare steel girders. I presume you are going to have a fire service with chemical extinguishers. They do not run into very much, and they are very handy in a place like this.

(Taken at Melbourne.)

THURSDAY, 22ND APRIL, 1915.

Present:

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| Mr. RILEY, Chairman; | |
| Senator Keating, | Mr. Gregory, |
| Senator Storey, | Mr. Sampson, |
| Mr. Fenton, | Mr. Laird Smith, |
| Mr. Finlayson, | |

George Wm. Watson, Chief Government Architect, Victoria, sworn and examined.

166. To the Chairman.—When I am asked to say whether the plans of the proposed buildings at Flinders Naval Base make provision for buildings suitable for the purpose for which they are intended I should like first of all to say that it would not be fair to myself, and certainly not to the designer of the plans, that I should express a definite opinion unless I had the drawings before me, the instructions to the architect, and an opportunity for some examination of the plans. But from a cursory glance at the observations of the buildings I am able to say that they should be cheaply constructed. There are no architectural embellishments of any kind about them. I should know really what the designer had to provide for to enable me to say whether these plans make provision for the accommodation required. There is nothing at all extravagant about these designs, but an examination of the plans would be required to enable me to say whether they would meet the requirements in the most economical

way. I see that provision is made for three-story buildings with a cavity wall and piers, and while I say that they would be as good enough, I must add that it would not be allowed in Melbourne. It would not be in accordance with the city building regulations or in accordance with the practice of my Department. I should prefer a 14-in. wall.

167. To Mr. Laird Smith.—A building of the kind provided for by these plans would not be liable to collapse. It is too narrow.

168. To the Chairman.—I see that there is provision in the plan of one of the dormitories for a wall 70 feet long, but with the cross ties I should have no hesitation in building such a wall. In our Department we would not finish the top stories of a three-story building with 0-in. brick-work and piers at intervals in the way proposed by these plans. As the Government have plenty of money I should prefer to provide for a solid wall. There is very little to be gained by the hollow walls and piers, as you have more coigns to contend with involving an increased cost of labour, if not of material, and as compared with a 14-in. wall the saving would be inconsiderable. I think that the 800 cubic feet of air space provided for is sufficient. It would not comply with the regulations of the Board of Health, but I think that in the circumstances it would be accepted. I consider the verandah provided an advantage. It would give additional accommodation. In my opinion the building would be wholesome enough if whitewashed inside. The lavatory accommodation provided for the officers' block is, in my opinion, sufficient. If petty officers are to sleep in the seamen's barracks as provided for in the plans, they should have separate lavatory accommodation. I consider the roofing of iron quite good enough, and the buildings so far as I can see, will be of a substantial character and could not be simpler in design. They should be quite good enough for the purpose. The proposal to have three-story buildings is economical, as the one roof will cover three floors. To have one-story buildings would necessitate for equal accommodation three times the amount of roofing. Generally, as to the advisability of having three-story buildings as compared with one-story buildings for these purposes I should not care if it were proposed to have five stories. The men will be divided into units, and may be more easily controlled in buildings of more than one story. If you had one-story buildings with windows and other openings on the one floor it is clear that a greater number of orderlies would be required for the proper supervision of the men. It is more economical to build in height than in area, and in my view the three-story buildings would not affect discipline and would assist in the supervision of the men.

169. To Mr. Laird Smith.—When I am informed that Mr. Murdoch has said that the barrack buildings will cost £30,213, or £14 per head for the men who will occupy the building, my comment is that the cost is exceedingly low, and I doubt whether it can be done for the price.

170. To Mr. Finlayson.—On a casual view of the plans the lighting provided for is ample. I could not say whether ventilation is amply provided for without knowing whether it is to be artificial or natural. Of course, you can make anything of the windows by having them opened or shut. The ventilation provision shown on the roof is only for exhausts. The trussion windows shown could be left open day and night. On the whole, I should say that the ventilation provided for appears to be sufficient. On the east and

south elevation I find that no verandahs are provided for. According to the orientation of the building I do not consider that that is a disadvantage. On the lowest story of the seamen's barracks a verandah is provided right round the building, and no doubt it would be convenient in cases of emergency to have the extra accommodation which would be provided if verandahs were similarly constructed for the other stories. If that were done it would involve bringing the casements of the windows of the other stories to the floor level. It is generally recognised in the building of barracks and similar buildings that the cantilever principle for verandahs to ground floor should be adopted, and that there should be as few posts as possible. Where this course is followed men may jump down from a floor, but they have no means of getting back. There would be no disadvantage in the way of the exclusion of light to have the verandahs continued all round and extra accommodation would be provided at a comparatively small extra cost. As to the advantage of having a solid wall for the top story, what is proposed in these plans is an 11-in. wall, 44-in. brick outside, 2-in. cavity, and 44-in. liner. No doubt that would be very cool, because a hollow wall is much cooler than a solid wall, but I do not think there is very much saved by it. It may be a matter of sentiment to prefer a solid wall. I think the solid wall is preferable, especially for a barracks where wear and tear may be anticipated. Where there is a 44-in. brick lining with a cavity behind it, my experience is that a number of bricks get displaced. Though there are usually regulations against it, the men will drive nails into the wall, which may have the effect of displacing some of the bricks. In connection with the building of an asylum, we adopted the hollow wall rather extensively, but abandoned it later. We found it more economical in the matter of cost to build it more economical at once and set all doubts at rest. It is recognised that the ties should be of three-sixteenths wire, specially galvanised. They have to be spaced 2 ft. 3 in. from centres. They have, of course, run into money and require to be very carefully put in and kept close to mortar. If the mortar gets in spots of damp will show on the wall. I have had forty years' experience of building in Victoria and know the conditions of the climate well. I have some knowledge of the conditions at the Plianders Naval Base, and in my opinion provision must be made for heating appliances in buildings there during the winter. The system I would suggest would be the system of hot-water radiators. They can be installed at any time, but there should be some scheme considered beforehand for their installation, otherwise the buildings would be knocked about a good deal in installing them. The most economical scheme would be to put in radial boilers, but these must be below the level of the first take-off, and that means some excavation. We have found that it is better than taking pipes across yards and barrack squares to have each heating system distinct. This prevents condensation. You may have a barracks not in use for a time, and if you have the one system for all your buildings this will lead to waste. The system necessary for a barracks accommodating 300 men would represent a fair installation by itself. It is recognised that it is made for a number of buildings, often those to which reference has been made so far, including kitchen and dining rooms behind the seamen's barracks, and it is proposed that these should be constructed of wood and iron. I would not construct a dining room of iron. It is recognised

money is available I always insist upon having dining rooms and recreation rooms for a number of men constructed in brick or concrete or of some material that will not retain heat in the same way as a wood and iron building will do. There would be no disadvantage in having a kitchen of wood and iron—the ordinary frame building. It is quite satisfactory to propose the construction of store buildings, drill halls, training rooms, and receiving sheds of wood and iron. When I am with the store buildings and where the clerical work is to be attended to it is to be erected upon made ground filled in from a depth of from 10 to 14 feet, I consider it satisfactory to propose that it should be constructed of wood. In the circumstances a wooden building would be preferable to a brick building, and preferable also to a wood and iron building. I should like to say that there is an American idea. The flat sheets of iron are imported and are rolled here in imitation of weatherboards. It is much cheaper than the ordinary corrugated iron because a sheet duced only by one-fifth by corrugating and is reduced in the way I have mentioned. We are using this weathered iron extensively now in several buildings. We have found it satisfactory. It is lasting and cheap. It can be nailed on in sheets to the studs. I should consider fibrous cement sheets too expensive for these buildings, though for ceiling purposes they are very good and are practically cut by 2 ft. 3 in. for about the same price as we can get a sheet of the material 6 ft. by 4 ft. I should have no objection, except on the ground of expense, to the use of fibrous cement for the buildings. It is very suitable if I doubt whether there is very much of it in the market now. There is an English brand being put upon what we are now getting, but I believe they are only using up old stock. It is very good if exposed and ripened for some time before being fixed, otherwise it is liable to shrink. I have heard it go off like a gun at times. We make provision in using it that it shall be seasoned and loose hung when fixed to permit of expansion. It becomes more brittle as it hardens. So far as I can judge from a cursory glance at the plans the buildings proposed should meet the requirements of naval men. In a climate like ours I would not favour the suggestion that the accommodation provided should more closely approximate the accommodation provided for seamen on board ship, of course, hammocks are rolled up during the day and the sleeping place is also used for dining and recreation rooms. I favour the accommodation provided by these plans. It is far more economical to have one dining room than to have a dining room on each floor. You have a central kitchen, and it is easy to imagine the number of lerts and attendants that would be required to serve meals on each floor. I have said that I consider 600 cubic feet of air space ample for the floor than if they slept in beds. The vitiated air is, of course, on top, and that has to be considered. In this respect there can be no comparison between the conditions in these buildings and on board ship, where you get a good blow through. Speaking generally, I should say that the buildings provided for would be suitable, comfortable,

and certainly economical. As to whether they would be entirely convenient depends upon the requirements to be met.

171. To Senator Storey.—In view of the proposed construction of the top story of these buildings with hollow walls of two 44-in. bricks and brick piers at intervals to carry the roof-ties, I have no doubt at all as to the stability of a wall 70 feet by 10 feet with piers at intervals of 10 feet. Still, if I were proposing the construction of these buildings I should provide for 14-in. solid walls, as the extra cost would be very little. When it is suggested to me that a cavity wall is cooler in hot weather and drier in wet weather than a solid wall I have only to say that under the city building regulations it is necessary to make a special application to secure permission to erect a hollow wall at all, because it is considered that a hollow is not as good as a solid wall. It is only in the construction of a certain class of building that an 11-in. wall would be permitted. The walls of these buildings are not going to be plastered; they are merely to be whitewashed, and as the men will be sure to drive nails into them they will not be so stable as a 14-in. solid wall. I have no doubt as to the stability of the walls proposed in these plans. There is no fear that the wind pressure will be caused them to crack. With the ties which will be used connecting the walls they will, in my opinion, be quite stable. I suppose that the price of cement at the present time is prohibitive of the use of concrete. I understand that the price of cement is now 25s. 4d. per 22s. is charged for colonial cement. The Commission is charged for colonial cement. The quantity on favorable terms, and we should be glad to take over some of it at an advance to-day.

172. To Mr. Sampson.—When I am told that Sir William Creswell has expressed himself as being unable to see the utility of piling room upon room when a bungalow building would be better suited for the purpose of a barracks and on the sound of the bugle men could be turned out of such a building more rapidly than from a building of two or three stories, I have only to say that I should advise the Admiral to visit the fire brigade station. If there are any men who require to get away quickly from their quarters they are certainly the firemen. They are housed at the top of their buildings, and I have never heard that any objection has been raised to their being housed in a building of more than one story. Roughly, the difference between the cost of a wooden and brick structure is as 60 to 100. I should prefer that a dining room should be constructed of brick. This would mean additional expense, of course, but I believe that if you make men comfortable at their meals you will have fewer complaints.

173. To Mr. Gregory.—I have had to carry out many works for the State Government equal to those indicated on these plans. I have just completed an asylum which cost £150,000 and accommodates 1,200 persons. When I am asked what I think of day labour in the construction of these works I have to say that we will not touch it if we can help it. Although we sometimes employ day labour it does not pay, and indeed I do not think it pays any one. Under the day-labour system the designer of a building has to be not only the architect but the contractor as well. He has to look after the purchase of material, the rejection and exchange of that material, and other matters of that kind. It is useless also to disguise the fact that men will not work for us as they will for a contractor, because a contractor has the power to

discharge men summarily whilst we have to show cause why a man should be discharged. Men may loaf with us, but if a man loafs with a contractor that is the end of him. The estimated cost of these buildings is very reasonable in view of the accommodation to be provided. When referring to the question of day labour I should add that what I have said that it must not be forgotten that all work done by day labour is good work, because of the constant supervision not only by the man who designed the building but of the different inspectors employed under him. In connection with the sanitary arrangements for buildings of this character, I should not think, so far as the water supply is concerned, of using salt water if fresh water is obtainable.

(Taken at Melbourne.)

WEDNESDAY, 23RD APRIL, 1915.

Members present:

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| Mr. RILEY, Chairman; | Mr. Gregory, |
| Senator Keating, | Mr. Sampson, |
| Senator Storey, | Mr. Laird Smith. |
| Mr. Penton, | |

John Smith Murdoch, Architect, Department of Home Affairs, recalled, and further examined.

174. To the Chairman.—I have previously described the buildings that we propose to erect at the Flinders Naval Base at an estimated cost of £100,872, and mentioned also that we had knowledge of other buildings that the Naval Department wished us to undertake, but into the details of which we had not been able to go. That includes the power-house, gymnasium, school, signal tower, and the hospital stokers' school. The plans for these are not before the Committee. I can supply the Committee with a list of the buildings that will be completed by the expenditure of the amount I have mentioned, together with the estimated cost of each. I shall prepare a table giving that information, which the Committee can include in their report. It will cover the buildings already submitted to the Committee and passed by Parliament. The remaining buildings can be put before the Committee later on. I quite admit that the three-story building with a hollow wall 14 inches thick to the second story and 9 inches thick to the top story would not be allowed to be erected in the city of Melbourne, as it does not conform to the municipal building regulations. I was not aware that one of the city architects stated in evidence that he doubted whether a 70-foot wall of these dimensions with out any partitions in it would stand the wind out any parts there. I know it is not in accordance with the building regulations, but these regulations do not really apply to us, and whilst we are always very glad to observe them as far as possible, we do not hesitate to depart from them when we think it can safely be done. Building regulations must be regarded as having been drawn up to meet the very worst class of building. The municipal surveyor cannot see all the buildings built, so the municipal clauses, in order to be reasonably sure that the buildings will be safe, prescribe that the walls must be of a certain thickness, but where a Government use the

very best of materials as we do, and have fairly complete supervision, as we have, I think it is allowable to depart from the regulations. I do not think there is any risk to the men who will sleep in this building. We do not depart from the regulations in this case in any flimsy or spirit, nor do we say that the regulations are wrong. We simply recognise that they had to be drawn up to meet the worst possible class of buildings, and we cannot think that our buildings are of that class. If I have any reputation as an architect I am quite prepared to risk it on the stability of the top story of this building with 9-inch cavity walls.

175. To Senator Storey.—If the wall were built of inferior bricks and poor mortar, in a slovenly fashion, there might be an element of danger, but built of the best materials, as we will build it, it will be safe. It is stiffened at every floor with steel cross joists at 11-feet intervals, and one wall supports the other. Where the steel joists go into the wall there are brick piers 4½ inches wide acting as buttresses. The steel joists will rest on the full width of the wall. The wind pressure at Westernport is not more severe than usual.

176. To the Chairman.—A verandah all round with casement windows right down to the ground would be an advantage. It is simply a question of money. I wanted a verandah put in, but Colonel Owen said we had to save the money, and I am inclined to agree with him. The verandah can always be added. The warming up of the dormitories, reading, and recreation rooms during the winter time would be done by hot water. The only provision made for that in the plans is the boiler rooms, which the cooks' staffs can attend to. There would be too much loss of heat with one big boiler for the whole installation. The cooking will largely be done by steam.

177. To Mr. Fenton.—The estimates of cost supplied to you do not cover the cost of the hot water installation. The pipes will be installed simultaneously with the building, but the scheme of hot water heating will be put forward as a separate work.

178. To Mr. Gregory.—It has not been hidden away; it has simply not been put before the Committee yet. The question has not been gone into, and we have not estimated the cost of it. We have made provision for the boilers, but the boiler and all the piping of each installation will be separate. It was determined, when the buildings were designed, to put heating installations in.

179. To Senator Storey.—I would not like to make a guess at the approximate cost of the piping for the barracks. We have Mr. Dixon, an engineer, who designs these schemes, and he has been so busy with the big machinery plant that is going into the Gesting Woollen Mills and other works that he has not been able to touch this matter yet. When supplying the Committee with our estimate for the building we shall put forward the heating scheme as a separate item. I should say, roughly, that it would cost something like £1,500, but I would not like the Committee to place much reliance on that figure.

180. To Mr. Fenton.—As the floors will be of wood it is not necessary to leave holes for the pipes to be brought through. Our method is not to conceal pipes. In our building up the street we have a maze of pipes all on the surface so that if anything goes wrong they can be got at at once. The estimate does not cover the cost of lighting. The electric lighting installation will be a different matter.

181. To the Chairman.—It will not be included in the estimate for a lighting scheme, but the matter has not been gone into yet. The Department is pushing on with the buildings so as to have everything ready.

182. To Mr. Sampson.—A brick dining-room would look better and be cooler. We provided an iron dining-room because we were attempting to provide dining accommodation without materially increasing the cost. It is purely a question of money. I prefer the more economical idea, because I do not think the object down there is to erect beautiful buildings. My idea is to make them useful and economical, more especially in this case, because this is the first of a great number of naval bases, and it would be a good thing to start with economical ideas as these plans will probably become standard plans for the others. A brick building, while it would look nicer and be a little more comfortable, would cost 25 or 30 per cent. more.

183. To Mr. Fenton.—The buildings that the men have to live in are of brick. They will be in the dining-room only three times a day for about half-an-hour each time. When you think of the number of people in this country who live all their lives in iron buildings it is not a very great hardship on young sailor men to have their meals in one.

184. To Mr. Sampson.—The walls are all of iron.

185. To the Chairman.—We were not thinking of lining them.

186. To Senator Storey.—They could be lined with wood or plaster later on if necessary.

187. To Mr. Fenton.—I could give the Committee estimates of the cost of the buildings, heating installation, lighting installation, and water supply installation separately, but I have not the information necessary so far as the sewerage installation is concerned. Provision has been made for all plumbers' fittings and pipes for laying on the water.

188. To the Chairman.—The Department are going to provide their own lighting and hot-water systems. I do not think the lighting will be a very big item, apart, of course, from the erection of the power-house and the installation of the generating plant.

189. To Mr. Gregory.—If we were calling for tenders we would call tenders for the hot-water installation separately. If a contract for these buildings were let the hot water and electric lighting might have been included, but I do not think so.

190. To Senator Storey.—In the case of private buildings separate quotations are frequently called for lighting and heating.

190A. To Mr. Fenton.—It would not be very exact to give the Committee the particulars for the lighting and heating installations, &c., covering the whole of the buildings proposed to be erected.

191. To Senator Storey.—That would embrace also portion of the cost of the contemplated additions.

192. To Mr. Sampson.—We could include in the estimated cost all the piping and wiring in a building, and exclude the pipes and wires leading up to the building. If the sum of £124,000 is provided on the Estimates, our estimated cost of the buildings I have described will not absorb it all, as they total only £100,872. I gave the Committee a list of other buildings which are to be erected, but which are not included in our figures. The £124,000 is simply a nebulous sum

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arrived at without any definite foundation to cover the probable expenditure. The basis of my estimate is the matured plans which are now before the Committee. It includes all these portions coloured brown and blue, and also the residences, but not the hospital.

193. To Mr. Laird Smith.—I told the Committee when I last gave evidence that we would house and provide cooking and dining accommodation for the men at the rate of £44 each. That is a low cost, but I do not think it is exceptionally low. It is practically lodging—it is the accommodation the men live in, due in, and sleep in.

194. To Senator Keating.—The cost will vary per head according to the number we provide for. The men all sleep in hammocks. In the case of the petty officers who are provided with beds the cost jumps up at once to about £120 or £130 per head. The cost for warrant officers and single officers is higher still; I think it is over £300 per head. I do not think that any of those prices are excessive.

195. To Mr. Gregory.—I am quite ignorant about the approximate cost of the power-house, but I could make a rough shot at the cost of the hospital. I can give the Committee an estimate of the cost of all the buildings shown on the plan, but I cannot say whether they cover all the requirements of the Defence Department. The possible extensions shown on the plan are given more as an indication of how we could extend the buildings than as a criterion of the naval requirements may be. I could supply you with the estimated cost of the extensions for any of those. All the buildings we have made plans for are those shown in colours. I am aware of much further expenditure in buildings having been asked for. I have mentioned already the hospital, the stokers' school, the gymnasium, which is to be removed from Williamsdown, the signal tower, and the power-house. The power-house is the one about which there is most doubt. I do not think the engineers have worked out the amount of power that is going to be required. It is quite possible that the Defence Department will want buildings costing £500,000 in all. There is no doubt it is going to be a big thing, but it is not possible for anybody at this moment to say what the requirements may develop into.

196. To Senator Storey.—I could give the Committee an estimate, not only of the cost of the buildings coloured on the plan, but also of those shown in outline, but there is no guarantee that the latter are what the Naval Department require. They are only an indication of how the buildings could be conveniently extended.

197. To Mr. Gregory.—I have principally conferred with Mr. Fauntleroy in regard to the drawing up of the plans. I have also conferred with Captain Gordon Smith, who came up to the office several times, and went into the question of the buildings with Colonel Owen. If the Committee wish it my estimate when complete will show the cost of sewerage within the buildings, and electric lighting, and hot-water installation, but I would estimate the hot water, lighting, water supply, and sewerage schemes. The inclusion of all those items may make the average cost per inmate more than £44, and if the Committee wishes it I will increase my estimates by including all the wiring and lighting within the buildings, all the hot-water piping within the buildings, and all the radiators within

the buildings. We have hot water installations in a good many offices, but not in any barracks. As to the question whether hot-water piping and radiators are healthy in sleeping rooms, every cold country in the world that I know of has them. I do not think it will be necessary to instal heating apparatus in any Slate other than Victoria, except perhaps in the case of the recreation rooms. If only one or two rooms have to be heated we could put in fireplaces. I like to see radiators in reading rooms. I do not think they are to be found in the dormitories in our big public schools, but this room at the Naval Base is more than a dormitory. It is also their day room, and the men spend a great deal of their time in it. I am afraid if we omitted the heating apparatus there would be a complaint at once. I cannot mention any similar room in Victoria with a hot-water installation. I think the Defence Department's plans provided fireplaces for the single-story bungalow dormitories. The heating apparatus could be turned off at night, if necessary.

To Mr. Fenton.—With regard to your statement, that the original estimates of the naval authorities largely exceeded what we propose to construct these works for, I do not think they supplied us with estimates at all; they simply supplied us with sketches of what they thought should be done. It was the same in the case of the Jarvis Bay works. We use our own discretion as to whether we should adopt their suggestions or amend them on economic grounds. As a rule, the Minister or Assistant Minister of Defence obtains from us, and not from the naval authorities, the estimated cost of a building. In the very early stages he may get it from the Defence Department, but in the later stages he will probably get it from us.

(Taken at Melbourne.)

TUESDAY, 4TH MAY, 1915.

Present:

Mr. RILEY, Chairman;

Senator Keating, } Mr. Gregory,
Senator Storey, } Mr. Sampson,
Mr. Fenton, } Mr. Laird Smith.

199. John Smith Murdoch, architect, Department of Home Affairs, recalled, handed in the following statement:—

Melbourne, 3rd May, 1915.

Memorandum to

The Director-General of Works,
Department of Home Affairs.

In giving evidence on the 28th ultimo before the Parliamentary Standing Committee on Public Works, the Chairman requested me to provide him with a list and estimate of cost of those buildings proposed to be erected at the Pflinders Naval Base, the drawings of which have been prepared and been under consideration by the Committee. I accordingly submit such list:—

	£	s	d
Chief Petty Officers and Instructors— Brick buildings (first section, 78 men)	5,867	215	
Electric light installation	780		
Heating installation			9,802
Kitchen (to serve above)— Timber and iron	584		
Electric light installation	30		614

	£	s	d
Bakery (with oven) to serve the whole institution— Timber and iron	1,900		
Electric light installation	25		1,225
Seamen's Barracks— Two brick buildings (each for 342 men)	27,051		
Electric light installation	720		
Heating installation	1,700		30,104
Dining Rooms— Timber and iron (for 684 men for the above two blocks)	1,754		
Electric light installation	130		
Heating installation	460		2,344
Kitchen— Timber and iron (to serve the above two barrack blocks and a future block)	805		
Electric light installation	35		840
Warrant Officers' Quarters (first sec- tion, 19 officers)— Brick buildings, with kitchen, stewards' and cooks' rooms	5,534		
Electric light installation	140		5,674
Single Officers' Quarters (first section, 10 officers)— Brick buildings, with kitchen, stewards' and cooks' rooms	5,534		
Electric light installation	140		5,674
Drill Hall, Armoury, and Offices— Timber and corrugated iron	3,150		
Electric light installation	100		3,250
Ammunition, Lecture-room, and Offices— Timber and corrugated iron	1,300		
Electric light installation	60		1,360
Armourers' Workshop— Timber and corrugated iron	350		
Electric light installation	25		375
Drill and Stripping Battery (first sec- tion)— Timber and corrugated iron	1,700		
Electric light installation	60		1,750
Shooting Battery (first section)— Timber and corrugated iron	1,500		
Electric light installation	40		1,540
Victualling Store (for beef, vegetables, &c., first section)— Timber and corrugated iron	1,900		
Electric light installation	55		
Cold storage installation	1,100		3,145
Store for Clothing, Implements, &c.— Timber and corrugated iron	2,700		
Electric light installation	80		2,780
Store for Inflammables— Brick and concrete	850		
Electric light installation	25		876
Naval Store, Miscellaneous Articles— Timber and iron	2,700		
Electric light installation	80		2,780
Naval Store, Metal Articles, &c.— Timber and corrugated iron	2,000		
Electric light installation	80		2,080
Naval Store, Stationery and Con- demned Stores (first section)— Timber and corrugated iron	1,800		
Electric light installation	60		1,850
Surgey— Timber and weatherboards	350		
Electric light installation	15		365
Receiving Shed (first section)— Timber and corrugated iron	1,700		
Electric light installation	60		1,750

	£	s	d
Administrative Block— Timber and fibro-cement	3,000		
Electric light installation	100		3,100
Main Guard— Timber, corrugated iron, and brick Electric light installation	1,100		60
Boatswain's Store, &c.— Timber and corrugated iron	700		
Electric light installation	40		740
Torpedo and Mining School (first section)— Timber and corrugated iron	2,300		
Electric light installation	175		
Heating installation	400		3,675
Latrines— Timber and iron	300		
Electric light installation	10		310
Painter and Plumber Shop— Brick building	400		
Electric light installation	20		420
Boat Store, Boat Builders' Shop, &c.— Timber and corrugated iron	5,000		
Electric light installation	200		5,200
Magazine— Brick building	600		
Wireless Telegraphy Station— Brick building	700		
Electric light installation	35		735
Wireless Telegraphy and Signal School— Timber and corrugated iron	3,500		
Electric light installation	175		
Heating installation	400		4,075
*Captain in Charge— Brick residences	2,300		
Electric light installation	60		2,360
*Senior Officers— Brick residence (No. 1)	1,700		
Electric light installation	50		1,750
*Junior Officers— Brick residence (No. 1)	1,200		
Electric light installation	40		1,240
*Warrant Officers— Timber residence (No. 1)	650		
Electric light installation	30		680
*Timber residences (No. 2)	550		
Electric light installation	30		580
Total			£111,032

I have, at the request of the Committee, added to the above estimate the probable costs of installing electric lighting and hot water heating in those buildings considered to require same; I have also added the costs of cold storage plant in the Victualling Store. With regard to the buildings marked with an asterisk, the estimates of cost have been prepared from sketch drawings supplied by the Navy Office. The drawings indicate the accommodation suggested, but working drawings, which, in all probability, may embrace considerable modification of the Navy Office plans, have not yet been completed by the Department of Home Affairs, so that it is possible a final estimate of cost of these buildings may vary somewhat from the amounts stated above. The following additional buildings have so far been stated by the Navy Office as requisite, but drawings and estimates of cost have not yet been prepared:—
Gymnasium (to be transferred from Williamstown),
Stokers' School,
Power Station, Boiler-maker Workshops, &c.,
Navy Department Sick-bay,
Signal Tower,
Hospital Buildings.
J. S. Murdoch, Architect.
3rd May, 1915.