Laid on the Table by Senator Newland

Pursuant to Statute
~~By PARLIAMENTARY~~ STANDING COMMITTEE ON PUBLIC WORKS.
~~In returns to Order~~

Clerk of the Senate

1-7-20.

P A P E R S
to be laid on the Table of the SENATE.

R E P O R T

together with MINUTES OF EVIDENCE relating to the proposed

ERECTION of MOBILIZATION and VEHICLE STORES at SEYMOUR,
VICTORIA.

1920.

COMMONWEALTH OF AUSTRALIA.

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

REPORT

TOGETHER WITH

MINUTES OF EVIDENCE

RELATING TO THE PROPOSED

ERECTION OF MOBILIZATION AND VEHICLE STORES AT SEYMOUR, VICTORIA.

Printed and Published for the GOVERNMENT of the COMMONWEALTH of AUSTRALIA by ALBERT J. MULLETT, Government Printer for the State of Victoria.

F.7640.

MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

(Third Committee.)

THE HONORABLE HENRY GREGORY, M.P., Chairman.

Senate.	*House of Representatives.*
Senator George Henderson	Llewelyn Atkinson, Esquire, M.P.
Senator Edward Needham	The Honorable Frederick William Bamford, M.P.
Senator John Newland, Vice-Chairman.	George Hugh Mackay, Esquire, M.P.
	James Mathews, Esquire, M.P.
	Parker John Moloney, Esquire, M.P.

INDEX.

LIST OF WITNESSES.

EXTRACT FROM THE VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES,
No. 23 OF 28TH APRIL, 1920.

16. PUBLIC WORKS COMMITTEE—REFERENCE OF WORK—MOBILIZATION AND VEHICLE STORES AT SEYMOUR.—Mr. Groom moved, pursuant to notice, That, in accordance with the provisions of the *Commonwealth Public Works Committee Act* 1913–1914, the following work be referred to the Parliamentary Standing Committee on Public Works for their report thereon, viz.: Mobilization and Vehicle Stores at Seymour, Victoria, with the necessary railway connexion, water supply, &c.

Mr. Groom having laid on the Table plans, &c., in connexion with the proposed work—

Debate ensued.

Question—put and passed.

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

MOBILIZATION AND VEHICLE STORES, SEYMOUR, VICTORIA.

REPORT.

The Parliamentary Standing Committee on Public Works, to which the House of Representatives referred for investigation and report the question of the erection of Mobilization and Vehicle Stores at Seymour, Victoria, has the honour to report as follows:—

INTRODUCTORY.

1. In connexion with the despatch of the Australian Imperial Force for service abroad it was arranged that the Commonwealth should supply troops fully equipped. Much of the material was supplied from Australia, but it was not found possible to supply all the equipment, and in consequence the British Government provided certain equipment in the later stages of the war and debited the cost to the Commonwealth. It was further agreed that the Commonwealth should pay to the British Government a certain amount per man per day for maintenance of this equipment and that on the termination of hostilities the material should belong to Australia, the British Government replacing all deficiencies and making good all damages, so that the equipment of the whole of the Australian Divisions engaged in the recent war when handed over should be either new or in serviceable order.

This material is now being returned to Australia and it is intended that certain specific quantities should be held in each State as a reserve stock in the case of war.

PRESENT PROPOSALS.

BUILDINGS.

2. The proposal now under consideration is to erect on a site selected at a distance of about 70 chains from the Seymour railway station stores to house such of the material as has been allocated to the State of Victoria.

3. The storage space required by the Department of Defence to meet present needs is stated to be 150,000 square feet for vehicles and about 60,000 square feet for equipment. It is proposed to meet these needs by the erection of five vehicle stores, each 300 feet long by 100 feet wide, and two equipment stores, each 306 feet long by 100 feet wide.

4. The construction proposed to be adopted is hardwood framing for the walls, hardwood and oregon pine for the roof frame, and galvanized iron for the walls and roof. The supports proposed are of hardwood set in concrete.

5. The wall plate of the vehicle stores is intended to be 11 feet high, and the roof will be open to the top; the distance from the floor to the apex of the roof being 20 feet. In the case of the vehicle stores the flooring is proposed to be of bricks laid on the flat in sand and grouted with cement, whilst in the case of the equipment stores it is proposed to be of timber. The roof of the equipment stores will be lined to temper the heat and the floors will be 3 ft. 6 in. to 4 ft. from the ground.

6. It is proposed to construct the vehicle stores with two clear spans of 50 feet with a row of posts down the centre; the equipment stores, on the other hand, are proposed with bays of 25 feet across the building and 16 feet centres on the length of the buildings.

7. For the equipment stores it is proposed to provide sliding doors and a clerestory or lantern light extending the whole length of the building. It is not proposed to provide doors at all for the vehicle stores, but one side for its whole length will be left completely open. It is further proposed in the vehicle stores that the galvanized iron wall shall not reach to the ground level—a space being left for practically the whole length of the building for air circulation. A space is also proposed under the eaves of this building for the same purpose.

8. The vehicle stores are proposed to be erected facing the main road and at a distance of about 10 feet therefrom; the distance between the vehicle stores from the front of one to the back

of another being 120 feet and the distance from the northern end of the vehicle stores to the southern side of the platform of the equipment stores 99 feet.

9. In addition to the storage accommodation, it is proposed to erect a brick cottage for the accommodation of the resident caretaker.

Site.

10. The site on which it is proposed to erect these buildings comprises an area of approximately 47 acres, having a main road on the south boundary and running back to a creek on the north boundary. It is proposed to enclose this with a simple fence consisting of four barbed wires, ordinary posts, and droppers.

Railway Siding.

11. To connect the site of the buildings with the Victorian railway system it is proposed to construct from the Seymour railway station a siding having a route mileage of 72 chains 30 links, and a track mileage of 1 mile 41 chains 5 links. This line is proposed to be of 60 lb. serviceable second-hand rails with sleepers and crossing timbers of new material. The length from the railway to the loop sidings will be approximately 48 chains and there will be over 20 chains of three sets of rails serving the stores.

Water Supply.

12. To provide the water supply said to be necessary it is the intention to deliver water from the service reservoir of the Seymour town supply by a 6-inch pipe of about 8,000 feet in length; while in case of emergency further supplies can be pumped from the Goulburn River.

ESTIMATED COST.

13. The estimated cost of the proposal submitted is:—

	£
5 Vehicle Stores at £6,500	32,500
2 Latrine Annexes with "Kaustine" system of sewage disposal at £145	290
2 Equipment Stores at £10,700	21,400
1 Caretaker's Cottage, including "Kaustine" system of sewage disposal	765
Roads and Paths, including levelling of site	2,825
Fencing and Gates	600
Main Water Supply and Fire Hydrants	4,650
Railway Siding	8,560
Storm Water Drains	1,863
Horse Troughs, Sinks, Washing-down Draw-offs, &c.	219
Contingencies	5,000
Total	£78,672

COMMITTEE'S INVESTIGATIONS.

14. The Committee visited the Camps at Broadmeadows and Seymour, the site proposed for the Mobilization and Vehicle Stores at Seymour, and the Defence area at Liverpool where stores to serve a similar object for the State of New South Wales have been and are being erected.

15. Evidence was taken from officers of the Department of Defence as to the reasons which led to the selection of the site at Seymour; witnesses from Broadmeadows and Seymour were examined in order to permit of the residents of those localities placing before the Committee their views as to the suitability of such places for camping and store purposes, and a careful inspection was made of the buildings already erected at Liverpool and the goods stored therein.

16. It was ascertained that it was proposed to keep in the equipment stores rifles, personal equipment for soldiers, camp equipment, such as tents, cooking utensils, entrenching tools, harness, saddlery and pack saddlery, tools of practically all trades, blocks and tackles, signalling, survey, and drafting stores and instruments, field hospital stores, blankets, range-finding stores, machine guns and mountings, batteries, cables, and electric stores generally, field telegraph and telephone stores, including wireless, bridging material, miners' tools and water supply stores.

17. It is proposed to house in the vehicle stores field artillery guns, limbers, carriages, cookers, filters, &c., carts and waggons, and spare parts.

Site.

18. After careful consideration of all the evidence placed before it and giving due weight to the military reasons underlying the selection of mobilization store centres, the Committee is convinced that it would not have been advisable to erect the stores on the camp area at Broadmeadows and that the location of the stores at Seymour has many advantages, particularly by

reason of its proximity to the suggested training ground, a condition which the Committee considers essential for efficiency and economy. The Committee is therefore satisfied that the site selected at Seymour is suitable and recommends its adoption.

Buildings.

19. Careful scrutiny was made of the plans of the buildings proposed to be erected and evidence was taken as to the possibility or advisability of constructing same in brick or concrete. It was explained however that the scarcity of bricks and labour, the present high price of cement, and the greater time that would necessarily be occupied in constructing the buildings of either brick or concrete, coupled with the fact that the buildings as proposed are expected to have a life of at least 40 or 50 years, decided the Committee in favour of wood and iron as proposed. In the event, however, of difficulty being experienced in obtaining suitable timber for the framing and roof principals the Committee recommends that other suitable materials be utilized rather than that the work should be delayed, as evidence was given to the effect that a large proportion of the stores to be housed are already on their way to Australia.

20. Consideration was given to the question of using for the roof principals standard steel construction or a patent standardized system of building with triangular units known as the "Gawco" system. The Committee visited the "Gawco" foundry and examined the system carefully and inspected a factory roof constructed in accordance with this system. Though satisfied that this method of construction had much to commend it, the Committee was not convinced that the buildings could be erected with these units more advantageously than in accordance with the design proposed, and decided for the latter.

The decision arrived at by the Committee in connexion with this matter is shown in the following extract from its Minutes of Proceedings:—

Senator Needham moved—That the "Gawco" system of roof construction be recommended.
Seconded by Senator Newland.
Mr. Mathews moved as an amendment—That the roof principals be of hardwood and oregon in accordance with the Departmental suggestion.
Seconded by Mr. Atkinson.
The Committee divided on the amendment—

Ayes (4).	Noes (3).
Mr. Atkinson,	Mr. Bamford,
Mr. Gregory,	Senator Needham,
Mr. Mathews,	Senator Newland.
Mr. Moloney.	

And so it was resolved in the affirmative.

21. In the initial stages of the inquiry the Committee was inclined to the belief that the number and size of the buildings proposed were excessive, but after seeing the quantity and variety of goods stored at Liverpool and ascertaining that about £7,000,000 worth of goods are being sent to Australia, of which about £3,000,000 worth will be kept in Victoria, it is satisfied that the storage space asked for will all be required.

Vehicle Stores.

22. Personal inspection of the vehicles in the Liverpool buildings and evidence obtained as to the heights of the highest vehicles to be stored in the buildings being erected at Seymour failed to convince the Committee of the necessity for having the walls 11 feet high to the wall plate as proposed and it was considered that they might with advantage and economy be reduced to a height of 9 ft. 6 in.

The decision arrived at by the Committee in connexion with this matter is shown in the following extract from its Minutes of Proceedings:—

Mr. Mathews moved—That the height of the walls of the Vehicle Stores be reduced to 9 ft. 6 in.
Seconded by Senator Needham.
Mr. Bamford moved as an amendment—That the height of the walls of the Vehicle Stores be 10 feet.
Seconded by Mr. Atkinson.
The Committee divided on the amendment:—

Ayes (3).	Noes (4).
Mr. Atkinson,	Mr. Mathews,
Mr. Bamford,	Mr. Moloney,
Mr. Gregory.	Senator Needham.
	Senator Newland.

And so it passed in the negative.

The original motion was then put and carried unanimously.

23. The Committee was not favorably impressed by the proposal that the Vehicle Stores should be completely open on one side in view of the possible danger of damage to the vehicles by reason of exposure to sun, rain, and dust, the presence of birds, &c. The constructing officers of the Department of Works and Railways and the senior officers of the Department of Defence were all opposed to this proposal and the Committee is therefore of opinion that doors should be provided.

The decision arrived at by the Committee in connexion with this matter is shown in the following extract from its Minutes of Proceedings :—

Senator Needham moved—That doors be provided for the Vehicle Stores.
Seconded by Mr. Bamford.
The Committee divided on the motion :—

Ayes (6).	No (1).
Mr. Atkinson,	Mr. Mathews.
Mr. Bamford,	
Mr. Gregory,	
Mr. Moloney,	
Senator Needham,	
Senator Newland.	

And so it was resolved in the affirmative.

24. The design of the doors of the Vehicle Stores at Liverpool which consist of two double-leafed doors having a total width of 16 feet did not commend itself and it is the opinion of the Committee that double doors, framed ledge, 8 feet high by 9 feet wide, be adopted for the Vehicle Stores at Seymour.

25. As regards the location of the Vehicle Stores the Committee is of opinion that the five buildings to be erected should be to the eastern boundary of the site proposed to save the necessity for filling which would be required to build towards the western boundary and that instead of being erected 10 feet from the roadway on the southern boundary as proposed they be located 50 feet from the roadway. The Committee also considers that in connexion with the loading and unloading of vehicles it would be a convenience if a short ramp were provided, and recommends accordingly.

Equipment Stores.

26. The Committee gave careful attention to the matter of these buildings in view of the importance and value of the stores to be housed therein, and, after hearing the evidence, approved of the two stores as proposed and designed by the Department.

The decision arrived at by the Committee in connexion with this matter is shown in the following extract from its Minutes of Proceedings :—

Mr. Gregory moved That the two Equipment Stores as proposed and designed by the Department be approved.
Seconded by Mr. Bamford..
The Committee divided on the motion :—

Ayes (6).	No (1).
Mr. Atkinson,	Senator Needham.
Mr. Bamford,	
Mr. Gregory,	
Mr. Mathews,	
Mr. Moloney,	
Senator Newland.	

And so it was resolved in the affirmative.

27. It was ascertained in evidence that no provision is included within the Stores for fire sprinklers, reliance being placed on the hydrants to be installed between the buildings and chemical extinguishers inside. The Committee is, however, of opinion that in view of the nature and value of the materials to be kept in the Equipment Stores it would be advisable to install in such buildings a system of sprinklers and recommends accordingly.

The decision arrived at by the Committee in connexion with this matter is shown in the following extract from its Minutes of Proceedings :—

Senator Needham moved—That sprinklers be installed in the two Equipment Stores buildings.
Seconded by Senator Newland. .
The Committee divided on the motion :—

Ayes (6).	No (1).
Mr. Atkinson,	Mr. Mathews.
Mr. Bamford,	
Mr. Gregory,	
Mr. Moloney,	
Senator Needham,	
Senator Newland.	

And so it was resolved in the affirmative.

28. In regard to the location of the Equipment Stores the Committee learned that the intention is that the two stores now proposed are to be placed on the northern side of the proposed railway siding leaving space on the southern side of the line for two future stores if found necessary. The Committee considers that the first two stores to be erected should be placed parallel and opposite to one another, one on each side of the line when it might be possible to save a certain length of railway siding.

29. The Committee also considers that where any space occurs between the ground and the floor level of the Equipment Stores such action should be taken as will effectively prevent persons from going underneath the stores or rubbish accumulating there.

Caretaker's Cottage, Etc.

30. The Committee approves of the proposal to provide housing accommodation for a caretaker. In additon it is considered that it would be wise that provision be also made for a luncheon and smoke room for temporary and other employees.

31. The Committee visited the "Kaustine" factory and was favorably impressed with the "Kaustine" system of sanitation and approved of its adoption as proposed.

Water Supply.

32. Careful attention was given to the important question of water supply and the possibility of it being necessary to provide for a large daily consumption under certain circumstances. The matter was gone into not only in connexion with the site at Seymour, but also in connexion with the sites at Kilmore and Broadmeadows. The subject was considered not only from the point of view of the store site but also as to the possibility of providing an adequate supply of water for training and concentration camps. The condition laid down by the Department of Defence in connexion with this latter proposition was for a supply of 200,000 gallons of water per day for six months in every year—that is for the ordinary Citizen Force training– with the possibility of requiring 700,000 gallons a day for a period of twelve months for a Concentration Camp.

33. Of the three sites Seymour is easily the best in regard to water supply. The present supply for Seymour comes from practically virgin country of a granite formation. On the Falls Creek, which has a watershed of 4,400 acres, is a reservoir having a capacity of about 16,500,000 gallons at a level of 1,414 feet. From this reservoir the water is led by a 7-inch pipe to a service reservoir of about 700,000 gallons at Wallis Hill at a level of 636 feet, from which the Town of Seymour is supplied. In addition a subsidiary supply is guaranteed by a pumping plant which has been installed on the banks of the Goulburn River and which is capable of lifting 30,000 gallons of water per hour.

34. To provide the water required at the store site, which is not at present so much a matter of quantity as of pressure, it is proposed to lay a 6-inch pipe from Wallis Hill reservoir, a distance of about 8,000 feet. Hydrants will then be provided with 4-inch pipes from the 6-inch pipes, two hydrants between each Vehicle Store, and one hydrant to each Equipment Store. Each hydrant will be fitted with 100 feet of canvas hose ready for immediate use. The estimated cost of this work is £4,650.

In order to provide a water supply of 200,000 gallons per day for the camp area it was stated that it would be necessary to spend a further sum of £8,000, or a total of £12,650.

For a 700,000 gallons supply it would be necessary to expend a further sum of £7,000 —£5,000 on an additional storage reservoir at Falls Creek and £2,000 in duplicating the pumping engine on the Goulburn—thus making a total of £19,650.

35. At Broadmeadows it is estimated that to supply 200,000 gallons a day would cost £24,500, including reservoir, while a supply of 700,000 gallons a day would cost at least £43,000.

36. At Kilmore the costs are given—for a 200,000 gallons supply approximately £40,000, and for a 700,000 gallons supply £54,000.

37. The Committee was informed that the local Water Trust had not yet been approached in the matter of supplying any water from the Seymour water supply, but it was stated in evidence by members of the Trust that the Railway Department is at present drawing water from this supply at a price of 6d. per 1,000 gallons and that the Water Trust would be willing to supply any water required by the Commonwealth at the same rate.

38. The Committee arranged for an analysis of the Goulburn River water and the Falls Creek supply and the Commonwealth analyst reported that "the two waters are suitable for use as boiler waters and the chemical anaylsis did not disclose any bad features in respect of use as potable water."

39. The Committee is therefore satisfied that satisfactory and economical arrangements can be made for the supply of any amount of good water likely to be required at Seymour.

Railway Siding.

40. The Committee examined the plans of the proposed railway siding, traversed the route of the line and obtained evidence from the Chief Engineer for Ways and Works of the Victorian Railways. It was ascertained that the route selected offers no engineering difficulties, that the line would be constructed by the Victorian Railways Department at the cost of the Commonwealth, and that the usual conditions in respect of maintenance and charges would have to be observed as in the case of private sidings.

41. The Committee appreciated the necessity of having a railway for the handling of the materials to be stored at this place, and the saving that could be effected in erecting the buildings themselves if this railway were in existence. It is therefore of opinion that the construction of this railway should be put in hand at the earliest possible moment so that it might be possible to make use of it during the construction of the buildings.

42. Though not coming within the terms of the reference under consideration the Committee, having in mind the adoption of Seymour as a permanent training camp, gave some attention to the economy which could be effected and loss prevented if the stores needed for any large body of men on the camping area could be taken to that area by rail instead of having to be carted from the Seymour railway station. After the investigations it was able to make, the Committee is of opinion that, while the siding to the Mobilization Store area is being constructed, consideration should be given to the advisability of continuing such line to the present Seymour Camp.

Acquisition of Additional Area.

43. Some evidence was placed before the Committee as to the possibility of further land in the vicinity of the mobilization stores being required for ammunition storage depots, and, although no definite details were obtained, the Committee considers that if such additional area is contemplated steps should be taken to acquire at the one time the whole of the area likely to be required so as to anticipate any inflation of prices of adjoining land likely to result from the establishment of Commonwealth activities in the vicinity.

SUMMARY OF RECOMMENDATIONS.

44. Briefly summarized the recommendations of the Committee in connexion with this matter are :—

(i) that the site selected at Seymour for the erection of the Stores be adopted ;
(ii) that the provision of Five Vehicle Stores be approved ;
(iii) that the Vehicle Stores be located towards the eastern end of the site proposed ;
(iv) that the Vehicle Stores be placed 50 feet from the roadway ;
(v) that the height of the walls of the Vehicle Stores be reduced to 9 ft. 6 ins.
(vi) that the roof principals be constructed of hardwood and oregon in accordance with the departmental suggestion ;
(vii) that double doors be provided for the Vehicle Stores, framed ledge, 8 feet high and 9 feet wide ;
(viii) that Two Equipment Stores as proposed and designed by the Department be approved ;
(ix) that these two Stores be erected parallel to one another and one on each side of the proposed railway line ;
(x) that sprinklers be installed in the Equipment buildings ;
(xi) that any space between the ground level and the floor of the Equipment buildings be enclosed ;
(xii) that a short ramp be provided for unloading vehicles ;
(xiii) that the caretaker's cottage be approved, but that provision be also included for a luncheon and smoke room for temporary and other employees ;
(xiv) that the "Kaustine" sanitary system be installed ;
(xv) that the railway siding be constructed from Seymour to the Equipment Stores ;
(xvi) that any additional land necessary be acquired now rather than later.

H. Gregory

H. GREGORY,
Chairman.

Office of the Parliamentary Standing Committee on Public Works,
31 Queen-street, Melbourne, 9th June, 1920.

MINUTES OF EVIDENCE.

(Taken at Melbourne).

TUESDAY, 4TH MAY, 1920.

Present:

Mr. Gregory, Chairman;

Senator Henderson,	Mr. Mackay,
Senator Needham,	Mr. Mathews,
Senator Newland,	Mr. Parker Moloney.
Mr. Atkinson,	

Percy Thomas Owen, Director-General of Works, Department of Works and Railways, sworn and examined.

1. *To the Chairman.*—The plans I have submitted to the Minister for Works and Railways are those now before the Committee. The project submitted to the Minister by the Department of Defence is to erect store buildings for the housing of equipment for mobilization and vehicles, as distinct from Ordnance stores. The site selected is about 70 chains from the Seymour railways yards, to the north-east, and is shown in the inset on the lay-out plan. The site was selected by the Department of Defence, after consideration by the expert officers, having in view the distribution of troops in Victoria for mobilization. One of the factors which led to the selection of the site was the desire to get close to the mobilization centre at Seymour, because part of the equipment to be housed in the proposed buildings will be transferred to the camp of concentration upon mobilization. The responsibility for the final selection of the site rested solely with the Defence Department, although the Department of Works and Railways supplied to that Department information, particularly as regards water supply, which became factors in the selection. The principal officers of the Defence Department to whom the Committee can look for evidence regarding the selection of the site are the Chief of the General Staff (Major-General White), the Quartermaster-General (Brigadier-General Forsyth), and his immediate subordinate, the Director of Ordnance Stores (Colonel Wilson). I know that other sites were considered by the Defence Department; but the deliberations regarding them were entirely military. The proposed buildings have been planned in accordance with the lay-out supplied by the Defence Department, and that lay-out is based on the probable exigencies when mobilization occurs. I am informed that the actual floor area of the proposed buildings is only a portion of what it is anticipated will ultimately be required. The Defence Department was given information from London as to what space would be required; but it has held back from providing the whole of that accommodation until it receives the stores, and determines, on their actual storage, what further space will be required. I understand, however, that the present proposal will meet the Department's immediate demands. The buildings proposed at this stage are two equipment store sheds, each of 30,000 super. feet of floor area, and five vehicle store sheds, each of 30,000 super. feet of floor area, or a total floor area of 210,000 super. feet, with one cottage as quarters for the caretaker. There is also a connecting railway siding from Seymour, and the loops for the service of the equipment buildings. The proposal is to erect buildings of simple type, and galvanized iron on wood framing has been selected as the type which will meet requirements, and which can be erected with the greatest speed. Other proposals were considered, such, for instance, as the use of brick or concrete. The disabilities in the way of erecting in brick at Seymour would be at any time considerable, the output of bricks there being very small, and to take them from Melbourne would be expensive, and require time. There was also the difficulty of obtaining bricklayers; and altogether the brick proposition did not commend itself. Concrete was considered, but the time involved in concrete construction was a difficulty, and it was thought that the cost would be greater than that of the proposed galvanized iron construction. The Defence Department is satisfied with the erection of the buildings of the type shown on the drawings submitted to the Committee. These drawings disclose that the equipment store buildings are raised platform height above road-level and railway track level. The railway tracks serve directly only the equipment store buildings. The vehicles which will be stored in the vehicle sheds will, in part, go away on their own wheels, and in part may be trucked; but the essential point was to get the railway tracks to the equipment store buildings. The dimensions of the buildings have been the subject of a great deal of thought and discussion in the Defence Department, and with the Department of Works and Railways. It is believed that the type shown on the drawings for vehicle sheds gives efficiency in the storage of vehicles. The Defence Department asked that these sheds should be put up in one clear span of 100 feet; but it was pointed out that the cost would be considerably increased by putting up trusses with one 100-ft. span; and the Defence Department agreed to the sheds being erected each with two 50-ft. spans. The section on the plan shows, therefore, two 50-ft. spans, with a row of posts down the centre of the shed, instead of one 100-ft. span. The equipment store sheds, on the other hand, are erected with bays of 25 feet across the buildings, and 16-ft. centres on the length of the buildings. For the equipment store sheds, it is proposed to provide sliding doors, and a clerestory or lantern light extending the whole length of the building. It is not proposed to provide doors for the vehicle sheds, but one side of each shed for its whole length is to be left completely open. It is further proposed in the vehicle sheds that the galvanized iron shall not reach to the ground level, a space being left for practically the whole length of the building for air circulation. A space is also proposed under the eaves of these sheds for the same purpose. It is proposed to floor the equipment store sheds with hardwood, and the vehicle sheds with brick on flat, laid on sand and grouted with cement. The alternative would be concrete floor for the vehicle sheds; but this would cost slightly more, and the chief architect strongly

advises the brick floor. I think a brick floor, properly laid on sand, will sustain the load of any vehicle likely to be stored in these sheds. It is proposed to store in the equipment sheds rifles, personal equipment for soldiers, and camp equipment—such as tents, cooking utensils, &c., tools for entrenching work, harness, saddlery, and pack saddlery, tools practically of all trades, blocks and tackles, signalling, survey, and drafting stores and instruments, field hospital stores, blankets, range-finding stores, machine guns and mountings, batteries, cables, and electric stores generally, field telegraph and telephone stores—including wireless, bridging material, miners' tools, and water supply stores. It is proposed to store in the vehicle sheds field artillery guns, carriages, waggons, and limbers, carts and waggons, and spare parts. I do not know of any proposal to store there heavy armament, such as guns of position. I submit to the Committee detailed quantities and estimates for all the proposed buildings and works. The estimated cost of each equipment store is £10,700; and of each vehicle store, £6,500. To these estimates must be added latrine annexes, with the Kaustine system of disposal, at £145 per annexe. These estimates do not include fencing, roads, water supply, railway connexion, and so forth. The cost of the buildings has been estimated on quantities, and not per super.-foot. The distance between the vehicle stores from the front of one store to the back of another is 120 feet, and the distance from the northern end of the vehicle stores to the southern side of the platform of the equipment stores is 99 feet. I think that is ample distance in case of fire. It would take a pretty strong wind to carry a fire across. The area of the site proposed for the buildings under consideration is 47 acres 1 rood 28 perches, but the Defence Department is still considering what area, if any, shall be acquired adjoining the site for these buildings. I am to go to Seymour with Colonel Wilson on Wednesday night to finalize the views on that subject. There are other accessories in regard to mobilization which I understand may be located adjoining these stores. For instance, stores for small-arm ammunition and field-gun ammunition may be required there. It will be seen that the wood-frame buildings are shown on the drawings as having jarrah story posts. There may be some difficulty in carrying that into effect, because of the present state of the timber market. It will be difficult to obtain sticks of the length shown, and, having in view the urgency for carrying out this project, we may be constrained to use some other timber. The urgency of the job is a very important factor. I understand that some of the equipment is shortly to leave England, and these are large buildings, away from a centre. We shall have difficulty in providing buildings by the time the first equipment arrives. The Committee may ask why the matter was not decided earlier. I cannot answer that myself, but I know that many questions affecting the defence of Australia had to be considered by officers of high rank before this final location was made. I presume the Committee will ask the high military officers for the reasons which led to the selection of this particular site as a point of concentration. In view of what I have told the Committee regarding the difficulty of getting timber, I propose to advise the Minister that we should give tenderers the option of offering timber other than jarrah. The only way to do the work quickly is to give contractors and timber firms the freest hand possible, on the same lines as I did for a concentration camp in the Federal Territory. In that case I was given the necessary power, and I selected firms which I thought were capable of doing the work quickly. I got quotations from them, but I allowed them to stipulate the timber that they had in stock, or that they could get, as the timber they would use. That had the result of avoiding the cornering of any part of the structures required, and only in that way could we get close on 3,000,000 feet of timber in the time we did. A practice very much on the same lines will have to be adopted for these buildings. They are not to be wholly of hardwood; the rafters and roof members are to be of oregon, and the standards, or story posts, of jarrah.

2. *To Senator Henderson.*—I anticipated difficulty in getting jarrah. The amount held on this side is limited, and we require long sticks. The course I was suggesting would avoid any man who holds jarrah cornering the job. In view of the urgency of the work, I should also like to accept two of the lowest tenders, if there is not too big a gap, so as to get a good start with more than one building. I know the Western Australian Government hold large jarrah forests, but I apprehend difficulty in getting shipping to bring the jarrah across.

3. *To the Chairman.*—If jarrah is not available, we shall have to consider offers of Victorian hardwood or oregon. I would prefer to use jarrah on the job if we can get it, but the urgency is such that we may have to take other timbers. My proposal is to advise the Minister to submit the structures for competitive tender. I have not the papers with me to show when the requisition for this work first came to the Department of Works and Railways from the Department of Defence. I think it was about six weeks ago. We had then, of course, to get the drawings out, and they were put in hand immediately. I can ascertain definitely and let the Committee know when the matter was first referred to us. In carrying out this work, I think we should endeavour to get as much as possible of the structures, particularly the framing, made in the shops in Melbourne beforehand and sent up ready to erect. That, of course, lies, to some extent, with the contractors, but it would be an advantage to avoid as much as possible the use of large quantities of local labour. It would be better to have the framing made by machines in Melbourne than to have a large number of men working locally at Seymour on its preparation. I have not yet submitted to the Minister any recommendation regarding policy. The plans disclose that in addition to the building construction there is a considerable amount of grading, and a fair length of road-making to be done. It is not proposed to gravel or metal the areas between the vehicle sheds, or between them and the equipment sheds, except that in the latter location a road 24 feet wide is proposed, extending along the southern side of the equipment sheds. The military authorities consider that the use to which these buildings are to be put is not such as to warrant a large expenditure on gravelling the space between the equipment sheds. So far as I know, the proposition is that the vehicles will be taken to the vehicle sheds, stored there, and inspected, and the wheels turned occasionally; but they will not be taken out except for concentration of troops at Seymour either on mobilization or for civilian training. This is, therefore, a different proposition from a vehicle shed where the vehicles are going in and out every day or every week. In addition to the road making, it is necessary to get rid of the surface water, and it is proposed to accomplish this by means of concrete surface drains shown on the lay-out plan. It is also proposed to lay a water service for fire hydrants, the service to be sunk and to be distributed between the buildings as shown in blue on the lay-out plan. The estimate of cost which I hand to the Committee gives details of the size of the pipes, and what it will cost to carry out the service. The Committee may wish to know a little more fully what factors were considered, or what matters investigated,

by the Works Branch to assist the Department of Defence in deciding where the point of concentration, and with it the mobilization and vehicle stores, should be. One of the principal factors was water. We were told that the volume of water required on mobilization would be 700,000 gallons per day over an indefinite period, and that, apart from mobilization, there would be an annual training of civilian forces for which 200,000 gallons per day would be required. The Defence Department did not tell us the number of days for which the 700,000 gallon supply would be required, but they said that mobilization might be for a considerable period, possibly for months. In fact, we had to look on it as almost a perennial supply, under bad conditions of rainfall. The first location we were asked to give information concerning was Broadmeadows. We found that there the supply could be effected from the Melbourne water supply, but that it would be necessary to expend £43,000 to secure 700,000 gallons per diem, and £33,000 to secure 200,000 gallons per diem. Broadmeadows, during the war was supplied by a branch pipe from the main which leads to Preston, but that could not be relied upon for the supply of this large volume of water. At times the draw-off in the Preston main is such that very little can be got at Broadmeadows. As a consequence of that, it would have been necessary to erect at Broadmeadows very large storage tanks on a high level, and there, again, we were confronted with the available head in the Preston main. I know that there were other factors which bore on the selection or otherwise of Broadmeadows. The railway connexion there would have cost very much more than at Seymour, according to the last scheme which I heard discussed, which was to bring the loop or siding from Broadmeadows Station across to the suitable site for the equipment buildings at Broadmeadows Camp. There was an alternative project of a shorter siding to a site close to Broadmeadows, but that would have, in its turn, involved a difficult question of water supply, and I understand that other factors combined to bring about its rejection. The next site upon which we were asked to give advice was at Kilmore. There the catchment area was not satisfactory for a supply of 700,000 gallons per day over a protracted period. There is a small supply at present at Kilmore, but it would be necessary to lay an additional 7-inch main from the Kilmore Water Supply Works, at a cost of about £40,000, and even at that it could not be regarded as a satisfactory supply for the large consumption which would occur during mobilization. Another factor which came under our notice at Kilmore was railway connexion. The best site that we saw there for the equipment and vehicle stores was somewhat difficult to get at, because of an up-gradient to Kilmore. It would also have involved another difficulty, which is not going to occur at Seymour, in connexion with the points and signals, because it would have meant a take-off between Kilmore Junction and Kilmore. Another matter that came under our notice at Kilmore was the cost of the land. The site which was most suitable for these sheds was valuable, whereas I understand that the land selected at Seymour is not valuable. It is poor land, and the only value which could be put on it would be for building purposes. The Committee will see when they visit Seymour that there is still a large area of other land available for building. An estimate was not prepared of the cost of the work at each of these places. When it came to the question of water supply, it was no use going further, so far as we were concerned.

4. *To Mr. Mathews.*—The cost of the water supply at Seymour is included in the total estimated cost of £75,000.

5. *To the Chairman.*—It is proposed to draw water from the service reservoir of the Seymour town supply by a 6-inch pipe line of about 8,000 feet in length. The estimated cost of the water supply and fire service is £4,650. There is no doubt in my mind that the supply of water at Seymour is gilt-edged. The Goulburn River can be pumped from as an emergency, in addition to the ordinary supply. There are already two pumps, and a 12-inch rising main from the Goulburn River installed. Those pumps are capable of delivering 30,000 gallons per hour, so that there is no doubt that the volume of water required, or more, can be obtained.

6. *To Senator Needham.*—I understand that that installation was used for the Australian Imperial Force camp, but I think it was there before that camp was formed.

7. *To the Chairman.*—I erected the mobilization stores at Liverpool. The question of a feasible railway connexion at Seymour was first of all dealt with by the military authorities in direct touch with the Victorian Railways Commissioners, and an assurance was given that the railway siding could be made. Since then, it has been referred to the Engineer for Way and Works, Victoria, and he has been good enough to take very quick action. A survey has been made, and yesterday I saw the section, which discloses that there is quite an easy location from the Seymour yards to the site, the heaviest grade being 1 in 100.

8. *To Senator Needham.*—The actual road length is 70 chains, but when the loop lengths are added the total is about 110 chains. The Engineer for Ways and Works is now preparing his estimate. I have tentatively included an amount of £3,000 for a railway siding. That estimate may be increased, but I do not think it will be decreased.

9. *To the Chairman.*—It is proposed that the Victorian Railways Commissioners shall construct the siding. It is really a private siding to their railway system, and, I presume, will be maintained by the Victorian Railways Commissioners at the expense of the owners of the siding. I have not dealt with the conditions under which it will be used. I presume that matter will be considered by the military authorities.

10. *To Senator Newland.*—The lay-out plan, which is on a scale of 2 chains to the inch, shows that the site is bounded on the south by a main road, along which are distributed seven building sites. Upon five of these it is proposed to erect buildings forthwith. To the north of the vehicle sheds, and running approximately east and west, is the railway siding, which approaches from Seymour on the west. The railway siding will consist of three tracks, and to the north and south of these tracks will be distributed the equipment store sheds. Five are shown on the lay-out plan, but it is proposed to erect only two at the present juncture. The two which it is proposed to erect now are shown in dark colouring, but it is just possible that to meet military requirements the two to the north of the line may be erected first. The plan shows the ground-level by contours at 2-ft. intervals, which, coupled with the scale of the plan, gives the grades. The grades are all easy, as there is very little steep land in the site. The steepest part falls 4 feet in about 75 or 80, or, say, 1 in 20, but that is only a very limited portion of the whole area, and it is not proposed at present to build over it. In fact, if another equipment store is required, in addition to the five shown on the plan, it may be kept a little further to the east to avoid the comparatively steep area just referred to. It is proposed to acquire for the present purpose the whole

of the area edged with pink on the plan, down as far south as the main road, although the part along the main road is not so coloured. That area is the 47 acres odd already mentioned. The vehicle sheds are shown on the lay-out plan as abutting on to the road, but it is proposed that they shall be kept back 10 feet from the fence.

11. *To the Chairman.*—The plan also shows the water supply, with branches, and the surface drains are indicated by green dotted lines.

12. *To Senator Newland.*—The grading is shown in light sienna, and the proposed road in dark sienna. The equipment store building is shown on a plan scaled 16 feet to the inch, and by a detailed section on a scale of half an inch to the foot. The drawings disclose that the roof is trussed, although not in clear spans. There are three intermediate posts in the width of the building, to reduce the size of the members in the roof trusses. I understand that there is no serious objection to these posts for the equipment shed. Probably the military authorities would like an absolutely clear floor, but, on the other hand, the equipment can be stored around the posts, and the posts do not interfere with the proposal. It is proposed to introduce light in the equipment sheds by what may be called an extended lantern. It is necessary to have a considerable amount of light in these stores. The alternative was to put corrugated glass in the roof, but there are objections to getting direct light on to some of the classes of goods to be stored there. Although the corrugated glass would effect economy, the value and importance of the stores to be held there warrant the extra cost of providing light by the method shown on the drawings. Sliding doors are proposed for the equipment sheds. These have been evolved in the light of experience as not interfering with floor or platform space. It is proposed to divide each equipment store into two compartments by a brick wall, to reduce the fire risk. This wall will extend through the roof, the walls, and the floors. The form of truss is by members bolted through and through. The vehicle shed is a very simple proposition. There are no side windows, and the building is of plain galvanized iron, consisting of two long ridged bays, with centre story posts supporting the whole roof structure. This is shown on a small scale in cross-section. The half-inch detail shows the proposed method of construction. In this building also it is proposed to provide a cross-wall to divide the building into two compartments, with a view to minimizing fire risk. A space of about 2 feet is left between the floor and the bottom edge of the galvanized iron wall, at the request of the military authorities, who desire a free current of air for ventilation for these vehicles. I understand that when they determine in what buildings and in what parts of those buildings guns will be put, some extra provision may be made to protect the guns from the weather by erecting partitions and doors. For the caretaker's cottage, one of the plans adopted for the Lithgow housing scheme was taken. It is a small brick cottage, but I understand from Colonel Wilson that the man who will be placed in charge may be a foreman, and that he will require another room. I believe that the man who has to live in the cottage at Liverpool considers it too small. The estimated cost of the cottage as now proposed is £765.

12A. *To Mr. Parker Moloney.*—It comprises living room, two bedrooms, kitchen, laundry, bathroom, and closet.

13. *To the Chairman.*—It is proposed for this cottage to adopt the Kaustine system instead of the pan system or septic tank. Under normal conditions, the septic tank would not be warranted. I presume that during mobilization the military authorities will take steps to provide the ordinary camp latrine accommodation. The Kaustine system is an American patent, and it is claimed that one charge is sufficient for a four-roomed cottage for six months. It is contended that it is absolutely odourless, and in every way a sanitary proposition. I went out to see that patent, and saw one that was in use. I must say that not the slightest smell was noticeable. I think it a very good proposition for a small detached house such as is proposed; although, in the case of a large group of houses, where slop-water and bath-water has to be got rid of, the septic or sedimentation system would be better. In this case, I think the Kaustine is the proper system to provide. It can be installed right inside the house. I cannot say whether the area mentioned is the total that will be required. I do not think it is; but it is the total area required to start this work for the vehicle and equipment sheds. The area has not been acquired, and notification has not been given to the owner. I asked the Surveyor-General about the price, but he was reluctant to state it. No price has been put on the land, but it is not high. The area is at present being utilized only as a paddock. The Liverpool buildings are not of the same design. The designs now submitted to the Committee have been evolved on more mature consideration. They are bigger buildings than we put in at Liverpool, and the construction is different. Since the buildings were erected at Liverpool, we have seen the possibility of improving the plans. For instance, at Liverpool the vehicle sheds have more posts; that is a disadvantage, and we have decreased their number. The Defence Department asked us to put it in one clear span, and we compromised on that by putting one row of posts down the centre. The first vehicle building at Liverpool had doors, but they were not altogether a success. They were made very light for the sake of economy, and now the Defence Department wants no doors at all. I cannot give the Committee any idea of the value of the goods to be stored in the equipment sheds. Machine guns will be very valuable, and very important from other points of view. I regard these as permanent works, suitable for containing valuable goods. The fire risk is not in the structure itself, but in the contents. If we put up a more fire-resisting building, the fire risk would not be very much lessened in these large areas, because the contents are the danger, and that entails watching and care. I should say that in that locality the life of the buildings we propose to put up will be 30 or 40 years. I think the class of building is quite efficient for the nature of the goods. I regard it as quite a satisfactory proposition. If we could have done it, I would have preferred to do it in brick, like the class of building that we erected at Geelong for the woollen mills. Those are better-class buildings, but, of course, they would cost more, and take much longer to put up. As regards the possibility of erecting concrete buildings, time and expense have to be considered. I would not recommend for this equipment a single thin slab of concrete. It would be necessary to have a rain-resisting wall, and I do not regard slabs of concrete, without cavity, as a good proposition. If it is to be a cavity wall, it is going to be an expensive job to put up. I would not advise a solid concrete wall, but of course it would depend on the thickness. Six inches would not be enough. If 8 inches was decided on, it would be adding to the expense, and even then the concrete would have to be very good. Gravel which will make very good concrete can be obtained locally, although it is water-worn gravel, and for anything in the way of reinforced work I would not care very much for the water-worn stuff. For ordinary gravity concrete, however, it is excellent. It

is quite a moot point whether we should not put down the floors of the vehicle sheds in concrete instead of brick. Even if it was not a question of urgency, I think I would recommend a wood and galvanized-iron building for this proposition. Taking a fairly long view, this may be regarded as a permanent proposition for this purpose, with a life of 30 years, or probably more. We do not know what changes there may be in the future in strategy, or in the strategic disposition of troops. There is no danger of floods on the site. No inquiries have been made as to the ravages of white ants. I would not regard that as a great danger. I have seen no indication, or very little indication, of white ants in that district. It is proposed to set the main posts in concrete. If the space between the buildings is not gravelled, there will be a possibility of the grass growing long, but it will have to be kept cropped. Grass would be a good thing to bind the surface, and it would not add to the first risk if cut short. I suppose the matter of urgency, to some extent, affected me in recommending buildings of this sort as permanent structures. If we had any amount of time, and bricks were cheap and bricklayers available, we might put up a brick place. What is now proposed is quite lasting enough, and quite a good enough proposition for the purpose. We have recently bought a large quantity of galvanized iron at a considerably lower price than the present market quotations. Even with stone, sand, and gravel available locally, a concrete building would cost more than the proposed building. A concrete building might last longer, but the roof in these buildings will last as long as it would in a concrete building. I feel sure the galvanized iron will last well in that district away from the coast. I have never regarded Victoria as an area in which any serious danger need be apprehended from white ants. There is to be no artificial lighting. I presume that during mobilization the military authorities will install a temporary lighting plant. The water supply available is of good quality. We have made no test of it, as we assumed that the Seymour supply was quite good. There is no doubt of its efficiency; and in the case of any emergency during mobilization, the horses could be watered at the Goulburn River. The only road to be made by our Department is shown on the lay-out plan. The roads outside leading to the area are good, and there is excellent road-making material available at Seymour. I hope to be able to get the estimates for the railway connexion within a week from the Engineer for Ways and Works.

14. *To Mr. Atkinson.*—Oregon is very dear at present, but it is a matter of what we can get, and we know we can get oregon in long sticks. If we wanted mountain ash, the wood we should get is probably growing in the trees at the present moment. Oregon is more expensive than local hardwood, but time is the essence of the contract. We shall have to take what they can give us, in order to get the first building up quickly. Australian hardwood is a pretty wide term. I prefer some Australian hardwoods to oregon for certain purposes. West Australian karri is magnificent for roof members, and some of the eucalypti from the eastern States are excellent for strength and durability. There are quantities of oregon at present on the market, and it is a very light and effective wood for roof members. We shall try to get Australian wood if possible. We would not take other woods if we could get Australian woods for story posts, studs, and frames. In a job of this sort, we call for public tenders only in Melbourne. It is not the sort of job that we would expect a Queensland contractor to come down and do. Karri would be excellent for the roof; but I do not think we have any hope of getting it. It is a heavy timber, but excellent for roofing purposes.

15. *To Mr. Mathews.*—I intend to recommend the Minister to take different woods for different buildings if we can expedite the work in that way.

16. *To Mr. Atkinson.*—The state of the timber market is by no means reassuring. I should like the preparation of the roof members, and other parts of these buildings, to be accomplished in the mills at Melbourne with labour-saving plants, so that they could be taken and erected straight away at Seymour. That would be an economical plan. I have done it in other works. This is a typical job for doing it, because there is so much repetition. For instance, 340 roof-truss members of exactly the same type will be required. That is a repetition job, and that is where the mill comes in. It is difficult to say whether any saving could be made by delaying construction for a few months. We do not know what is going to happen about wages and conditions of labour. The fact that we have to press on the work now will not make it cost more, unless we are forced into overtime. Our experience is that by pressing a job on we are more likely to economize in the actual construction.

17. *To Senator Henderson.*—We are searching for seasoned timber, but we are not likely to get it. It is practically impossible to get seasoned hardwood. If we are to get the timber for these buildings locally, it possibly now in the trees. It would be as easy to get a supply of karri from the Western Australian Government as timber from any other part of Australia, if we could get the shipping. I had correspondence with the Western Australian Government regarding karri some months ago, when we had a probability of constructing aerodromes. I do not think the price quoted by the Western Australian Government was "anything to write home about," but we could have got the timber, and the only difficulty would have been the shipping.

18. *To Mr. Parker Moloney.*—The principal reasons for not using brick for these buildings were urgency and cost. Brick is not an easy proposition at Seymour, where there are only a few small open kilns. I did not estimate the difference between the cost of brick buildings and this proposal. I discussed the question with my officers, and we turned down the brick idea as being, without doubt, a much more expensive way of doing it. The cost of bricklaying is high, and there is also the difficulty of getting bricklayers, and of bringing bricks up to Seymour. I do not think we have any chance of getting bricks at a reduction in the same way as we have got galvanized iron, unless we burn them ourselves. The price of bricks in Melbourne is now high. I did not see my way to undertake the brick proposition, and so we never estimated the cost.

19. *To the Chairman.*—Mr. Murdoch could supply general estimates of the costs in brick and concrete.

20. *To Mr. Parker Moloney.*—We did not take out the quantities of brick. The land at Seymour is cheaper than that at Broadmeadows. The water supply was one of the objections to Broadmeadows. Another was that the soil is black volcanic, and experience has shown that it gets into a deplorable state of slush after a few days rain. It would be quite hopeless to try to improve the surface with metal or cinders for a large concentration camp. I believe the Broadmeadows Camp fulfilled its purpose as a war proposition for the raising of the Australian Imperial Force, but it would not be satisfactory as a point of concentration. For the floors of the vehicle sheds, concrete would be a little more expensive than brick. I have a slight doubt whether brick on flat, although it is grouted, would not show a gradual displacement with heavy vehicles standing in

the one place for a long time. Still, if the bricks are bedded thoroughly and well on sand, and grouted, they make a very fair foundation, and I think the floor suggested will be all right. Mr. Murdoch is very keen on the brick floor, but if the concrete and brick were the same price, for this purpose, I would put down concrete. The Works Director told me that he estimated the cost of concrete from the local gravel at 9s. per square yard; whereas the brick floor would be only 6s. 6d. That would influence me in favour of brick.

21. *To Mr. Mathews.*—A brick floor is more easily repaired than a cement floor. On the other hand, there will be so little traffic in this case that concrete would be quite satisfactory. I do not think we should be justified in paying the extra money for concrete.

22. *To Mr. Parker Moloney.*—Any local timber that we use will probably be green. The same condition obtains right through the building trade; but I do not think it will affect the stability or the life of a building of this kind very much. In higher-class construction, timbers shifting about after they are put in may cause difficulties; but they will not matter very much in this case.

23. *To Mr. Mathews.*—As between Broadmeadows and Seymour, I think that the facts that Broadmeadows is more accessible, and that a certain amount of money has been spent there already, were considered. I believe that very much more land would have been required at Broadmeadows than we have there at present. I think the water service pipe at Broadmeadows is only 4 inches, and there is not very much head at the back of it. The unfavorable character of the soil at Broadmeadows was corrected in parts by the use of ashes, but it would be necessary to cope with tremendous areas for a large camp for mobilization purposes. We laid tracks and roads there, but men who were there told me that they went up to their knees in places. The estimated cost of the proposed buildings is based on present prices. One of the difficulties which contractors have to face is that the cost of materials may go up after the contract is let. We make no provision in our contracts to allow the contractor to raise his figure if the cost of material rises. If contractors demand excessive prices, I am always prepared to recommend that the Department should do the work itself. We have done it in a great many cases in the last year, and in each case have done the work for less. The selected site is easy to drain, with nice easy gradients. It is not proposed to install sprinklers in the buildings, but I have not yet had a consultation with Mr. Lee on the subject of fire prevention. We did not provide sprinklers at Liverpool. I proposed that there should be proper and systematic watching for these buildings. There is no fire brigade, like the Metropolitan Fire Brigade, available; but, with a good system of watching, and hand chemicals, and hoses, I think the proposition can be made reasonably safe. Watching is the essential consideration. The contents of the buildings will be a good burning proposition; in fact, Mr. Lee says that anything will burn. I understand that Seymour is to be the mobilization site, and the manœuvre area for the Citizen Forces, in Victoria.

24. *To Senator Newland.*—The weight of a field gun and its carriage empty is about 23 cwt. I do not know where the heavier guns will be stored. I think rifles will be safe if stored in these sheds; but probably the military authorities will take steps to guard them. We have discussed the question of using reinforced concrete supports for the roof, but again time is one of the disabilities. I think we could get the reinforcing steel; but I do not know that the price would be very low. Another big factor in making both reinforced concrete and gravity concrete is cement, for which the market at present is very difficult, and the price has been going up. It takes a little time to make concrete pillars, and then they have to be seasoned. I put that proposition to my officers, and we came to the conclusion that if we did not get jarrah for the story posts the only way would be to get the best timber we could. It would take from three weeks to a month to season a reinforced concrete pillar of the size that we would want. That may not be very long, but when you have to make the pillars and then season them, it begins to spin the job out. It would be necessary to make a large number of them. It is proposed to erect only one caretaker's house. I believe there will be other men there, but they will live in Seymour. I do not think it will be necessary to have a guard at night; but there will have to be a system of watching. I should think that the watchman would be some one other than the caretaker. It is always preferable, if possible, to have a watchman under the control of the fire brigade. It may be necessary to arrange that the tell-tale for the watchman shall be at the caretaker's residence. These buildings will not be like an ordnance store, with stuff going in and coming out every day. As a rule, there will be no men working there.

25. *To Mr. Mackay.*—It is proposed to fence the area right round with four barbed wires. The estimate provides for about 96 chains of fencing and gates—posts, barbed wire, and plain wire—at £5 10s. a chain; with five pairs of gates, at £15 each; or a total of £600. The only buildings which the Works and Railways Department put up during the war for mobilization purposes were at Liverpool, and that work was actually done after the armistice. We put up an ordnance store at Keswick (Adelaide). I believe the Defence Department has a number of buildings at Seymour, but these, I understand, are all to be retained for Citizen Force training purposes.

(Taken at Melbourne.)

WEDNESDAY, 5TH MAY, 1920.

Present:

Mr. GREGORY, Chairman;

Senator Henderson, Senator Needham, Senator Newland, Mr. Atkinson,

Mr. Mackay, Mr. Mathews, Mr. Parker Moloney.

John Smith Murdoch, chief architect, Department of Works and Railways, sworn and examined.

26. *To the Chairman.*—The work of erecting mobilization and vehicle stores at Seymour has been referred to the Department of Works and Railways for plans, specifications, and estimates. It is to be carried out in collaboration with the officers of the Defence Department. That Department has selected the site, and has indicated the positions of the buildings that it requires. The site is about 1 mile east of the town of Seymour. It was selected by the expert officers of the Defence Department. After its selection, in company with a military officer, I visited it prior to commencing to prepare the building scheme. It appears to me to be an excellent site; it is readily accessible to the railway, and apparently no engineering difficulties will be encountered in taking the railway into it. The storage space required by the Defence Department to meet its present requirements is about 150,000 square feet for vehicles, and about 60,000 square feet for mobilization stores. It is proposed to meet these needs by the erection of five vehicle stores, each 100 feet by 300 feet. The requirements of the mobilization stores are to be met by two buildings, each 306 feet by 100 feet. The

method of construction to be adopted is the cheapest that we are able to devise, and it is also that which can be most expeditiously carried out. According to the information that is in the possession of the Defence Department, rapidity of construction is a factor in the scheme, because some of the stores are already on the way out here, and it is necessary to provide the requisite accommodation for them as quickly as possible. Representations were first made to me regarding this project on the 19th March last, when a letter was received from the Defence authorities asking for an estimate for the erection of the buildings required, with the accommodation that was needed, in accordance with the positions indicated in the drawings which accompanied that letter. After I had inspected the site with a Defence officer, I proceeded with the preparation of the drawings and estimates, and these were sent to the Defence Department on 10th April last. Upon the 16th April, we pointed out to that Department that everything was in readiness for the proposal to go before the Public Works Committee; and as soon as that body was created, the Minister for Works and Railways submitted the scheme for its consideration. In addition to the storage accommodation already mentioned, the Defence Department requires a small cottage for a resident caretaker. There is no proposal at present to house any other employees; and, from inquiries made of Defence officers, I do not think many men will be employed there, save in time of mobilization. Ordinarily, the number of hands will probably not exceed fifteen or sixteen, and doubtless they will be able to secure housing accommodation in the town of Seymour. The caretaker's cottage will be a small brick building, upon an exactly similar plan to the cottage which has been erected for a like purpose at Liverpool, New South Wales. Its estimated cost is £765. The construction proposed to be adopted for the store buildings is hardwood framing for the walls, hardwood and oregon pine for the roof frame, and galvanized iron for the walls and roof. The supports will be of hardwood set in concrete. The estimated cost of the vehicle store buildings is £6,500 each, and that of the equipment store buildings about £10,700 each.

27. *To Mr. Mathews.*—The equipment stores are not to be lined.

28. *To the Chairman.*—This is not the first time that the class of construction proposed in those buildings has been adopted. It has been extensively employed at Liverpool, New South Wales, and it is also being adopted in buildings which are to be utilized for similar purposes near Brisbane. It is a perfectly well known class of construction throughout Australia. Most railway buildings, goods-sheds, &c., are erected upon precisely similar lines, though not always upon so extensive a scale. The wall plate of the vehicle stores will be 11 feet high, and the roof will of course be open to the top. The distance to the apex of the roof is 20 feet. One side of the vehicle stores will be entirely open, whilst the opposite side will be partly open. This will permit of a free draught of air constantly passing through the structure, thus making the conditions tolerable for the men who work there. The two end walls will be entirely closed, the back wall will be partially closed, and the front will be altogether open. The store buildings will be entirely closed, and will be fitted with sliding doors. In the case of the vehicle stores, the flooring will be of brick; whilst in that of the mobilization stores it will be of timber. I said just now that it was not proposed to line the buildings, but the roof of the mobilization stores will be lined, so as to temper the heat. I do not think that there will be any vehicle placed in the stores which will exceed 2 tons in weight. The field howitzer will probably be the heaviest. The weight, therefore, which the floor will be required to carry is quite a negligible quantity. In my opinion, a brick floor is the best. Not only is it 30 per cent. cheaper than concrete, but it is a floor which can be readily repaired if anything goes wrong with it; whereas a concrete floor is liable to crack under certain conditions. It is susceptible to contraction and expansion under the influence of a dry or a wet spell. The Committee have seen examples of brick flooring at the Flinders Naval Base. Bricks make a really excellent floor. We could not lay down a concrete floor for less than 9s. or 10s. per super. yard, whereas we can lay down a brick floor for about 6s. per super. yard. Thus a concrete floor would cost 30 per cent. more, and would prove less efficient. It is intended to employ hardwood timbers for uprights throughout the building. At present there is considerable difficulty in obtaining supplies of hardwood. The best hardwood that we usually employ in Victoria is jarrah. But there is such a demand for it everywhere that it is difficult to get. A very large quantity of timber will be required in the erection of the proposed buildings. So far, we have made no representations to the timber-getters in Western Australia, or to the Government of that State, with a view to ascertaining whether a shipload of it could be despatched here. The idea is that the erection of these buildings may be done by contract. In that case, the task of finding the timber will devolve upon the contractor. In my opinion, the sooner we attempt to discover the best markets for the purchase of timber the better. Even if these works are carried out by contract, it may be well to insure a supply of hardwood if it is possible to do so. Already certain precautionary measures have been taken, not only on account of this work, but on account of other works that are in hand. About a month ago, we received a hint that the price of iron was likely to rise considerably. Our authority seemed pretty good, and consequently we made inquiries regarding the stocks that were held here, and the prices at which they could be purchased. We further cabled to London to learn the price of iron there, because we might possibly have desired to import it. As a result, we discovered that we could purchase iron in Melbourne a good deal cheaper than it could be bought in London. Accordingly, we purchased some 193¼ tons of it, at about an average price of £54 per ton. This iron is of various lengths; some of it is of 24 gauge, and some of 26 gauge. The prices at which we purchased it varied from £53 to £60 per ton. We purchased 15 tons at the latter figure. In England, the best quotation we could get for iron f.o.b. at Avonmouth was £57 10s. per ton, to which would require to be added £4 10s. per ton, or thereabouts, for freight. Other quotations obtained in London varied from £63 10s. to £64 15s. per ton f.o.b. Liverpool. Of course, I am speaking entirely of corrugated iron. We also made inquiries of the Broken Hill Proprietary Company, which is preparing to turn out iron, because the chances are that the very extensive importation which now takes place will be entirely obviated when that company is able to supply the Australian market, and this it hopes to do after about September next. No doubt that factor will stabilize the price of iron here. I would not care to use mountain ash in any work where it would come into contact with the ground. The shrinkage of timber is an immaterial consideration in works such as we are now considering. The hardwood supports will not really be in the ground—as I have already explained, they will be set in concrete. The Railway Department does not, I understand, allow mountain ash to be used as sleepers. We certainly would not think of using it in the ground. In my opinion, the tie beams of the roofs of the buildings in

question may require to be of oregon. That timber is preferable to stringy-bark. The biggest stick that will be required will be about 25 ft. 6 in. long, and 9 inches by 5 inches. Perhaps it will be difficult to get it in hardwood. The most economical timber to employ for this purpose is oregon pine. I have no idea of the value of the stores which will be placed in the equipment shed. I assume that the article stored will be the usual military stores, such as rifles, harness, boots, and clothing. Of course, it is necessary to provide a fairly good building, so as to prevent the weather injuriously affecting the stores. But I contend that an iron building is as good as any other structure for protecting the material that is placed within it. I considered the question of brick construction, and set it aside in favour of that proposed on account of its cost, and also because of the slow rate of progress which would be made in erection as compared with that which would be made in the class of construction proposed. Speaking from memory, I think that brick stores would cost about 10 per cent. more than would iron and wooden stores; and if we erected brick platforms instead of woodon ones 10 feet wide on each side of the mobilization stores, the increased cost would be raised to about 15 per cent. I am of opinion that a galvanized iron building will afford reasonable protection against weather to such articles as leather, valuable rifles and machine guns, and will be sufficiently strong to prevent it being broken into. If a man wishes to rob a store, he will get into it, irrespective of whether it be constructed of brick or anything else. I was resident in Queensland for many years, where this class of construction is extensively adopted, and even in that climate it is considered suitable for store buildings. It also possesses a life. The proposed buildings will be good for fifty years, and I do not think we need look further ahead than that. Of course, dust will always creep into a building through windows and under doors, and I do not imagine that much more dust will find an entrance to these buildings between the joints of the iron. The equipment stores will be built from 3 ft. 6 in. to 4 feet from the ground. It will be entirely closed right down to the floor. In my judgment, the space between the buildings is sufficiently great to prevent the risk of any fire spreading from one to the other. There is a distance of 132 feet between the store buildings, with fire hydrants between them. That is a space wider than Collins-street. There would be no danger of fire on account of grass plots separating the buildings instead of the space being gravelled, because no luxuriant growth of grass will take place there. Our Sydney office built the stores which have been erected at Liverpool. The buildings proposed to be erected at Seymour differ from the Liverpool buildings only in regard to their size. I have not seen the Liverpool buildings since they were erected, but I drew the plans for them.

29. *To Senator Newland.*—Concrete piles would prove very expensive to use, and would not serve any better purpose than would timber supports. We have not merely to consider the question of the concrete in the piles, but also the weight of them, and the difficulty of uniting the other portions of the structure with them. In making the railway connexion, it would be possible to depress the railway instead of building platforms; but on the other side of the store there is to be a similar platform served by a road, so that any proposal of that kind would involve depressing the road as well. It is necessary that the road alongside the mobilization stores should be on a level with the ground on which the vehicle stores are placed. But even if the method suggested were practicable in this case, it would be more costly than that provided for in the scheme, because retaining walls would have to be built to carry the platform. Of course, I can quite imagine cases in which the system suggested might be adopted with advantage. I know of no building which would convey a better idea of the class of construction proposed than that to be seen at Keswick, near Adelaide. The trains running to the South Australian capital pass it, so that every traveller by rail may see it.

30. *To Mr. Mathews.*—Of course, if instructed, we are prepared to undertake the construction of these buildings ourselves. We have all the essential appliances for the purpose, and on this occasion it might be a good course to follow. Otherwise we may waste a month in calling for tenders, and even then may not receive any satisfactory tenders. The difficulty of obtaining materials and labour is such that contractors must find it hard to tender at all, except upon a percentage basis. The economy or otherwise of using concrete in works of this kind depends entirely upon the conditions which obtain in the immediate vicinity. If gravel and stone can be obtained handy to any work, the employment of concrete is not such a difficult proposition. Indeed, in some cases, from the stand-point of price, it will defeat brick, but in others the brick will defeat it. In connexion with the works proposed at Seymour, the use of cement is almost impossible. As a matter of fact, any work involving the use of a considerable quantity of Portland cement is out of the question. I do not think a sufficient quantity of that material could be obtained for these buildings, and even if it could, its price would be almost prohibitive. Quite recently cement cost as much as £2 per cask.

31. *To Mr. Mackay.*—I am very familiar with the Queensland hoop and Bunya pines. But even if supplies of these timbers were obtainable at a reasonable price, I doubt whether you could get them in the required lengths. It is a big scantling for hoop pine. We use immense quantities of hoop pine for flooring purposes, and I would not be afraid of the strength of that timber. It possesses good stressing qualities, but we would have to pay far more for it than we would for oregon. I have not visited the Broadmeadows and Kilmore sites in connexion with the proposed buildings.

32. *To Mr. Parker Moloney.*—I dare say we could get different varieties of timber in Australia suitable for these buildings; but I do not think we could get them readily, and to obtain them in the sizes required would perhaps cost more than would oregon. Of course, we ought to exhaust the market before we purchase oregon. But the proportion of oregon to be used in the buildings is very small compared with that of other timber. We never use imported materials where we can avoid doing so. For years it has been our policy to encourage the use of everything Australian. In certain sizes, we could get Australian timber much cheaper than we could oregon, but for the sizes required we should have to pay fancy prices, and would probably need to make special arrangements with timber-getters. We can make inquiries with a view to ascertaining what timber is obtainable, but I am of opinion that we may have to fall back upon oregon for our tie-beams.

33. *To Senator Needham.*—We shall not be able to obtain the bricks required for flooring purposes convenient to the site at Seymour. They will have to be taken from Melbourne, and they will cost a good deal for transport. About 1,000,000 bricks will be required for the seven stores of 300 feet by 100 feet, with a drain all round them. We would call for tenders for the supply of these bricks. The price of bricks at the present time is about 57s. 6d. per thousand, whereas before the war it was only about 31s. It is not proposed to install sprinklers in the buildings, but to rely wholly on ordinary hydrants. It is not necessary to install sprinklers. The precaution has been taken to provide each building with a brick wall and a sliding fire-proof door, thus halving the fire risk in each building by making two compartments, each measuring 150 feet by 100 feet. In the event of an outbreak of fire, which is very unlikely, it would thus be possible to confine it to one compartment. I have no knowledge of the cost of the Seymour site, which, I understand, has not yet been acquired.

34. *To Mr. Atkinson.*—The Department of Works and Railways has not recently carried out as many works under the day-labour system as it used to execute. At one time, all our works were carried out under that system, but recently large works have been let on contract. We do not take any steps to secure supplies of timber until we know definitely that we have a specific work to execute. We carry no stocks of timber. The loss of capital that would result from having idle stores on hand induces me to believe that it is best for us to go upon the market when our requirements are absolutely known. It is dangerous to hold a lot of idle stores. The leakage of capital under such circumstances is enormous. We get the Minister's instruction to proceed with a work, and then we purchase our timber in the cheapest market available. No steps have been taken to ascertain whether we can get the necessary hardwood for these buildings, because the chances are that the supply of timber will become the duty of the contractor. There are Australian woods that would be serviceable for the requirements for which it is proposed to use oregon. Jarrah is one of them, but it would be very heavy for the purpose. Other timbers that would be suitable are ironbark, stringy-bark, and spotted gum from New South Wales. In Victoria, red gum would be suitable, but it would probably cost 50 per cent. more than would oregon.

35. *To Senator Henderson.*—Karri could be used for every bit of the proposed building save for timbers that will come into contact with the ground. But we could not obtain karri at anything like the price at which we could purchase Victorian hardwood. We will have to pay more than 40s. per 100 ft. for karri, whereas we can get the local hardwood at a very much cheaper rate. We have not made any overtures to the Government, which really controls the supply of karri in Australia. We can, however, inquire whether such timber is obtainable at a suitable price. But I can foresee some delay in securing delivery of the timber here. It has been very difficult to get both jarrah and karri. In fact, I was told in Perth that there was a difficulty in securing supplies even for local requirements. In Adelaide, recently, jarrah was unobtainable owing to the shipping strike. If it be a fact that a tremendous lot of timber is at present stored in Western Australia, it could be got rid of very quickly if it were sent to Adelaide and Sydney.

36. *To the Chairman.*—I have not made any investigation in regard to whether sand and stone are available at Seymour, but I think that Mr. Hill has done so. If we were to erect concrete buildings for the equipment stores it would be far cheaper to erect them of solid cement than in reinforced concrete. The thickness of the walls would be about 8 inches. In such circumstances, it would well be worth while running up a stone-breaker and mixer. But cement buildings could not be erected nearly as quickly as could wood and iron structures. I am not familiar with the process of building which was advertised recently in Hobart, and which somewhat resembles that adopted by Messrs. Metcalf and Company, of Sydney, but I am familiar with the Adelaide process known as the Marchant process. In the case of the buildings which it is proposed to erect at Seymour, the use of concrete would be a hopeless proposition. I understand that the stone would have to be brought from Melbourne. A very important matter in connexion with the projected works is to get a railway to the site before operations are started. However, I am afraid that that is hopeless. If it could be done a lot of money would be saved. Under existing conditions, we shall have to take delivery of all materials at the railway station and cart them out to the site. The railway connexion, I understand, will cost about £5,000. If the proposed works are approved, the railway should be laid down immediately. The equipment stores would cost 12½ per cent. more if erected in concrete than they would if constructed of brick, whilst the vehicle stores would cost 10 per cent. more. But the time occupied in construction would be about doubled. I think that the Defence Department proposes to include in its next year's programme of works the erection of two more vehicle stores.

37. *To Mr. Mathews.*—There is a loop-line leading into the buildings at Liverpool, but I do not think that it has yet been completed.

38. *To the Chairman.*—In all these store schemes the laying down of a railway is regarded as a necessity for the efficient handling of the stores. The proposed works at Seymour are quite big enough to warrant the construction of a railway. In time of mobilization it would be very important to get the stores away promptly to the points where they were required. Adverting to the question of brickwork, it must be pretty well known to the members of the Committee that during the past few months a very large proportion of the brick buildings in Melbourne have been held up for want of bricks.

39. *To Mr. Mathews.*—I do not know whether it is a fact that brick works are still being closed. I was told only the other day that there is rather a tendency to increase enterprise in connexion with brick works. But during the past twelve months it has been absolutely shocking to see the number of buildings in Melbourne standing idle for lack of bricks.

40. *To the Chairman.*—The "Kaustine" system of sewerage proposed to be adopted at the caretaker's cottage and for the staff generally is a new one. I have become very interested in it, but this is the first time I have had an opportunity of suggesting that it should be installed. At first I was rather sceptical as to its merits. The hobbler of the Australian patent rights came to see me about it, and I laughed at the idea. But I have since satisfied myself that by the adoption of this system all the advantages of life in a sewered area can be secured in the most remote parts of the country. I made inquiries into it and found that the excrement is deodorized by chemicals, principally caustic potash. Mr. Goss invited me out to see the installation at his works at Richmond. It had been in use for about four months, and it was quite odourless. It possesses all the conveniences of the ordinary water closet, but requires no flu-hing. Beneath the water closet there is a cylindrical drum and the excrement passes into a mixture of caustic potash, where it is deodorized. The method of ventilation is very clever. At the bottom of the tank there is a valve, and in some situations where there is a porous soil it would be quite possible to arrange for a loose rubble drain to connect with this valve and to lead to an absorbing pit. About every six months the liquid which had accumulated could thus be got rid of. Where that is not possible the tank would require to be pumped out twice a year and recharged. The cost per annum would be about 40s., which is very much less than the cost of maintenance of an ordinary earth closet. The cost of all materials connected with the system, ready to set up, either on

truck or steamer, in Melbourne, is £22 10s. Provision has been made for installing this system in the proposed buildings at Seymour. If members of the Committee feel sufficiently interested in it, they can view an installation of this system at the tea kiosk in the Melbourne Botanic Gardens.

(Taken at Melbourne.)

THURSDAY, 6TH MAY, 1920.

Present:

Mr. GREGORY, Chairman.

Senator Needham.	Mr. Mackay.
Senator Newland.	Mr. Mathews.
Mr. Atkinson.	Mr. Parker Moloney.
Mr. Bamford.	

Brigadier-General John Keatly Forsyth, C.M.G., Quartermaster-General, Department of Defence, sworn and examined.

41. *To the Chairman.*—The proposed stores are for the purpose of accommodating guns, vehicles, and other military equipment that belonged to the seven Australian Divisions that were engaged in the recent war. The Commonwealth Government arranged with the Imperial authorities to supply troops fully equipped. Although much of the material was supplied from Australia, it was not found possible to supply all the equipment, and in consequence the British Government provided certain equipment and debited the cost of same to the Commonwealth on the understanding that at the termination of hostilities the material should belong to Australia, the British authorities replacing all deficiencies and making good all damages so that the equipment, when handed over, should be either new or in serviceable order. That is the material for which storage accommodation is required. Some of it has already arrived in New South Wales. Stores for the purpose of housing it have been commenced at Liverpool; some of them have been completed, and others are in course of erection. They are of the same type as the proposed stores at Seymour; although the dimensions of the buildings differ, the aggregate floor space is about the same. The stores at Liverpool are satisfactory, although experience has suggested a few alterations which we propose to embody in the stores at Seymour. The question of establishing mobilization and vehicle stores in Victoria was considered by the Defence Department, and the Military Board, with the approval of the Minister, decided that Seymour was the most suitable locality for them. The suitability of the site has been fully investigated by the engineers of the Works Branch of the Defence Department, the officers of the Works and Railways Department advising only in regard to water supply. In addition to Seymour, the suitability of sites at Broadmeadows and Kilmore was investigated. Broadmeadows was rejected for several reasons, amongst them the boggy nature of the ground in wet weather, and the cost of providing an adequate water supply. Taking all things into consideration, including defence requirements, Seymour offers the best site. The other two are impracticable except by incurring great expenditure. The quality of the ground at Seymour is infinitely superior to that at the other two places; the camp site is very firm. In regard to railway facilities, Seymour is a much less expensive proposition than Kilmore would be. In order to utilize Broadmeadows we should be obliged to acquire more land, and to build about the same length of railway as is required at Seymour. The water supply at Broadmeadows would cost about £40,000, and at Kilmore between £40,000 and £50,000. At Seymour the water is actually laid on, and an expenditure of only about £4,650 would give us a supply sufficient for the largest number of troops that is likely to be there at any one time. From a military point of view, it is essential that a railway siding should run into the stores; in fact, I am of opinion that when the siding is being built into the stores, it should be carried further in order that it may be used for conveying troops, horses, and provisions right into the camp instead of unloading them at Seymour. The supplies of food and fodder required for two and a half divisions of troops amount to about 250 tons per day. The expenditure of £75,000 for which we are asking now is estimated to be sufficient to meet our requirements for stores at Seymour, but there is a question as to whether a magazine for artillery and small-arms ammunition should not be established there. It has almost been decided that a magazine should be be established there. The cost of the proposed magazines would be:—1 small-arm ammunition, £6,500; 1 artillery ammunition, £6,500; total, £13,000. The artillery practice ranges are at Seymour, and the ammunition should be there too. I cannot give any estimate of what further buildings would be required, but I know that we shall want about 20,000 square feet of space for small-arms ammunition, and a similar space for artillery ammunition. The urgency of providing these mobilization and vehicle stores is explained in this way: I have already said that this material was originally purchased by Australia, and it was known that storage for it would have to be provided by the time it was sent out to the Commonwealth. Originally, it was decided that the stores should be at Broadmeadows. Believing that this material was to be sent to Australia, and that the provision of storage accommodation was urgent, we erected a number of buildings at Liverpool, although not so many as I asked for and knew would be required. Later a question arose as to whether the material should come to Australia at all. I understand that the Board of Inquiry, of which Mr. McBeath was chairman, on going to England recommended that the material should not be sent to Australia, but should be sold abroad, and that, in the interests of Australia's industries, all our supplies should be made locally. Of course, it was impracticable to sell military equipment in England to advantage where the market was glutted with material of that kind. While this question remained undecided for months we could take no further steps for the erection of stores. Only a few months ago the Department finally decided that the material should come to Australia. Since then there has been no slackness or delay in taking all steps preliminary to the erection of the necessary stores. In the meantime, the Business Board had secured temporary stores at Spotswood for surplus uniforms and other material that is coming to hand, but those stores will not house a single waggon. We have been advised that the first shipment of material would leave England for Victoria at the end of April. It will be necessary to continue, in addition to the Seymour establishment, the Ordnance Stores at St. Kilda-road. The latter are unsatisfactory on account of the risk of fire, and I think that new ordnance stores ought to be erected. In regard to the preparation of plans for the stores at Seymour there has been the most complete collaboration between the Defence Department and the Department of Works and Railways. The matter has been discussed for months, and I am quite satisfied with the type of building that has been designed. The proposed buildings will house much valuable material which could not be replaced suddenly. We do not insure ordnance stores against the risk of fire. I am quite satisfied in regard to the precautions against damage by fire at Seymour. There would be a caretaker on the premises; the buildings will be of galvanized iron, and there will be a distance of 40 feet between the vehicle sheds, 132 feet between the large equipment stores, and 100 feet between the vehicle stores and the others, whilst a brick wall will subdivide each building. I consider a galvanized iron building quite safe; there will always be a certain amount of risk no matter what type of building we may erect. We have not considered the question of erecting a concrete building, largely because of the tremendous expense that would be involved; moreover, we are of opinion that military equipment is safe in no building against humans unless it is guarded by humans. If the material were in the strongest possible building, people who were antagonistic would do damage unless there were the caretakers on the spot to prevent them. I think the building as designed will be satisfactory in respect of protection against fire, deterioration of the contents, and theft. There is a fire brigade at Seymour and an ample water supply. The only living accommodation that is being provided is a caretaker's cottage. There will have to be other staff there at times, but extra accommodation can be obtained at Seymour, which is less than a mile distant. I have no fear of the deterioration of leather goods. The buildings will have good ventilation, and the saddlery will be well dubbed.

42. *To Mr. Bamford.*—There is no disadvantage in the difference between the floor levels of the various buildings. Of the seven buildings shown on the plan, it is proposed that the two at the eastern end should not be constructed now, but, in my opinion, they should be built in preference to the two stores on the western end, which will involve a good deal of building up of the ground. That will be objectionable from two points of view; firstly, that more expense will be involved, and, secondly, because the bricks laid on the ground will not give as substantial a platform for waggons. I think that it would be cheaper to build the two eastern sheds than to build the two on the western end. In connexion with the stores at Liverpool, I suggested that it might be better to lay the floor bricks on the edge instead of on the flat, but the Works Department assured me that bricks laid flat on sand would be as strong as bricks laid on the edge, and would be less expensive. I did not think so, but we have not had sufficient experience yet to test that policy. The floor in each of these buildings is estimated to cost £1,098. Of course, if the bricks were laid on the edge, the cost would be much greater.

43. *To Mr. Mathews.*—I think it desirable to surround the buildings with a good fence. It is proposed to erect 96 chains of four-wire fencing at an estimated cost of £600. The proposed railway siding is designed solely in connexion with storage requirements, but for the handling of troops and horses, and food for them. I would suggest that it should be continued right into the camp.

44. *To Senator Newland.*—In the stores will be all kinds of material, including clothing and tents. They will be handled in the same way as goods in the Ordnance Store, but they will not be checked and turned over so often, because they will not be used so much. In regard to deterioration from moths and silverfish, I understand that blankets and bedding, if properly packed away with the proper preventives, are immune from this danger, and that only an occasional inspection of an odd bale is required. I do not think that it is our system to store blankets and bedding with mobilization stores. Of course, the stores will have to be handled periodically; for instance, the wheels of the waggons must be turned at regular intervals, and we shall require to employ labour other than the caretaker. It is proposed to form an Ordnance Corps, which will be a military organization. Many of the men will be labourers, but they will belong to the Ordnance Department. At present, the Ordnance staff is a hybrid civilian and military affair. In regard to housing accommodation for the additional staff, the occasional handling of the goods would not be sufficient to necessitate a large staff residing at Seymour. The stores are not to be a receiving and issuing department. In order to overhaul the stores, men might be sent from Melbourne, and, if necessary, they could be lodged in Seymour for the time being. The only time when the stores would be likely to be disturbed to any great extent would be during camps of training. The stores might not be disturbed much even then; it would depend on whether or not we had a complete separate equipment for camps. Our aim would be that these stores, which are intended for war purposes only, should not be used for peace training. The preservation of stores which are distributed to scattered and partially trained civilian troops is more difficult than in the case of stores issued to a regular army, especially if the troops are allowed to take some of the equipment to their homes. Whatever staff was required at Seymour would be officers of the Department, and any temporary labour that might be employed at any time would be under the close supervision of a permanent man. The normal number of men likely to be employed at the Mobilization Stores and Magazines at Seymour is twelve. The heaviest article that is likely to be in the stores is a gun carriage weighing 16 cwt. The gun itself will not be on the carriage when in the stores. A field gun or howitzer weighs about 9 cwt. We have estimated the heaviest of the other equipment to weigh about 250 lbs. to the square foot when stored. Each gun-carriage wheel would probably rest on a couple of bricks. The bricks will be grouted. A concrete floor would be very much more expensive.

45. *To Mr. Mackay.*—The Department has little or no materials, such as second-hand timber or galvanized iron, that would be of any use for the erection of these stores. Any Defence Department buildings that were erected during the war in the various camps are being retained for training purposes. The bulk of the uniforms that are being sent to Australia from England were originally made in Australia. We did have some uniforms made in England. I cannot say what proportion of the uniforms that are being sent out are of Australian origin.

46. *To Mr. Parker Moloney.*—The Defence Department was solely responsible for the selection of Seymour as a site. The area of land the Department owns at Broadmeadows is 142 acres. At the time Broadmeadows was selected to be the concentration area, it was proposed to acquire an additional area of 339 acres, the cost at that time being £13,000—present cost, say, £15,000. The cost of land proposed to be acquired at Seymour is estimated at £1,500. This includes the additional land which I recommended to be obtained. The land owned by the Department at Broadmeadows at present would not be sufficient if that were to be made the principal Victorian camp. There are many objections to Broadmeadows. I have mentioned the cost of providing the water supply and additional land. There are also objections in the interests of the men themselves on account of its proximity to the city, and certain military objections which I cannot state. The maximum number of troops ever accommodated at Broadmeadows was 12,000. I understand that most of the material that is being sent from England is new; it will be absolutely serviceable and in good order. The Imperial authorities are treat-

ing us very well. Temporary storage is out of the question. We cannot get any storage accommodation in Melbourne, and this material could not be placed under tarpaulins. Having seen the buildings at Liverpool, I am satisfied that galvanized-iron structures are good enough for conservation purposes. Some of the galvanized iron in the buildings that were erected in the camps during the war has been disposed of, but most of them belonged to the Y.M.C.A. and the churches. There is no old iron available in Victoria which could be utilized in the new Mobilization Stores. Eight tons of new iron are available. Some 10 to 12 tons of old iron were disposed of, but this iron was not of sufficiently good quality for use on Mobilization Stores.

47. *To Senator Needham.*—The stores at Seymour are intended to house material for the district of Victoria only. The value of the material being sent out to the Commonwealth is approximately £7,000,000. Of this amount, approximately £2,500,000 represents the value of equipment issued to military units prior to embarkation from Australia, the balance (to value of £4,500,000) having been purchased from War Office stocks to complete the equipment of the Australian Divisions prior to their taking the field. The value of the material to be stored in Victoria is, approximately, £3,000,000. There is no intention at present of acquiring additional ground at Seymour for the storage of heavy armaments, but there is a possibility of the Commonwealth receiving some heavy guns from England. Over and above the normal equipment of divisions, all sorts of additional instruments of war were introduced during the recent struggle. For some of that material we have paid, just as we have paid for this equipment that is now being sent out. We do not know exactly what extra material we have paid for, but it must include many things that are not required in Australia. I believe that we have asked the British Government to supply us, in lieu of material which the Commonwealth has paid for but does not require in Australia, with heavy guns to a corresponding value. We have no knowledge yet of what, if anything, we are likely to get in that way. We shall probably have to cable to England to ascertain the exact date on which the first shipment of material, which was due to leave at the end of April, actually did leave. From cabled advice, it is expected that the first shipment of A.I.F. equipment will arrive about the middle of June, 1920. As I have already said, we have made temporary storage arrangements at Spotswood, but that is an unsatisfactory policy, because it involves the transfer of the material to the temporary store, and its subsequent removal. Although I have not given thought to this point before, I think it necessary to install automatic sprinklers in the equipment stores, but not in the vehicle stores, as an additional safeguard against fire.

48. *To Mr. Atkinson.*—Seymour will be the chief military camp in Victoria. The Defence Department owns 800 acres there. It is a little further from Melbourne by rail than Kilmore, and, of course, much further than Broadmeadows. That will mean extra railway charges when troops are being taken into camp. The fact that Seymour is to be the principal military centre in Victoria is a very good reason why these stores should be placed there, although mobilization stores, if we were fully equipped with ordinary camp requirements for use in time of peace, would not be utilized much in connexion with the regular training of the troops. Having regard to economy, military considerations, and everything else, I think it better that the stores should be built at Seymour rather than at Kilmore or Broadmeadows, although both those places are nearer to Melbourne.

49. *To Mr. Parker Moloney.*—No branch railway has been built into Broadmeadows camp, which, however is contiguous to the main line. If Broadmeadows were chosen as the site instead of Seymour, a branch line similar to that to be built at Seymour would be necessary. The existing old "Outer Circle" line would not answer our requirements.

50. *To Mr. Bamford.*—We do not anticipate receiving in Australia any other big gun of the calibre of that now at Sydney Railway Station; 60-pdr. guns and 8-in. howitzers are the biggest weapons that we anticipate getting amongst the heavy guns we have asked for in lieu of the material paid for but not required in Australia. It is the policy of the Department to establish mobilization and equipment stores at Brisbane, and branch stores at Townsville and Rockhampton; in fact, the stores at Enoggera Camp are now being erected by contract.

51. *To the Chairman.*—It is proposed to build the vehicle shed at Seymour with open sides. The vehicle sheds at Liverpool are closed in all round; as a matter of fact, the exit sides are practically a series of continuous doors. I think that in that design we made a mistake. That plan was adopted because of the old method of storing equipment in complete sets for each unit. The full mobilization equipment of each unit was assembled together in one division, and the idea was that a unit could be told, "You can get the whole of your equipment at such-and-such a door." I am satisfied that that arrangement is not good. In future, we shall store the whole supplies of one article in a particular place, but the articles can be arranged in sets for regiments, but not for any particular regiment. For the purpose of storage and overhaul it is better to have all the rifles together, all the web equipment together, and so forth. The design adopted at Liverpool has involved the placing of too many uprights in the centres of the floors. We have also used big folding doors, all of which run to the full height of 12 feet, with a consequence that they have already begun to sag on the hinges. The openings are 16 feet wide, and are covered by four doors comprised in two folds, two 4-ft. folding doors covering each half of the opening. In the sheds to be erected at Seymour there will be only one row of uprights in the centre, thus avoiding much of the obstruction that has been experienced at Liverpool. The departmental engineer was keen on having these sheds constructed with open sides, and said that it was not necessary to close them in, so long as the opening was on the lee side. I did not concur in that view, and I am stronger against it than ever. At a country place like Seymour also, there are bound to be a great many birds, and much of the material will be injured if the sheds are used by the birds for roosting. It may be said that it is sufficient to have an overhead covering, but vehicles can be damaged by rain, draughts and dust. Therefore, I suggest that the sides should be covered in, but that there should be only nine doors to the 300-ft. side; and, as there would be no centre posts, the doorways need be only 8 feet wide. Only three of them need be carried to the full height of 12 feet. The others need not be more than 8 feet high. I consulted Colonel Owen this morning, and he said that this alteration could be made for less than £1,000 for the whole five sheds. I have a fear that, if the sheds were open, boys, and even adults, might carry away small parts, such as swingle-bars. A certain amount of ventilation is necessary, of course, but sufficient can be obtained without having open sides. Another point is in regard to the size of the uprights under the equipment stores. At Liverpool, we used 4 x 4 posts, with an occasional 6 x 6 going right through, and set in cement; the 4 x 4 are set only in the ground, but I am told they are strutted. Recently I examined some 4 x 4 and 6 x 6 posts of the very best timber, which were put in the ground in Queensland not more than twenty years ago, and they are already rotten at the bottom. I question whether a 4 x 4 post is good enough for these stores. I ask the Committee to consider the advisability of using 6 x 6 posts all through. I read in the press that Mr. Murdoch said that these buildings would have a life of from 30 to 40 years. Would not a galvanized-iron building, in which good timber had been used, last 100 years? Recently I was in a building in Queensland built by my father 40 years ago, and it is still perfectly sound. Another point I suggest to the Committee is as to whether the Government should not acquire a little more land at Seymour in case it is required for magazines. I do not know what the regulations say as to the distance which magazines should be built from the equipment sheds, but small-arm ammunition is not very dangerous.

(Taken at Seymour.)

SATURDAY, 8TH MAY, 1920.

Present:

Mr. GREGORY, Chairman;

Senator Needham,	Mr. Mackay,
Senator Newland,	Mr. Mathews,
Mr. Atkinson,	Mr. Parker Moloney

James Charles Morton, Medical Practitioner, Seymour, sworn and examined.

52. *To the Chairman.*—I was a Lieutenant-Colonel in the Army Medical Corps of the Australian Military Forces, and had special duties to perform at the Seymour Camp. I was Senior Medical Officer at the camp in 1915 and 1916. I was Senior Medical Officer at Broadmeadows Camp in 1917, and in 1918 until the end of the war. For a short time—a period of two months—in 1917 I was at the Bendigo Camp. I consider the site of the Seymour Camp a very suitable one for the mobilization of troops. I prefer the Seymour Camp to the Broadmeadows Camp for this purpose. The nature of the ground and the terrain makes the Seymour Camp much more suitable. The ground at Seymour is hard gravel, and readily carries off water and sewage. At Broadmeadows the ground is soft black soil that holds water, and is cold under foot. I was in medical charge at the Seymour Camp in 1915, when there must have been nearly 20,000 men there. When I was at the Broadmeadows Camp there was less than a quarter of that number. I consider that the Seymour Camp could accommodate at least 15,000 men, whilst, in my opinion, Broadmeadows could not properly accommodate more than a quarter of that number on a similar area. It is possible to spread out the troops at the Seymour Camp, because as the hills and valleys are all dry the whole of the camp can be utilized. At Broadmeadows, only that portion of the camp that has been carefully prepared for the purpose by being gravelled and metalled to avoid the mud can be used. The Seymour Camp can be very easily drained. Broadmeadows Camp is on a plateau, and gets every breeze that blows. It is a bleak, cold place. I cannot give you the temperatures of the respective camps, but Seymour is a very much warmer place than Broadmeadows. We had no typhoid or fever at the Seymour Camp, but there were outbreaks of meningitis, measles, and influenza. For purposes of comparison, that is not a serious objection to the Seymour Camp, because when I was there we had a very big camp, with a large number of men, and the arrangements for their comfort were not so good as they were later. For instance, there were no floors to the tents. The men slept on the ground, and there were ten or eleven men in each tent. The number allotted to each of these bell tents was subsequently reduced to six. Later on, at Seymour, as well as at Broadmeadows, new tents were provided and floors were put in. I consider that the outbreak of meningitis was due to causes that are not likely to recur. It was due principally to the overcrowding of the tents. There was always plenty of good water at the Seymour Camp. We had no diarrhœa or similar diseases traceable to the water supply. There was no typhoid. No arrangements were made for filtering the water, but so far as I could tell it was uniformly good. Samples of the water were sent down to Head-Quarters for analysis, and the result was quite favorable. I do not know very much of the catchment area of the local water supply, but I believe that no animals are kept within the area, and there is nothing in it likely to deteriorate the quality of the water. As Health Officer of the Seymour Shire, the control of the watershed comes under my supervision. No occupation of the area that would be likely to deteriorate the water would be permitted. At Bendigo, I found the conditions of the camp fairly good. The water supply was good, and the site suitable for a temporary camp. I know the surroundings of Kilmore, and, if a camp were established there, I should say the conditions would be very similar to those at Seymour, because the country around could be easily drained. Taking into consideration the need for proximity to a railway system, I do not think you could improve on the Seymour site for a military camp.

53. *To Senator Newland.*—During the time I was in charge of the Seymour Camp we had some considerable falls of rain. We experienced very wet conditions occasionally, but they were not responsible for much inconvenience or damage, except in the early days, when the tents were overcrowded and men remained in them in wet clothing to keep out of the rain. In a very short time after heavy rain the ground was dry enough to walk upon without getting mud upon the boots. The only mud I saw in connexion with the camp was on the road. In my opinion, the outbreak of meningitis was due to the overcrowding of the men in the bell tents in the wet weather. The infection spread very rapidly. I joined the camp in July, 1915. It had then been in existence for six weeks or two months, and the outbreak of meningitis had just started with the first of the wet weather. When we removed certain men out of the infected lines of tents, and put them on new ground, with three or four, instead of ten or eleven men in each tent, no more cases of the disease occurred in the new lines. The outbreak was chiefly in one or two portions of the camp, but there were one or two small outbreaks in other parts of the camp. The earlier cases occurred in a part of the camp on fairly low ground, on the other side of the road from the present Head-Quarters. On my recommendation, those lines were struck, the men were evacuated and transferred to tents on a dry hill at the back of the camp. They were spread out with only three or four men in each tent, and no more cases then occurred amongst those men. Odd cases here and there throughout the camp occurred for some time afterwards. From the experience gained at Seymour and Broadmeadows, similar risks would never be taken again by the military authorities, apart from the advice of medical men. There will never be so much overcrowding of the tents, and floors will be provided in the future. I think that 15,000 men could be accommodated at the Seymour Camp, under safe hygienic conditions. There is some ground surrounding the camp on which it would not be safe to put men. Within 3

or 4 miles of the present camp, in different directions, there are sites which could be used safely for camps. We never had any complaints at the Seymour Camp of a shortage of water. There was plenty of water also at the Broadmeadows Camp. My objection to Broadmeadows is that it is a colder and a damper place than the Seymour Camp, and on that account is not healthy.

54. *To Mr. Mathews.*—I have had experience, as I have explained, in three different camps. I did not have experience abroad. I was engaged in home service all the time. The healthy condition of the area should be a primary consideration in the selection of any site for a military camp. Sites should be inspected by a medical officer before being occupied by troops. This was not done in every case, and, as a consequence, men were in some instances camped upon unhealthy ground. I was at Broadmeadows in 1917, when it was a much smaller camp than when first occupied. There was meningitis at the north side of the Seymour Camp, but it did not start there. I am aware that one part of the camp was called "Siberia." That was on the top of a hill, and was very healthy in the warm weather, but when the rain came the ground held the moisture. Another place, called "Kosciusko," was also on the top of a hill. The men were removed from those two places quite early, because of the wet, and because in those days there was no flooring to the tents. "Siberia" and "Kosciusko" were only small areas of about the size of the room in which the Committee are meeting. I was at the camp when sheds were substituted for the tents. I was back for a few months, in 1917, at Seymour when the sheds were erected. I think that the present site of the Seymour Camp is as good ground as could be selected anywhere for a camp. There might be outbreaks of disease in any camp if large bodies of men are crowded together. I think that Broadmeadows is a cold bleak place. It seemed to be always blowing very cold there. I would not say that there is anything deleterious in the soil, apart from the fact that it is cold for the feet. Apart from the cold and the dampness, I have no objection to Broadmeadows. If the Broadmeadows Camp could be improved in such a way as to obviate the mud, there would not be much objection to it. There is only a small area there of prepared ground that would not accommodate more than 3,000 or 4,000 men. Outside the prepared area you get the cold black soil conditions again. We had no notification of diseases while I was there. Seymour is much warmer than Broadmeadows, and, if mobilization were necessary in winter, Seymour would be the better place. The sheds are better for the men than tents, even though the men were not overcrowded in the tents. I think the outbreak of meningitis at Seymour was due to the overcrowding of unfloored tents, and might have occurred in any camp under similar conditions. The bell tents used were supposed to accommodate ten or twelve men, and the square tents to accommodate twelve men. The number was afterwards reduced to six for the bell tents and eight for the square tents. I think that the huts that were erected were built to accommodate 60 men in each. There was plenty of air space for each man. Each man would get, at least, 200 cubic feet of air space in the sheds now at the camp. We had no disease traceable to the water supply in either camp. I believe that an analysis had been made of the water supply at Broadmeadows before I went there.

55. *To the Chairman.*—The Kaustine system of treating sewage has not been brought under my notice. We had the septic-tank system at Broadmeadows, and it is satisfactory when properly attended to. I think that the septic-tank system should be introduced at Seymour. The system adopted here is a two-pan system, daylight service; it has proved quite efficient, but I prefer water sewerage.

Thomas Tehan, President of Seymour Shire Council, sworn and examined.

56. *To the Chairman.*—I am aware of the proposal to erect mobilization and vehicle stores here, and I know the site which has been selected for the buildings. I was not president of the shire when the Seymour Camp was occupied, but was a member of the shire council during the whole of the time the camp was established here. As a layman, I consider that the site selected for the camp is one of the most suitable that could be found. I know the site selected for the mobilization stores, and I consider it the most suitable site in the district within close proximity to the railway. I do not think the establishment of the stores at the site selected would be dangerous to the town. If sufficiently guarded the stores should be far enough away from the town to obviate any element of danger. I have been over the track proposed for a railway connecting the main line with the site selected for the stores, and consider the railway proposal a very favorable one. There are no difficulties in the way, and the line should be constructed at a very low cost. From my knowledge of the character of the country I say that there should be no difficulty in extending the railway from the site of the stores to the camp. To do so would effect a big saving in expenditure, as when mobilization took place there would be very heavy traffic from the stores to the camp. We have the same gauge for our tram lines as the railway, and we have our own engines, but occasionally we hire a Government engine while ours are under repair. We have 80-lb. rails and 45-lb. rails. We have taken the big locomotives of the Railway Department over the 45-lb. rails. The reason we have 45-lb. rails is because we have to pull up and relay the lines, and so use the lighter rails. Given the material on the ground it should be possible in a fortnight to construct the line from the railway to where the stores are to be erected. I think that if the Government had run a line out to the camp in the early days a saving of some thousands of pounds might have been made. The Water Trust Commission, of which I am chairman, controls the water supply of Seymour. By an arrangement with us the Defence Department obtained free all the water they required while the Seymour Camp was in existence. There is no agreement between the Defence Department and the Seymour Water Trust in connexion with the water supply for the future. We will be prepared to meet the Defence Department in a reasonable way in connexion with the supply of water in the future. On patriotic grounds we offered to supply the Seymour Camp during the war with all the water required free. We could not undertake to continue a similar concession under existing conditions. The Trust would be prepared to enter into any reasonable agreement to supply the Defence Department. We are at present supplying the Railway Department at a rate of 6d. per 1,000 gallons, and would be prepared to supply the Defence Department on similar conditions. I am aware that a water supply for the mobilization stores would be required not so much for drinking purposes, but as a security against fire, and I can give your Committee the assurance that there would be no difficulty in arranging for an adequate water supply for the proposed stores. The Defence Department has not, so far, proposed any agreement to the Water Trust for a water supply. We are considering the establishment of a plant for the generation of electricity. We could supply electric light to the stores if it were required. Whatever the requirement of the Defence Department in this respect might be we should be prepared to meet them reasonably, and put them on the same footing as any other consumer.

57. *To Senator Needham.*—For our electric plant we are arranging to have two engines of 65 horse-power

and one of 25 horse-power. The second engine of 65 horse-power is intended to provide for any case of breakdown in the night supply. The 25 horse-power engine it is expected will be sufficient to carry the day load. The scheme under consideration, if adopted, will enable us to meet local requirements, and to extend the use of electric light beyond the purposes at present under consideration.

58. *To Mr. Atkinson.*—I do not know of any site in the whole district or nearer to the present camp more suitable for the erection of the proposed stores than that which has been selected.

59. *To Mr. Mathews.*—I have said that if the material were at hand it would be possible to construct the connexion from the railway to the proposed stores in a fortnight. The cuttings would be very small, and including cuttings and necessary bridges or culverts, the work could be constructed in a fortnight if the material were on the ground. The road from Seymour to the camp is one of our main roads, but it is not a main road under the jurisdiction of the Country Roads Board. The council receives no special subsidy for the maintenance of that road. Before the camp was established at Seymour a very large amount of work was done on the road, but the Defence Department undertook to reconstruct and metal the road, and to maintain it during the occupation of the camp. We understood that the Defence Department was going to continue to maintain the road, but when we recently applied to the Department for a vote for its maintenance the reply was that they were not in a position to spend any money on it at the present time. The traffic on the road during the occupation of the camp was something enormous, and I think it was the duty of the Defence Department to maintain it. We have not spent any of the district rates on the maintenance of the road since the Defence Department took it over. Previous to that when it was used for local traffic we did spend money on it. If the railway were continued to the camp it would take practically the whole of the Defence Department's traffic off the road. I think that the traffic which would be due to the establishment of the camp at Seymour would be sufficient to warrant the extension of the railway to the camp. I base that opinion on the experience we gained during the time the camp was occupied. I think that the construction of a line to the camp would be justified even if it were only used for training purposes two or three times a year, because there are no difficulties in the way of railway construction on the route. The supply of electric current to the proposed stores would have to be regulated by meter established at the plant.

Egbert Lock, C.E., Engineer of Seymour Shire, sworn and examined.

60. *To the Chairman.*—I have not had much to do with buildings here, but the timbers we use chiefly are grey box, yellow box, redgum, ironbark, stringybark, and bluegum. Some of these timbers are more difficult to obtain than others. Almost any of the timbers mentioned would be useful for uprights, which have to be inserted in the ground. There is not very much good redgum now to be had in the district. The redgum on the banks of the river does not last as well as the redgum to be found on the hills. I have known redgum that has been in the ground for forty years to be still quite good. Any of the timbers I have mentioned would last from twenty to thirty years used as uprights inserted in the ground, with the exception, possibly, of yellow box, which I do not consider so good as the other timbers. It may be said that the life of redgum sleepers is about twenty years, but sleepers are taken out and replaced while they are still serviceable, and are often used for fences. A sleeper is often removed when nearly the whole of it is in good condition. You should get a life of thirty years from good redgum, and, say, a life of twenty years from the other timbers. A number of the bridges in the district have been in use for thirty years, and the timbers of most of them are still in fair condition. Timber for the proposed stores would be obtainable here, but the difficulty is that we have no local saw-mill, and it is possible that the demand for these timbers would not be sufficient to warrant the erection of a saw-mill plant. I think that the Department would have to get the timber required from outside this district. There have been no losses from white ants so far as I know in any part of the shire. I know the site of the Seymour camp. If open drains were required at the camp I think that to secure permanence they should be rough stone faced. There should be no trouble about installing the septic tank system at the Seymour Camp. The ground lends itself to drainage and sewerage. I have been here only about two years, but as a professional man I consider the site selected highly adaptable for the purpose proposed, because of the impervious nature of the soil, and the ease with which the site could be drained. After heavy rain the water runs away quickly, and it does not take long for the ground to dry.

61. *To Mr Atkinson.* I am doubtful whether uprights 28 feet long required for the proposed stores would be obtainable in this district. I take it that for the purpose of the mobilization stores it is necessary that the ground should be fairly level, and I do not know of any place near to the Seymour Camp that would be more suitable for the purpose than the one that has been selected.

62. *To Mr. Mathews.* The timber used in bridges in the district are not set in concrete. The bridges are supported by piles driven into the ground. If they were set in concrete they would practically last for ever, as they would be so well protected. If the uprights required for the proposed stores were set in concrete they would not decay so readily as if set in the ground, and should have a practically unlimited life.

63. *To Senator Newland.*—There is no saw-mill nearer to Seymour than the one at Yarck. Before I could say that the timber required for the stores could be obtained in the district, it would be necessary to ascertain whether any one would be prepared to take the risk of establishing a saw-mill here. There is plenty of timber in the district if it would pay to cut it for local requirements. Hardwood required for flooring purposes should last, at least, 30 years.

64. *To Mr. Atkinson.*—I think it would be found much cheaper to get the timber required from the nearest saw-mill and have it brought here by rail. The demand for timber here at present would not warrant the establishment of a saw-mill.

65. *To the Chairman.*—It has never been found necessary here to adopt any special method for preserving the life of timber placed in the ground.

66. *To Senator Needham.*—There is no chance of obtaining suitable bricks here for the proposed stores. If concrete were required, there is an unlimited quantity of gravel for concrete to be obtained here that is naturally graded, but we cannot get any cement at the present time. Any quantity of gravel in the proper proportions of sand and gravel for concrete can be obtained here.

67. *To the Chairman.*—I do not know that any large concrete works have been carried out here, but it is proposed to provide 28 soldiers' homes for the Housing Commissioner, and for this purpose gravel obtained from the river is to be used. It is unnecessary to put it through a crusher, as it can be used in its natural state. I have no connexion with this undertaking, but

I understand that the walls of the homes are to be built of concrete, in which the local gravel is to be used. If the cement were available, I should say that for the erection of a building with walls 300 feet long concrete would be the cheapest material to use, and the most lasting. I have carried out works in concrete, but not extensively. In erecting a cottage with concrete, I should simply box up the walls. It would be necessary only to have the boarding close, as the concrete would keep in shape, and the boards could be removed in about three weeks. If a wall of 300 feet had to be erected, the continuous process would be best, but I do not consider that it would be absolutely necessary. There would be no danger in interrupting the work if the concrete were kept damp and the surface irregular. I believe that gravel for concrete could be landed at the proposed site of the mobilization stores at a cost of 2s. 9d. per yard.

James Chittick, a member of the Seymour Shire Council, and of the Seymour Water Trust, sworn and examined.

68. *To the Chairman.*—I have heard the evidence of the chairman of the Water Trust, and confirm his statement as to the way in which water is supplied to Seymour. I have been associated with the water supply here for the last 25 years. Up till 1916, it consisted of a gravitation scheme from Trawool Creek by a 7-in. main. There is a reservoir at the top of the mountain built of granite and cement. Speaking from memory, it has a capacity, when full, of 18,000,000 gallons. The water runs down from Full's Creek to a pipe head weir. Then there is a small pipe-head feeding the 7-in. main, which is continued to Wallis Hill. At this place we have a service tank with a capacity of 700,000 or 750,000 gallons. That system supplied the requirements of the district up to 1915. In 1915, owing to the large consumption, due to the establishment of the camp at Seymour, it was found necessary at times to cut off the water for an hour or two on the hottest days. There was no restriction upon the use of the water in any way. No meters were used, and the people were allowed to use as much of the water as they pleased for stock, for domestic purposes, and for flower and vegetable gardens. We used a considerable quantity of water also in washing the drains of the street. In 1915, it was decided to put in a supplementary plant. That decision was arrived at in preference to a proposal to establish additional reservoirs on the mountain, and put in an extra main. The principal trouble was that the existing main was found not to be sufficiently large for the supply required. Because of the greater cost of additional reservoirs and an additional main, it was decided to provide for a supplementary supply by the establishment of a pumping plant at a point on the river 56 chains from the service tank. The reason this supplementary supply was provided for was to obviate the danger of a breakdown in the long line of pipes from the mountain reservoir, which is 9 or 10 miles long. I can confirm the statement of the chairman of the Water Trust that the arrangement made with the Defence Department was to supply the Department, during the term of the war, with all the water they required for the Seymour camp free of charge. The pumping plant for the supplementary supply consists of a Blackstone crude oil-engine of 63 horse-power. The main to the plant is 12-in. cast iron, and we have two plunger pumps capable of lifting 30,000 gallons of water per hour. We were told by the engineer who put the plant in that, by increasing the size of the pumps and the size of the suction pipe, at an additional cost of something like £300, it would be possible with the plant to lift from 50,000 to 60,000 gallons of water per hour. The engine we have is sufficiently powerful for that purpose. During 1915, the needs of the Railway Department were supplied to the extent of 71,120,000 gallons of water, and, in addition, we supplied all the requirements of the Seymour camp and of the town of Seymour. The Railway Department was charged 6d. per 1,000 gallons. A contract was entered into with the Department 25 years ago to supply 28,000,000 gallons for a lump sum of £750, and this works out at a rate of about 6d. per 1,000 gallons. This was continued until, in 1915, the requirements of the Railway Department reached the maximum of 71,120,000 gallons. The average consumption of the Railway Department for which the Water Trust must provide will be from 55,000,000 to 60,000,000 gallons per annum. The watershed of the mountain reservoir is virgin country used only for the grazing of sheep. A small area ½ mile long and 200 yards wide forms the reservoir, and is enclosed with a wire-netting fence. The Water Trust has power to prevent any contamination of the watershed, but it has never been found necessary to exercise that power. With our supplementary plant we consider that a failure of the supply is not possible. Approximately, the supply from Trawool with the 7-in. main is 131,000,000 gallons per year, or about 15,000 gallons per hour. We have a pumping plant now capable of lifting 30,000 gallons per hour—when tested it went up to as high as 32,000 gallons per hour—which will give, approximately, a supply of 262,000,000 gallons a year. The supply from the pumping station could be doubled, if necessary, by putting in larger pumps. It is proposed to establish an electric lighting plant for Seymour. The proposition will be finalized at the meeting of the Shire Council on Monday next. We have been assured by Mr. Christie, of Christie and Gardiner, electrical engineers, that the plant proposed will be ample to provide all the current required, and, if necessary, by high-tension lines, we can supply Tallarook, which is 5¾ miles by rail from Seymour, and other adjacent towns. The system proposed is a three-phase alternating current system. It is estimated that the main line of current, with 34 poles to the mile, and wire, can be erected at under £300 per mile. I was in Seymour during the whole of the time the camp was occupied. I believe that the only serious disease at the camp was an outbreak of meningitis. The camp was established in May, and shortly after it was occupied by 18,000 or 19,000 men. There were then many in the camp when the meningitis broke out. The men had, at the time, to sleep on the ground, with 2 or 3 inches of mud mixed up with the ironstone the conditions were not very healthy during the wet weather. The country is fairly level from Seymour to the camp, but I think that the best site has been selected for the proposed building. After the road is crossed, about ¼ mile from the proposed site, the ground is more subject to wet. There is a site available near the old isolation camp that is fairly level, but it is not as level as that which has been selected.

69. *To Senator Needham.*—It is proposed to generate electricity with three suction-gas engines—two of 65 horse-power and one of 25 horse-power. Mr. Christie informs us that 90 horse-power (65 + 25) will be ample for our purposes, and we shall always have one of the 65 horse-power engines in reserve. He would not recommend the use of water power.

70. *To Mr. Atkinson.*—The piece of level ground to which I have referred—near the isolation camp—is immediately to the north of the camp, and nearer to the camp than the site which has been selected for the store. There have been no negotiations between the Seymour Water Trust and any Commonwealth Department for the supply of water, but I should like to confirm what the chairman of the Water Trust has said, and say that we are quite prepared to treat with any Department for the supply of water on liberal terms. We would be prepared to treat any Commonwealth Department as well as we treat the Victorian Railway Department.

71. *To Mr. Mathews.*—The capacity of the Falls Creek reservoir is 18,000,000 gallons. It has been full for many months, but the last monthly report showed that it is 6 feet under the pipe-head. This is due to the fact that we are allowing a large quantity of water to escape into the river. If necessary, we could close the valve used for this purpose, reduce the water running down the stream, and immediately fill the reservoir. The source of supply is a perennial stream 3 or 4 feet wide and 2 or 3 feet deep, which runs like a race through the hills. The supplementary supply was put in, not because it was thought that the main source of supply would run dry, but to make provision for an emergency demand. In the summer season, while the camp was held at Seymour, and when the Railway Department required an exceptionally large supply, the 7-in. main was not sufficient to keep the service reservoir full, and, in order not to disappoint the Railway Department, we cut off the water for a few hours on five or six days in the week. Since we have put in the pumping plant, we have never cut the water off for an hour.

72. *To Senator Newland.*—I am fairly familiar with the value of land in the neighbourhood. As a trustee of the estate of the late James Copeland, in conjunction with a co-trustee, I sold half the block on which it is proposed to erect the mobilization and vehicle stores, representing an area of 24 acres 3 roods 35 perches, at £14 per acre. I have the contract of sale with me if any member of the Committee should care to examine it. For grazing purposes merely the land is not worth so much, but any land that can be used as this can—as an accommodation paddock in the vicinity of the town—is fairly worth about £15 per acre. This land has not been cultivated for the last 30 years, to my knowledge, and I suppose that it was not cultivated more than two or three times in the last 40 years. I find, on reference to the shire rate book, that the portion of the proposed site which I sold is rated on a capital value of £260, which represents, roughly, £10 per acre.

(Taken at Seymour.)

MONDAY, 10TH MAY, 1920.

Present:

Mr. GREGORY, Chairman;

Senator Needham,	Mr. Mackay,
Senator Newland,	Mr. Mathews,
Mr. Atkinson,	Mr. Parker Moloney.

Richard Fennelly, Civil Engineer and Mining Surveyor, sworn and examined.

73. *To the Chairman.*—I laid out the water supply for Seymour. The main came in through 7 miles and 11 chains from Trawool, and discharged 276,500 gallons in 24 hours into a service basin. That was found insufficient, and it was afterwards found possible to increase the discharge into the service reservoir to 360,000 gallons in the 24 hours. The levels at the upper end were then raised, and that gave an additional supply of 71,000 gallons, making a total discharge into the service reservoir of 431,000 gallons in the 24 hours. There is a very fine catchment area of about 6¼ square miles, or about 4,000 acres. It has been accurately surveyed, and owing to its spongy character makes an exceptionally good retaining ground. It is not possible to extend its area. I estimate that the rainfall of the area is about 24 inches in the year, and about two-thirds or 16 inches of that can be made available for the water supply. The present reservoir has a capacity of 16,500,000 gallons. The source of supply is continuous. If there were 100,000 men to be supplied in the Seymour camp for a month, in addition to the ordinary requirements which have to be met, that would make a very big demand upon the supply, and the pumping machinery should be brought into action at the same time. A great deal would depend on the season of the year when the demand was made. Through the summer time the demands of the Railway Department and the requirements of the town strain the capacity of the supply to the utmost. Such an emergency demand as you suggest would make a very severe strain upon it. The pumping service, however, is capable of great expansion because, of course, it has the Goulburn River to work on. The water got from the hills when stored up for a number of months appears to go a little bad. It does not keep as pure a stream as could be desired. The reservoir is always filled, and I have no doubt that it could be filled six times over in the course of the year. When the scheme was formulated thirty years ago we had a very dry season, but we got a satisfactory supply then. So far as I am aware the reservoir has never run dry, though of course it has been very low at different times. The pumping scheme for the supplementary supply was adopted because the alternative was to construct a second reservoir in the hills for storage, and to put in a second line of pipes. The pumping scheme was then taken into consideration, and it was considered by the Water Trust that that would be more economical, and that there would be no trouble about the water since it could be obtained from the Goulburn river at all seasons of the year. All along the course of the Goulburn river at Shepparton and a number of towns along the river the water is used, and I never heard any complaints of its quality. In the same catchment area, and along the same creek several reservoirs could be constructed, but I do not think you could conserve the whole of the available rainfall, as that would run into too much money. It would be possible easily to double the capacity of the present reservoir. I should prefer the water from the mountains to the Goulburn water, but the pumping plant is established now, and water from the Goulburn river is always available, and it is of fair average quality. We have never been able to tell the cause of the deterioration of the water stored in the reservoir, but I think it was due to weeds being allowed to grow around the edges. A similar difficulty occurred in connexion with the Yan Yean reservoir at one time. I have not heard complaints of the quality of the water lately. I could not say what steps were taken to overcome the difficulty at the Yan Yean reservoir, but I know that the opinion of several analytical chemists was obtained about it, and the objectionable quality of the water finally disappeared, and probably the same thing will occur here. The main from the falls reservoir is a 7-inch main. Before I took over the pumping scheme a very satisfactory trial of the plant was made. It was supposed to pump 30,000 gallons per hour. It was very carefully tested, and found to

be well up to the mark. With the two schemes in operation there is no possible doubt that a sufficient water supply could be provided for all the requirements of the town, and for 100,000 men if necessary at the Seymour camp. Allowing for an 8-hours shift the pump would provide a supply of 240,000 gallons, and this with the supply from the main reservoir of 431,000 gallons would give a total supply of 670,000 gallons in the 24 hours. Of course, if necessary the pump could be worked two shifts in the 24 hours, but I should not like to work it for three shifts. There should be no trouble in getting a supply of over 500,000 gallons in the 24 hours with an 8-hours shift for the pump, and the gravitation scheme. The pumping scheme as I have already said is capable of very great expansion.

74. *To Senator Newland.*—A shortage of water has been reported through the pipes not being big enough to carry the supply required when an extraordinary demand was made for the camp and the town. I am not aware that there has ever been any shortage due to a failure of the storage scheme. There are some meters put in, but they are evidently not sufficient in number. In my opinion there should be more of them, and some check put upon the supply to the town. If meters were used, the supply could be checked, and, if necessary, restricted. According to the newspaper reports I should say that the Seymour water supply is used by some people as an irrigation supply instead of a domestic and ordinary water supply. That kind of thing should be put a stop to. I have had to deal with others schemes, and amongst others with the supply for Kilmore. The water there was used indiscriminately for garden plots, and to grow maize and other green fodder for stock, and that had to be put a stop to. If we had larger pipes here there would be a bigger consumption of water, and a second storage reservoir would be required in addition to the 16,000,000 gallon reservoir. After the pumping scheme was decided upon the extension of the gravitation scheme was abandoned. If a second reservoir had been constructed both would have been fed by the same stream, but one would have been about a 1 mile above the other. I have not the slightest doubt that both reservoirs could be filled every year, perhaps four times, or more often.

75. *To Mr. Mathews.*—The deterioration of the water to which I have referred is merely that it gets a bad taste. I never heard that it was in any way injurious. So far as I know no attempt has been made to destroy the algae in the reservoir. The caretaker used some chemical with which to treat the water, and that always appeared to put it right. I am not aware that the Water Trust has ever sought the opinion of medical men or scientists to discover the cause of the trouble and correct it, but if the complaints of the quality of the water were serious something would of course have to be done in the matter. It would not be safe to increase the capacity of the present service reservoir by making the walls higher, because the foundation at one end is scarcely to be depended upon. If the water were raised to a higher level and the head of water increased it might be liable to spring leaks, and it would be better in my opinion to build a new reservoir than to try to increase the capacity of the existing reservoir in the way suggested. I could not say what expense would be involved in the building of a new reservoir, as that would depend on the site selected and the configuration of the ground. The site originally selected for the second reservoir that was proposed was a favorable one, but the members of the Water Trust altered their minds in favour of the pumping scheme. We never went so far in connexion with the construction of the second reservoir as to put down bores or shafts, and no engineer would estimate the cost of a reservoir without knowing what the foundations would be like.

76. *To Mr. Mackay.*—The only place between this and Melbourne at which the Railway Department could get another supply would be at Wallan. The supply here is pretty heavily tested during the summer time. I heard of no complaints from the residents of the town of a shortage of water during the time the camp was in full swing. So far as I know, no restrictions upon the use of the supply were imposed, and since the pumping plant was established the supply provided seems to meet all requirements.

77. *To Mr. Parker Moloney.*—The expansion of the pumping scheme to increase the water supply could be much more expeditiously effected than the construction of a second reservoir in the hills. The pumping scheme could be extended very quickly, but it would take a considerable time to construct a second reservoir through the hills and lay the necessary pipes. At the time that the Trust proposed to lay down a second line of mains and construct a second reservoir, the cost of pipes was nothing as compared with the present cost. When the scheme to which I refer was formulated, the pipes cost £9 or £10 per ton, but they would cost £15 per ton at the present time. If an immediate increase in the supply were required, the pumping scheme could be easily and quickly expanded, as the site is laid out, the levels have been taken, the pipe track is run out, and it would be merely a question of getting more powerful machinery. If that were done, all requirements of the camp could be met, because the Goulburn River is a most reliable supply. It is a little difficult to say whether a pumping scheme or a gravitation scheme would be the more expensive. In the case of a gravitation scheme you have to take into account the cost of the reservoir and mains, and must provide for interest and sinking fund on the cost of construction. In the case of a pumping scheme, whilst the initial cost may be less than in the case of a gravitation scheme, the working expenses for fuel and labour may run into a good deal of money. The comparative cost of the two schemes would have to be carefully considered, and then the most economical could be selected. But there is no doubt at all that with the pumping scheme the supply from the Goulburn River would never run short. I have never heard of any epidemic traceable to the deterioration of the water to which I have referred.

78. *To Mr. Atkinson.*—I have not heard of the weeds at the reservoir causing any trouble during the last two or three years. There is a head of 459 feet at the reservoir. That is the difference between the levels of the pipe-head and the railway station. I have not heard any complaint of the water, except as to its taste. When it has been complained of, it has only been that it is not palatable. I have heard of no ill-effects from the use of it. A similar difficulty has occurred under similar conditions at Euroa, where they have a large reservoir in granite country, the same as this.

79. *To Mr. Mackay.*—I understand that the objectionable taste in the water was noticeable for two or three years. The caretaker at the reservoir would probably have kept records on the subject.

80. *To the Chairman.*—I know the site which has been selected for the proposed stores, and have known it for the last 30 years. It is good solid ground. I have been roadmaking alongside of it. I excavated trenches there, and had an opportunity of seeing the subsoil, as well as the surface soil. I think it is an excellent place for the proposed buildings. I do not think that it would be likely to become very boggy in

wet weather. I doubt whether you could get a better place anywhere. There is Whitehead's Creek on the north side of the site, which makes it excellent for drainage. I have not done any big work in concrete about here, but have heard of one or two buildings being carried out in concrete. This is one of the most favorable parts of Victoria in which to carry out concrete work. The best supplies of gravel can be obtained from the Goulburn River. It has been used for building bridges, and has been taken from here by the Railway Department for the purpose for places down the line. Its advantages are, first and foremost, that it is perfectly clean river-washed, and there is in it sufficient sand and fine stuff to fill in the crevices between the aggregates. It would not be possible to get the same class of gravel in Melbourne for less than from 10s. to 12s. per cubic yard, but it could be landed here at the railway station yard for about 2s. 6d. per yard. When I was engineer of the shire, I got it delivered on the streets for 2s. 6d. per cubic yard. If required for the construction of the proposed stores, the gravel could be got from the river at a place to the east of the railway station, and nearer the proposed site. Gravel taken direct from the river has a great advantage in being so perfectly clean. With gravel taken from the pits there is a lot of work involved in washing it. It has been tested for culverts by the Country Roads Board, and seems to have given satisfactory results. It was used in the construction of the viaduct here in 1872, and there is a block of it there now which nothing but a charge of dynamite or gelignite could break up. This gravel is available all through the summer, and there are hundreds of thousands of cubic yards of it.

81. *To Mr. Mackay.*—So far as the deterioration of the water is concerned, the only thing against it is the bad taste. I never heard of any complaint that it had been injurious to health. There was just a disagreeable taste in it, and, in my opinion, that was caused by the growth of weeds in the reservoir. There is a large enclosure fenced in, and weeds and rubbbish were allowed to grow there. If that had been burnt off, there would have been no more trouble. I have never known the reservoir to be cleaned out, but what is required is that the growth of rank weeds around the edges should be removed.

Cecil Edward Christie, consulting electrical engineer, sworn and examined.

82. *To the Chairman.*—I am in consultation with the Shire Council of Seymour in regard to the erection of an electric lighting plant. It is proposed to establish a plant of suction-gas engines—two of 65 horse-power and one of 25 horse-power. What is proposed is an alterating current scheme of 400 volts 230 three-phase, providing a continuous supply. It is proposed to run the big engines to carry the heaviest load at night, and to use the smaller engine for the lighter load required during the day. It is proposed to extend the main about a mile on either side, and the scheme is capable of expansion. It will be suitable for the supply of current for power, as well as for lighting. Everything will depend on the amount of consumption, but I feel satisfied that the Shire Council will be prepared to supply the current at 8d. per unit, with a sliding scale, according to consumption, down to 6d. per unit. There would be no difficulty in running the supply out to the Seymour camp, as it would be possible always to transform up to any voltage required, and step down again. If the three engines were run at the same time, they would supply any quantity of current that might be needed for the camp as well as for the town. If a large supply were required at the camp, I do not think there would be any difficulty in providing for it. I understand that the Railway Department is prepared to take the complete supply from the shire council.

83. *To Mr. Mathews.*—I could not see any particular advantage in proposing a hydro-electric supply for Seymour. I considered it advisable to go in for a suction-gas plant until such time as the Morwell scheme is developed, and current can be received from that scheme.

84. *To the Chairman.*—I estimate that the cost of the mains would be about £300 per mile. Providing you stepped up to a sufficiently high voltage, the loss of current on 3 miles of wire should not be more than from 2½ per cent. to 5 per cent. If the main were extended for a mile to the site of the proposed stores, and the voltage generated for the town were continued, the loss might be 10 per cent. To run the current out to the stores it would be hardly worth while to step up to a higher voltage. With respect to the wire to be used for effecting an extension to the proposed stores, everything would depend on the tension. For a high tension I should say that seven fourteens-copper would be sufficient, that is to say, seven strands of 14 gauge copper wire. If the current were extended to the Seymour camp, the loss in transforming on the step-up and step-down would be 12 per cent. on each side, or probably a loss of 25 per cent. Whether that loss would be an extra charge on the cost of lighting would be a matter for arrangement, but in all probability it could be met by a charge of 7d. per unit for supply to the camp, as compared with a rate of 10d. per unit in the town, which would be a fairly low price.

85. *To Mr. Mathews.*—I understand that the demand for current at the camp would be likely to be made only at intervals. That would not affect the town supply, as there is provision made for a stand-by engine in the power-house. That could be used for the supply of the camp if it were needed.

Thomas Tehan, President of Seymour Shire Council, recalled and further examined.

86. *To the Chairman.*—The water in the mountain reservoir got very low down in the dry season of 1914 and 1915. A certain growth of weeds occurred, and when the reservoir filled that vegetable matter decayed, and deteriorated the water to a small extent. By deterioration I refer only to the bad taste of the water. It was treated satisfactorily with sulphate of copper.

James Chittick, member of Seymour Shire Council and Seymour Water Trust, recalled and further examined.

87. *To the Chairman.*—The water supply has been perfectly pure throughout, but when the supply in the reservoir fell a lot of pennyroyal, a very strong smelling weed, grew along the edges of the reservoir, and when it became submerged, as the reservoir filled, this vegetable matter decayed, and caused the taste of the water to become a little objectionable for a time. During the last four or five years the reservoir has been kept full continuously, and there has been no objection to the taste of the water, which is as pure as any that can be obtained in this State. We have had no analysis of the water for some years. We could get an analysis of it for the Committee, if desired.

(Taken at Melbourne.)

TUESDAY, 11TH MAY, 1920.

Present:

Mr. GREGORY, Chairman;

Senator Needham,	Mr. Mackay,
Senator Newland,	Mr. Mathews,
Mr. Atkinson,	Mr. Parker Moloney.
Mr. Bamford,	

Thomas Hill, Engineer, Department of Works and Railways, sworn and examined.

88. *To the Chairman.* I have been associated with the proposed buildings and stores at Seymour, and the matters with which I specially deal are the water supply, roads, surface drainage, and railway construction. I regard the site a very sound one, with easy access. The surface drainage and the railway access are good. It is more than fairly level country—it is level country—and this lends itself to the most economical building construction. There is area sufficient for the increased accommodation at present proposed, and adjacent, to the east, there is land that can be acquired for extensions, and is just as suitable. The area proposed to be acquired is 47 acres, and I understand that further areas to the east and the west—31 acres to the east, and about 19 acres to the west—can be also acquired. I understand that there is under consideration land for a mustering ground and small arms ammunition depôts. Estimates are being furnished to the Defence Department for further stores on this site. I do not know what the further stores are, but I think they are for two more vehicle sheds and one store. In regard to this I am speaking from memory. It is understood that the ultimate layout is as shown on the plan submitted to you; that is the locality plan of 2 chains to the inch for provision for two extra vehicle stores and three extra stores, and, in addition, small arms ammunition depôts. These depôts are not shown on the locality plan. I understand there is a desire to keep these ammunition depôts 200 yards apart, but I do not know the rules in that regard in Victoria. I think that under war conditions these rules have been very much modified. No actual suggestion has been made to the Department in regard to building mounds around them. I consider that a railway approach to these places is essential. This would not be a costly project, the estimated cost being something like £8,500; no heavy works are involved. In view of the difficulties in the Seymour yards, and the obtaining of material and sleepers, I think the work will take about two months; and that is not long considering the present conditions in regard to the cost of material and labour. There is a great shortage of material. The railway is the first work I would carry out, because a railway would save cartage of building material. I suppose that the convenience as compared with loading, unloading, and reloading, would represent over £1,000. The idea is to get the railway as quickly as possible, and the Victorian Railways Department has kindly undertaken to give all the help in its power in this direction I would use second-hand 60-lb. rails, but there are no second-hand sleepers available, and we require 4,000 or 5,000. The fencing of the site would be of a very simple character, consisting of four barbed wires, ordinary posts and droppers. I understand there is to be a caretaker appointed. In that district that fence would be sufficient with a caretaker. Any other fence would involve a larger expenditure, and I do not know that it would give much greater protection in view of the large area involved. There would be a mile of boundary and fence to watch. The water supply for fire purposes is ample; it is not quantity that is wanted, but head. We could obtain a good pressure from the Wallis Hill reservoir, a distance of, approximately, 8,000 feet. The idea is to lay a 6-inch pipe from the site, and provide hydrants with 4-inch pipes from the 6-inch pipes, two hydrants between each vehicle shed, and a hydrant to each of the store sheds. Each hydrant will be fitted with 100 feet of canvas hose ready for immediate use. I would not have any hydrants inside the stores. I consulted Mr. Lee, the chief officer of the fire brigade, and he does not think that necessary, but prefers to have the hydrants where they are shown on the plan, in the centre of the roadway between each of the buildings. I do not think it is usual to have hydrants inside as well as out in the case of large single-storied stores like those. In the Leichhardt stores, which are four stories, there are internal hydrants, but in a single storied building, in case of fire, it might be difficult to get at the internal hydrants. The hydrants are so located that a fire can be got at quickly from the outside, and I think there are twenty-six altogether shown on the plan. The supply of water comes from the service reservoir to the town of Seymour. We would have a separate main, and I cannot imagine any failure of the supply, which will be quite independent of the draw off for Seymour or any other purpose. The supply into the Wallis reservoir is from the service reservoir at Falls Creek. At certain times, I understand, the people of Seymour draw their water through the day from the Falls Creek reservoir, and through the night the surplus water fills the Wallis Hill reservoir. I think there is a good guarantee that the reservoir will always be filled. There is another added value in the fact that any pumping that is necessary from time to time to amplify the supply to Seymour must be done through the service reservoir, so we have it in both directions, either by pumping or gravitation. The supply of water is also ample, or could be made so, for the Government mobilization scheme and for training camp. That matter was gone into, not only in connexion with the site at Seymour, but also in connexion with sites at Kilmore and Broadmeadows; and reports were prepared for the Director-General of Works, and forwarded to the Defence Department, dealing with the three sites. The condition to be observed in each case was a supply of 200,000 gallons per day for six months in every year—that is for the ordinary citizen training—or, alternatively, a possible supply of 700,000 gallons a day for a period of twelve months for the concentration camp. Of the three sites Seymour is easily the best in regard to water supply. For a sum of £8,000 over and above the present stores expenditure of £4,650, a supply of 200,000 gallons a day can be provided, the total cost being £12,650. For the 700,000 gallons per day supply I add another £7,000, making a total of £19,650—that is for 700,000 gallons per day, for fire service for the stores and for the camp area. For the 200,000-gallon supply, at a site within the camp site, about the 700 feet level, as shown to the Committee recently, I put a 600,000-gallon service reservoir at an estimated cost of £4,000. I would run a branch pipe from the existing 7-inch main, from Falls Creek to the Wallis Hill reservoir, to this suggested service reservoir. That would cost £1,500. I would then reticulate the camp site at a further cost of £2,500, making £8,000 for the 200,000-gallon supply. For the 700,000 gallon supply I would have additional storage on Falls Creek for some 15,000,000 or 20,000,000 gallons, and this I estimate could be done for about £5,000. I would duplicate the pumping engine at the pumping station on the Goulburn, which could be done at a cost of £2,000. The present rising main of 12 inches would be ample. With this there would be a supply of 700,000 gallons per day, and, as a fall back, there would always be the Goulburn with its unfailing supply.

May I mention the alternative figures regarding the other sites, and to that end show the Committee a locality plan of the Melbourne water supply in relation, first, to Broadmeadows? From the plan it will be seen that the Yan Yean reservoir is at a level of 602 feet; the South Morang pipe-head reservoir is at 485 feet; the Preston reservoir at 326 feet, and the camp site is 400 feet. The present supply to the camp is from a 32-inch main that runs from the South Morang pipe-head reservoir to the Preston reservoir, from which a 6-inch pipe is taken at a point 4 miles due east of the camp, reducing to a 4-inch pipe to the camp. During the summer months that pipe from South Morang is discharging to its full capacity to keep up the draw-off, and the result is that there is practically no head in that main; but during the war the Board of Works was good enough to regulate the draw off, and they maintained the supply in camp, but with great difficulty. As soon as the war was over, the following letter was sent by the Board of Works to the Defence Department:—

(Works and Railways, V.1542/19.)
(Defence, B.646/2/37.)

Melbourne and Metropolitan Board of Works,
110 Spencer-street,
Melbourne, 23rd May, 1919.

19/3340.

SIR,

I am directed by the Water Supply Committee to invite your attention to the fact that the water supply to the Broadmeadows Military Camp was laid on during the war as a temporary provision for war purposes. The situation of the camp is high, and the pressure at times has been maintained only with difficulty. The Board cannot afford to maintain pressure on the large main, from which the camp supply is taken, to the detriment of the supply to other districts.

I am to therefore state that, in view of the termination of the war, the Board is not prepared to continue to supply water to the camp unless a new main from the reservoir at South Morang is laid free of expense to the Board.

Yours obediently,
GEO. A. GIBBS,
Secretary.

The Secretary for Defence, Victoria Barracks, Melbourne.

The level at South Morang is only 485 feet, and the camp site at Broadmeadows would be 400 feet, parts of it up to 450 feet. South Morang is 7 miles away from the suggested site at Broadmeadows, whereas the Yan Yean reservoir is only a further 4 miles, and has a level of 602 feet. To give an adequate supply to the camp it would be necessary to take from Yan Yean, for the 700,000-gallon supply, a 12-in. main for a distance of 11 miles, and for this reinforced concrete would be most suitable and economical, at a cost of £40,000. To this must be added a small storage reservoir with a three-days' supply in case of the failure of the main, and this would mean a further £3,000, or a total of £43,000. For the 200,000-gallon supply there would be a 7-in. main, and the cost would be £24,500, including the reservoir. The plan shows the position of the town of Kilmore, on the main line from Sydney to Melbourne, and also shows the Hazel and Bruce's creeks, from which the present water supply is obtained for the town. The suggested site of the camp is some 2 miles to the south of Kilmore. The Hazel Creek has a catchment area of about 1,200 acres, and Bruce's Creek a catchment area of about 600 acres. A 5-in. main is laid to Kilmore, a distance of about 14 miles. This 5-in. main, for the first three miles from the catchment area, discharges into a pipe-head tank with a capacity of about 250,000 gallons. From there, a 3-in. main is laid to Wallan Railway Station to supply the railway, and a further 5-in. pipe leads into a service basin at Kilmore of 1,250,000 gallons, being increased to a further 3,000,000 gallons. This pipe has a capacity of 90,000 gallons for 24 hours. Obviously, the present supply is not sufficient, and attention was, therefore, given to the question of how to increase it. On the northern side of the Dividing Range, about 1½ miles to the east of the present catchment area, there is a creek with a watershed of about another 1,200 acres, and a storage reservoir could be provided at a reasonable cost—estimated at £10,000. Given this extra storage, the reservoir would give 200,000 gallons a day in Kilmore. That would require a further 6 in. main 14 miles long, at a cost of £28,000. This would practically follow the line of the existing 5-in. main, and collect into the service reservoir at Kilmore. Should 700,000 gallons be required, a further 7-in. main would be necessary at a cost of £30,000. Roughly, for the 200,000-gallon scheme, the expenditure would be £40,000, and for the 700,000-gallon scheme, £54,000. I do not consider that, even with the additional catchment area—the only one available—the scheme at Kilmore would be equal to 700,000 gallons a day for twelve months; I would not put the capacity of the area beyond 200,000 gallons, and I fear there would be a shortage of water. There is a total of only about 3,000 acres, and, while it is a very fair watershed, it is not as good as at Seymour. Kilmore is at the top of the Dividing Range, at a level of 1,375 feet, and there is no other water available. The Goulburn is some 30 miles away, and there is nowhere else to look for water, even by pumping. The present supply at Seymour is the property of the Seymour Water Trust, but the money will have to be found. We have dealt with the matter on the basis that we could not expect the Trust to find the money without our paying interest, sinking fund, and maintenance. It is a public expenditure, as we regard it, and it would be a matter of agreement with the Trust and the State Rivers and Water Supply Department. I do not think there would be any difficulty about it. No undertaking has been received by the Department from the Seymour Water Trust in regard to the conditions under which they are prepared to supply water, but such undertakings are not usual until the project is really approved; and it takes some time to go into these matters. It is only for fire protection that we need the water supply in the case of the buildings, and this will not affect the other conditions. I think that an agreement will be arrived at, as is usual in such cases, whereby branches can be taken from the fire main to sinks, and the water paid for by meter, the supply for fire purposes being represented by a small sum per annum.

89. *To Mr. Mackay.*—These are not ammunition dumps that are proposed, but ammunition stores, safeguarded by distance. I see no more objection to these ammunition stores than to a truck load of dynamite going by the railways through our towns.

90. *To Mr. Parker Moloney.*—I do not think that it is possible to get a site in the camp site for a mobilization camp. I have no idea what price is asked for the 47 acres for the mobilization camp, other than the evidence the Committee heard at Seymour the other day. That evidence agrees roughly with our idea of the value, but that is dealt with by another Department. The stores will have the benefit of the pumping system as well as the mobilization camp; but that will not obviate the necessity for an additional reservoir. The additional reservoir I suggest, at the head

of Falls Creek, is for dealing with 700,000 gallons per day, assuming that the mobilization camp is for 30,000 men and 20,000 horses. The 700,000-gallon scheme has nothing to do with the stores, but is in connexion with the camp. There is no possibility of getting sufficient water at Broadmeadows camp without an additional main. The length of such a main would be 11 miles, and, as I said before, would mean a cost altogether of £43,000. I am very much taken with the water supply at Seymour. There is the river within 55 chains in case of anything happening, and then there is a tremendous watershed and a storage reservoir. Whatever happens, we have water there.

91. *To Senator Needham.*—I saw the gravel and sand at the river bend at Seymour. The mobilization and equipment stores will have iron walls and roofs, and brick floors for the vehicle sheds. I do not think that, if cement could be obtained, it would be more economical to have concrete construction, although the gravel and sand are there. I think that, even with the present price of bricks—about 46s. per 1,000 at the kiln—a brick floor is just as economical, and is the best proposition. The gravel there is good, but we have to add the cost of the cement, the screeding, laying into place, and so forth. On the other hand, if any repairs are necessary, a concrete floor does not lend itself so readily to maintenance as does a brick floor. Working it out the other day, we thought both came to just about equal cost. The gravel, as I say, is good, but it is just the ordinary river gravel that you strike in the Ovens and other rivers. Of course, if bricks were to go up in price half as much again, we should probably go in for concrete, but at present prices I prefer the bricks. It would be wise, if the Seymour site is recommended, to continue the railway into the camp site, because it would save money in cartage, and be very useful. It would mean another 2 miles of railway, approximately. The grade offers no difficulties, and the cost would be £12,000 or £15,000. I preferred duplicating the pumping machinery as against increasing the power of the present pump, because we must have a stand-by. For the 200,000-gallon scheme, I would not duplicate the engines, because I think the Falls Creek storage could be developed to give that quantity; I would only duplicate the pumping for the 700,000-gallon supply. At present there is no need for duplication, but it would be necessary for the larger scheme. In the meantime, I would not suggest an increase of power in the present pumping, but would rather spend money on duplication, leaving the pump as it is for the present. I do not know that I would duplicate in oil, but possibly in steam, which I think is cheaper to install and cheaper to work. I think the head waters could be developed more than they are now. It would be a good idea, as suggested the other day by the Chairman, that the caretaker's cottage should be put in another position, with a view to moving the whole structures 30 feet further from the roads.

92. *To Mr. Atkinson.*—The effluent from the sewage from the camp is allowed to reach the Goulburn through the creek at the northern boundary of the mobilization stores site, but that is many miles below where the water supply is taken off. The camp sewage discharges, by a long length of pipe, into a site on Whitehead's Creek, about a mile above the mobilization store. There it is treated with lime, and any effluent flows down Whitehead's Creek below the town of Seymour. If there were any danger, that could be obviated by putting in proper treatment tanks. Part of the proposition is to have a direct pumping plant from the Goulburn to the camp. The service reservoir will be only 60 feet higher than the present service reservoir at Wallis Hill, and the existing pump could do the work. The cost of this has been reckoned in my figures. As to the water supply at Broadmeadows, I should like to put in the following report:—

WORKS AND RAILWAYS.

Supply of Water for Fire and Ordinary Purposes to the suggested site for Ordnance Stores at Broadmeadows, Victoria.

The Director-General of Works:

The site as suggested by you is at the reduced level 410 feet above sea level, and while it is possible to be connected from the Melbourne water supply, a continuous pressure in the mains could not be maintained in hot weather, and it will be necessary to provide local storage to the extent of, say, 100,000 gallons for fire purposes, and 50,000 for ordinary purposes.

To better understand this question of pressures of supply, I have prepared and attach hereto a small tracing showing the relative position of Broadmeadows and the Melbourne water supply, from which it will be seen that the Broadmeadows camp is at present supplied with a 6-inch pipe taken from one of the two 30-inch mains from Yan Yean reservoir to Preston, the level of the Yan Yean reservoir being 602 and the Preston service reservoir 328. During hot spells these mains are taxed to the utmost capacity, and discharge with a free outlet at the 328 level at Preston, giving a level at the Broadmeadows camp during such periods, of not more than 400, but in cooler weather, when the mains are not discharging at the fullest capacity, the Board of Works office advises me that water can be supplied at about 485 level, certainly not any higher, and that local storage is necessary for one week's supply.

The chief officer of the fire brigade, to whom I have explained the matter, has kindly advised that 100,000 gallons storage will be sufficient for fire purposes, the other 50,000 gallons would appear to be equal to maintaining requirements of the staff, &c.

To obtain this necessary storage at 485 level two methods might be adopted, either by an elevated reinforced concrete tank or by an ordinary concrete reservoir built on the ground level. The level of 485 could be obtained at about 2 miles north of the proposed site of the stores, and the most economical would be the latter proposal, and such reservoir together with, say, 2 miles of cast-iron pipes, with necessary easement for private property, would cost £6,000 approximately, to which would have to be added the cost of the necessary reticulation, fire hydrants, sprinklers, or other appliances that would be required in and around stores, and which cannot be estimated until a plan of the layout and extent of buildings is available.

T. HILL, Engineer.

9th January, 1919.

To that £6,000 I add £500 for twenty hydrants, £150 for 4-inch mains, or, say, £7,000, as compared with £4,650. At Kilmore we could connect with the service reservoir, the capacity of which has been increased. As to whether I see any advantage in having these stores at Broadmeadows or Kilmore instead of Seymour, I understand that what we are considering is a matter of mobilization, and that the important thing is to have the stores near the mobilization centre. There must be a good camp site with stores, and all the accessories necessary for mobilization, alongside,

and Broadmeadows does not conform to those conditions. At Broadmeadows the water supply would be expensive, and the site is not so good; moreover, the site there is hemmed in by a lot of occupied country, and the railway facilities are not so good. I can hardly see any good points about Broadmeadows other than as a bare stores proposition, and even then the stores ought to be adjacent to the concentration camp. Around Broadmeadows, for the reasons I have given, is not a good training ground, even for the Citizen Forces. I know the country around Seymour well, and from my inspection I think there is no other site so suitable for mobilization stores—so suitable in every way, and particularly as a building site.

93. *To Mr. Ramford.*—If a fire broke out at the stores I think that a caretaker could cope with it if he got reasonable notice. I had been expecting that I should be asked whether I would suggest the sprinkler system of extinguishing fires. I think that sprinklers should be placed in some of the buildings, and in others there might be fire alarms. I think that in this class of building a man would be able to keep a fire under until the arrival of the brigade. We always take care to arrange for communication with the fire brigade; for instance, I consulted Mr. Lee as to the hydrants, and so forth. There would be a telephone laid on to the fire brigade. I do not think that a galvanized corrugated iron wall is sufficient to protect ammunition, and that probably it will be done in brick. However, there are no plans before you for ammunition stores; the iron walls are only for the vehicle sheds and stores. I think that the railway on to the site should be constructed while the ground is being levelled up and other preliminary work being done; the railway would be ready, I fancy, by the time we were ready to erect the buildings. As to sanitation, it is not contemplated to have a large number of men there; the larger number would be at the camp site. If there were a sudden concentration of men we could use the town sealed-pan service until we could provide other accommodation. There would be no difficulty in installing a water service, if necessary, with septic treatment. I would not recommend a destructor, but prefer water carriage treatment. The creeks into which the effluent discharges are not used for drinking purposes. The effluent runs to the north of Seymour, which has its own water supply. If the effluent were likely to pollute the creeks I would put in further sand filtration in addition to septic tanks. This sanitation is a difficult problem when one is dealing with a large number of men, but it is not proposed to have men there in the day time, for they will then be at the camp site.

94. *To Mr. Mathews.*—I should say that if the camp were not at Seymour the stores would be useless. The water sheds of reservoirs are generally kept free from pollution, animal or human. The Yan Yean watershed is particularly good in that respect, but other watersheds are not. I do not think that the water in the Goulburn River at Seymour is likely to be polluted, seeing that the watershed is so large. There are only two small towns on it, Alexandra and Yea, and the river, with its ripples, is so long that it purifies itself in its flowing. The conditions in this regard are particularly good on the Goulburn. There is very small settlement on the river beyond those two towns, and what cattle there is does not hurt the water. The water on the Goulburn comes from a watershed of thousands of square miles, and, as I say, there are very few people settled on it. The Goulburn watershed, as a whole, is less polluted than is the Falls Creek. There is no filtering lower down the river. The Goulburn water is discharged into channels, and ultimately reaches the Mallee and the Wimmera. I suppose some time there will be a population of many hundreds of thousands of people in that part of the country, and there does not seem to be any fear of any contamination. The Goulburn is particularly a pure stream, but if at any time difficulty arose sand filtration beds could remove it. I do not think filtration beds are essential at the present time, and most of the towns in Europe and in England are supplied from streams much more contaminated. The Melbourne water supply is from Yan Yean, and there are other reservoirs. The supply from Yan Yean is reliable, but it is no more reliable than the Seymour supply by pumping from the Goulburn. If there were a direct water supply from Yan Yean to Broadmeadows it would require 12-inch and 7-inch pipes for the 700,000 gallon scheme and the 200,000 gallon scheme respectively. The supply at Liverpool camp is the Sydney water supply from the Nepean, and is from a 9-inch main near the Liverpool railway station. There is a pretty good head there of something like 400 feet.

95. *To Senator Newland.*—There were two railway connexions considered at Broadmeadows, one from near the railway station, which would not have been difficult, and the other from the Somerton line, which is not now used. The connexion with the Somerton line would have been comparatively simple, but, as I say, it was a line that had been put out of use on the outer circle, and it would have required relaying and re-bridging, involving considerable expenditure. I do not think we ever prepared actual figures regarding it. The cost would have been much greater than at Seymour. The Victorian Railway Department did not put any obstacles in our way, but they pointed out the difficulties. At Kilmore, so far as could be seen, the railway access was quite reasonable. At Seymour the proposed railway will go through a small area of land which has not yet been acquired. The railway would cut this land in two; and, in view of what would have to be paid for compensation for severance, it would be better to acquire the whole of the land. As I understand, it is anticipated there will be an increase in the number of stores, and magazines will have to be erected; but no report has yet been made on these. These extra stores are included in the plans submitted to the Committee, but that is not so in regard to the ammunition stores. The railway men do not like concrete sleepers as yet. The Victorian Railway people could run any class of engine over the secondhand 60-lb. rails, though not, of course, at a high speed. Those rails are used at many sidings at the present time, and there would be no difficulty about any train going into the camp. It is possible to construct another reservoir in the neighbourhood of the head works on Falls Creek watershed; in fact, I have included in the 700,000-gallon estimate an additional reservoir at a cost of £6,000. I would use the old pipe headway, and construct ripples down the bed of the creek. The Seymour site, in view of the training of large numbers of men, is superior to the Broadmeadows, but not to the Kilmore site. The Kilmore site is very good ground, with good drainage and other advantages. The area is suitable, and not too expensive. At Broadmeadows it would be very expensive to make the site at all suitable. From a sanitary point of view the Broadmeadows site and the Kilmore site are about the same; the treatment of the sewage would be about the same. Speaking generally, I think the Seymour site is more healthy than the Broadmeadows site; at Seymour the nature of the ground is better, and the air is better; it is 300 feet high, approximately, and altogether preferable. But Kilmore from that point of view is even more preferable, for it is 1,300 feet high. I think Kilmore is out of the question on account of the water supply, for it is equal to no more than 200,000 gallons a day. I would like sprinklers to be installed in the stores, but not in the vehicle sheds. I have prepared

an estimate for sprinklers, and to instal them in the two stores would cost about £1,000 each store. Future instalments there would drop down to about £800, because the service reservoir would be common to all the buildings. These sprinklers require an independent reservoir, and for the two stores there would have to be one of 1,500 gallons at a height of 20 feet above the sprinkler head. A fire alarm installation would cost very much less, and it would do for the vehicle stores.

96. *To Mr. Mathews.* — The cost of the sprinkler heads for each store would be £750, with an added £300 for the storage tank, or £1,800 in all. If we place sprinklers in only one building the tank would still have to be provided, and the total cost would be £1,050. I think that Mr Lee, of the fire brigade, would advise sprinklers in addition to a watchman.

(Taken at Melbourne.)

WEDNESDAY, 12th MAY, 1920.

Present:

Mr. GREGORY, Chairman;

Senator Needham,	Mr. Mackay,
Senator Newland,	Mr. Mathews,
Mr. Atkinson,	Mr. Parker Moloney,
Mr. Bamford,	

Frederick Bruno Frinsdorf, Manager Construction Department, Gardner, Wern, and Company, City-road, South Melbourne, sworn and examined.

97. *To the Chairman.*—I desire to bring under the notice of the Committee the possibilities of my firm's patent construction process known as "Gawco," and I exhibit model framework construction. The system is based on the principle of a standardized unit, and was worked out because of the need for the construction of fireproof sheds, which could be transported at small cost and re-erected without skilled labour. The size of the shed also may, by means of the standardized units, be increased or decreased in order to meet varying requirements. In order to satisfy the Committee as to the efficiency of the system, I present the results of tests made by Professor Payne at the Melbourne University. The outside joint which falls on the bottom member of the unit, was tested for tension by pulling in a direct line on the tensional members of that unit, and fracture took place with a pull of 15,680 lbs. (a little over 7 tons) in the tubing 3 inches from the casting, thus proving that the joint was stronger than the member in the construction of the unit. In order to demonstrate that this was not a fluke, Professor Payne said he would like to test the compression members for tension. The compression member is only half as far in the casting, as there is no pull on it. In the test fracture occurred at 7,220 lbs. pull, the top of the tubing being pulled off. It was noticed that the end of the pipe was bent, thus evidently weakening the joint. We considered that this was a very satisfactory test for compression members, and went ahead to devise joints whereby the units could be made interchangeable. After a great deal of trouble we settled on joints which dovetail into one another, and we devised units that would pack in small space for transport and erection without expert knowledge, as they fit into one another. I submit plans of a 10-feet unit. We had other difficulties. The joints had to be so made as to allow of all forms of bracing, and in the spans there are spare holes to permit of this cross bracing. The purlin seats are cast in the making of the unit, so no special knowledge is required to place everything in position. All the units are brought together, and then the purlins are clamped on preparatory to the process of roofing, and the whole structure is rigid at once. The galvanized iron braces the structure quite efficiently. We consider any cross bracing of the roof principle to be unnecessary, as galvanized iron is quite strong enough. It is immaterial how many purlins are required. Some architects specify 2 ft. 3 in. centres and some 4 ft. 6 in. We have struck the medium at 3 ft. 3 in., but the purlin seats may be shifted to any position required to meet the needs of the builder. At present we are under contract to erect on our unit system a big jam factory in Adelaide for McEwins Limited, to cover 3 acres of ground. We can provide spans from 20 feet to 60 feet without any intervening supporting pillars. For a greater span than 60 feet it would be necessary to use larger sections; but we find that a 60-feet span without a supporting base is never asked for. It is very difficult to get skilled labour, especially in the country, but our system of standardized units obviates trouble. We usually send one competent overseer, a man who is familiar with our work, and all he requires is the help of a few hefty men to put up a building. If galvanized iron is used for the walls, and is placed on the outside of the units, there will be greater storage space within the building. For the sweating pens of shearing sheds, the iron is placed on the outside, but at the shearing board itself it is attached to the inside of the framework in order to remove any danger of shearers knocking their heads against the purlins. This question of having the iron on the outside or the inside is one that must be determined by the nature of service required of a building. The walls being on the slant, wind pressure is reduced considerably, and we consider this an important factor.

98. *To Mr. Bamford.*—We recently furnished the roof principals for a new factory in Richmond for Pelaco Limited. That has a 40-feet span, and is erected on ordinary brick walls. It was a difficult contract, as we had to bend the principals in order to get them in, and allow them to spring back into position. I feel confident that I could arrange with the manager of Pelaco Limited to allow members of the Committee to inspect that building. The Adelaide factory, to which I referred, will be one of the largest in Australia without intervening walls of any sort. We also supply units for a saw-tooth roof in order to give better lighting conveniences, and we make lattice girders on the same principle. The cost of a 20-feet span works out at a little less than oregon roof principals. It is designed to carry the same load, but as a matter of fact it carries a little more, and in addition our system gives a fireproof building. There will be no difficulty in erecting mobilization stores and other buildings at Seymour on our unit system principle.

98A. *To the Chairman.*—We also submit plans of a building in Adelaide, with upright walls and with span roof unit principals for the Adelaide Milling Company. We can accommodate our system to any design of building. It is merely a matter of working out the details. For aviation hangars we provide a span of 60 feet by 40 feet deep, to accommodate two machines. The span unit and the cast joints, I may add, are made on the principle of the old-fashioned cast-iron bedstead. All the details have been most carefully worked out. There is provision for extra bracing if required, and for the

addition of ventilators in the top of the roof principal units, the ventilator becomes part of the roof trusses. The whole design has been worked out to allow for standard wind pressure of 30 lbs. per square foot, based on the experience of the Brighton cyclone. We supply hook bolts for the roof principals, and the cost of fixing galvanized iron would not exceed very much that of nailing galvanized iron to wooden purlins. The bolts go right through the overlapping sheets of iron, and there is provision for a box or ordinary gutter, a 4 x 2 in. batten and mold board being fixed in the ordinary way. It is advisable in most localities to make this provision for gathering roof water for boiler purposes. We are prepared to quote costs for buildings. For foundations we advise concrete blocks. The concrete for a 5-ft. 6 in. spread would be 8 feet x about 15 inches and 18 inches deep. Into this is grouted the bolts, which are passed through holes in the feet of the principals, thus making everything a good firm job. If considered advisable, the walls may be constructed of ordinary building materials, as our roof principals are adaptable to any style of building. With our present sections we could erect a building with a 62-feet span. The proposed equipment stores at Seymour offer no constructional difficulties. Our units would give a 50-feet span without any centre supporting column. There is provision for covering the ends in the ordinary way, and for as many doors as may be required. The proposed carriage sheds at Seymour could likewise be erected on our unit system. The cost for roof principals would be £55 per ton for any span up to 62 feet. A 50-feet span, taking the truss itself, would cost £20 10s. To this estimate must be added the cost of purlins, 11d. per foot. I estimate roughly that a roof 300 feet long and 100 feet wide would cost £6 per square, including purlins and roof trusses complete. This estimate does not include corrugated iron, which at present is about 6s. per square yard on the roof, but the price is altering every day, so that it is almost impossible to give an exact figure.

99. *To Mr. Bamford.*—The roof trusses are 2 inches x 4 inch mild steel tee, and the compressional members are of black tubing, varying according to the size of the unit. The tie rods are of mild steel. The whole framework, with the exception of the joints, is of mild steel, constructed, as I have stated, on the same principle as the old-fashioned bedstead. Wherever cast iron meets cast iron we insert lead washers to take up any expansion or contraction. We insert these as an extra safeguard; not because we think them necessary. Once the galvanized iron is bolted on to the purlins the whole structure is absolutely rigid. There is no possibility of movement, as in the case of galvanized iron nailed on to wood purlins, because with timber there is always the chance of a nail pulling out under pressure. If cross bracing were considered necessary, it could be done without altering units in any way. We are putting in cross bracing on some of the shearing sheds which we are erecting in order to carry the shafting.

100. *To the Chairman.*—A 50-feet principal would cost about £20 10s.

101. *To Mr. Mathews.*—For a 50-feet principal, sixteen purlins each 10 feet long, would cost about £8. I should like to emphasize the point that it is not necessary to use mild steel angle purlins. Timber purlins may be used with our roof principals. Pelaco Limited put in oregon purlins because they had the oregon on the job. Our mild steel angle purlins cost a little more than hardwood, but all the work is done in the engineering shop, and in addition we supply all fish plates and bolts necessary to bolt them on to the roof principles, whereas timber has to be prepared and bolted on in the ordinary way.

102. *To Mr. Bamford.*—We would be prepared to quote for roof principals only, if required. In fact that is our main object. Of course we supply the side frame work units also if we can, but we aim at supplying the roof principals, and we find the demand so great that we are overwhelmed with inquiries from all over Australasia and right up through the Malay States.

103. *To the Chairman.*—The roof on the proposed equipment stores would be easy of construction on our unit system. We have no objection at all to giving a quotation for the roof. It is about twelve months since we finalized our system, and commenced work on it, so it is not possible to point to any large building in which it has had a lengthy trial, but we have the same style of roof principals in our own engineering shop. They have been up for five years and are thoroughly satisfactory in every respect. We lifted a 4-ton oil engine on them, so they are strong enough. So long as the units get a coat of paint occasionally there will be deterioration whatever.

104. *To Senator Needham.*—We have brought our system under the notice of the Naval authorities, with the idea of introducing it in the construction of hangars. Lieutenant C. J. and Colonel Owen who inspected our models, apparently had no fault to find with the principle, which is similar to that adopted in the erection of hangars elsewhere in the world. We had a model building on exhibition at the last Melbourne Show, and at present we are preparing the units for a big shed at Deniliquin, and another at Wagga, in New South Wales. For a big span of roof I certainly think our unit system is cheaper than the ordinary style of construction, based, of course, on the present cost of oregon. In addition it is fireproof. Of course, if a couple of hundred tons of copra were set on fire inside the building, it would be badly damaged, and so would any other fireproof construction. We guarantee the building itself to be fireproof, and claim that small section units will not buckle like big H girders, and so the building would not be damaged by fire. I should imagine that the equipment to be housed in the Seymour mobilization and equipment stores would not be of a highly inflammable nature. Frequently shearing sheds have been burnt down as the result of men crawling underneath to have a smoke and being careless with matches. We claim that sheds built on our system cannot be destroyed in that way. The roof sections can, if necessary, be strengthened. We have not had a great deal of trouble in obtaining material. Supervision of erection would be a very small item compared with the total cost of the building.

105. *To Mr. Bamford.*—The weight of the principals in a 50-feet unit would be about 7½ cwt. If it were found necessary to shift the stores, say in war time, a big gang of men could carry out the work very rapidly and without damaging the structure in any way whatever. And in re-erection, if it were thought advisable to have a smaller building, fewer units could be used.

106. *To Mr. Mathews.*—The system has been thought out by Mr. Wern, and it is Australian from beginning to end.

107. *To Senator Newland.*—The units are so designed as to take any size or kind of doors. We have had all sorts of extraordinary schemes submitted to us, especially for aviation hangars. In some cases we

have been asked to provide for four sliding doors, or doors which fold, on the German plan; and in every case we have been able to overcome any difficulties.

108. *To Mr. Mackay.*—Provided there were no delays in the delivery of raw material we could, with our present plant, turn out six 60-feet principals per day, but we have already arranged to duplicate the plant in order to push on with the Adelaide work, and we could easily extend it further to meet any probable needs. At short notice we could duplicate it again, making it four times as large as at present. We would have no objection whatever to officers of the Works Department consulting with us in regard to our submitting a scheme for the construction of the Seymour buildings. We would welcome their help in any way. Every architect to whom we have submitted our scheme has approved of the method.

109. *To Mr. Parker Moloney.*—We provided only the roof for the new Pelaco building, and the erection occupied only a couple of days. They wanted a roof in a great hurry, and we were able to do the work straight away. I judge that our system was cheaper than an oregon roof, but I could not say by how much. The architects asked me over the telephone what we could supply the roof for, and when I told them, they instructed me to go ahead with the work. I could not say just how long it would take us to supply all the material for the equipment stores, should we be asked to carry out the work, but the actual erection is a very small matter. Men would lift and fix one of the principals per hour, so the work would proceed very rapidly. I can guarantee that our roof principals would be fixed in position before carpenters could cut oregon principals to the templets, so work on our unit system would be much more expeditious. For the erection of an ordinary building 300 feet by 100 feet wide one good foreman in charge of a number of unskilled workmen could carry the job through quite satisfactorily, because all the units are mathematically correct, and they must fit together. All the preparatory work in connexion with our units is done in the engineering shop. I could give an estimate within twenty-four hours for the erection of the mobilization stores at Seymour.

110. *To Mr. Mathews.*—The upright units will be able to stand the shock of a fairly heavy collision, but if a couple of horses attached to a four-ton lorry should happen to bolt and collide with one of the upright units, of course it would fracture, but there would be no danger of the building collapsing. Only the unit that sustained the shock would be damaged. The building itself would be held in place by the purlins and galvanized iron, and the fractured unit could be replaced without difficulty. There is, of course, very little danger of a collision.

111. *To the Chairman.*—It is a comparatively easy matter to duplicate our plant. If we were required to carry out the work at Seymour, within a limited time, we could do it by increasing our plant to meet all requirements. We have not yet met an architect who has disapproved of our unit system. Of course we do not go round asking engineers to criticise it, because in the majority of cases they are in opposition to us. I can say, however, that architects have approved of that system. The architects for McEwin's building in Adelaide, Messrs. Garlick and Jackman, recommended their clients to adopt our system, and Messrs. Oakden, Ballantyne and Hare, Melbourne architects, gave us the order for the Pelaco building roof. Generally architects approve of it, though we have not brought it before them as a body. From a selling point of view it has not been necessary to do that.

(Taken at Sydney.)

MONDAY, 17TH MAY, 1920.

PRESENT:

MR. GREGORY, Chairman;

Senator Newland	Mr. Mathews
Mr. Atkinson	Mr. Parker Moloney.
Mr. Mackay	

George John Oakeshott, Works Director for New South Wales Department of Works and Railways, sworn and examined.

112. *To the Chairman.*—I have been engaged in the erection of equipment and vehicle stores at Liverpool similar to those proposed to be erected at Seymour. In this work there has been complete collaboration between my department and the Department of Defence. My department is merely carrying out the work in accordance with the desires of the Defence Department. All the details of the work, even to the preparation of the plans in sketch form, were settled in Melbourne, and I received direct instructions from Colonel Owen, Director-General of Works, to proceed with the work in accordance with the plans submitted to me. The Director-General of Works took a great interest in the planning of these buildings, and he was in direct touch with the Defence officers, who were particularly concerned in the proposed work. The result was that I was given a settled scheme to carry out. The stores erected, or in course of erection, at Liverpool are for the purpose of housing equipment, vehicles, and ammunition. The equipment stores are being constructed of wood and galvanized iron. I consider buildings of that character quite suitable for the purpose. They are weather proof and well ventilated, and although they may involve more risk of fire than would buildings erected in brick or concrete, yet ample safeguards in that respect have been provided. I should think that the equipment stores which have been erected at Liverpool would last quite forty years. Hardwoods are employed, but I cannot recollect for the moment the particular varieties that we used. The timber used in the ground was of mixed hardwoods. The posts were both tarred and charred, and hardwood treated in that way has a life of many years. Some hardwood timbers when put underground without any treatment have a very brief life. The floors of the equipment stores at Liverpool have been raised to railway platform height. The height of the walls from the floor to the wall-plate is 11 feet. Each store is 228 feet long by 60 feet wide, the roof being in three spans of 20 feet each. It is sub-divided by brick walls into three compartments. Each bay is roughly 20 feet by 16 feet between the storey posts. The roof has three trusses, supported on two storey posts, and treated in queen-post fashion, and two half-king posts on each side. The plan for the Seymour buildings is very different; there each store will be 100 feet wide, and the spans will be 25 feet, as against 20 feet at Liverpool. Each bay will be 25 feet by 16 feet. Of course, an increase in the span means an increase in the cost of a building, because it involves the use of heavier timbers. The proposal for the roof at Seymour is more expensive than that at Liverpool, owing to the addition of a lantern light. The stores at Liverpool have small windows just under the eaves. I think that the lighting is sufficient for a building with a depth of only 60 feet. I do not think that light steel principals would be more effective than oregon. The type of roof shown on the drawings is the cheapest that we could possibly get at the present time. Steel would be more permanent, but it would cost almost twice as much as oregon. I have heard of the Gawco process of steel construction, but I have never seen it in operation. I am not prepared to say positively how much cheaper a building could be erected in oregon than in iron, as oregon is very dear in the market to-day. The ceilings of the equipment stores at Liverpool are lined with timber. That is for the purpose of keeping the building cooler and preventing condensation of moisture and consequent dripping upon the clothing and other stores. It was not considered necessary to line the walls because none of the stores will touch them. There is no doubt that a solid concrete or brick building could be made absolutely perfect for the storage of leather, clothing and other military stores, but those buildings which have been erected at Liverpool, are more or less temporary. One reason is that we were very much pressed for time, the stores being actually en route to Australia when the buildings were started. The second reason was economy. I believe that from the present structures we shall get reasonably good service. I cannot say what the price of brick work at Seymour is to-day, but I should estimate that the substitution of brick walls for iron walls would increase the cost by 20 per cent. to 30 per cent. In the Liverpool buildings there is a space between the floor and the ground, and if the buildings and surroundings are periodically cleaned up, I do not think there will be much danger of fire through the accumulation of papers and rubbish under the buildings. If these were ordinary ordnance stores, with goods constantly passing inwards and outwards, there would be some danger in this respect, but it will not be very great in connexion with mobilization buildings the stores in which are not likely to be moved out frequently. Any rubbish that accumulates when stores are being taken into the buildings will be cleared away, and I do not think there will be any further danger. There is not likely to be any trouble through the setting alight of dry grass, because all the surroundings and approaches will be gravelled. The buildings most adjacent to the equipment stores will be the hospital group, which will be situated about 8 chains from the corner of the equipment stores block. No decision has been made in regard to the fencing of the area. It will be for the Defence Department to determine what amount of protection of that kind is required. I do not think it is necessary to close in the space that is now open between the ground and the raised floor.

113. The vehicle stores which are in course of construction are each 228 ft. by 80 ft.; they are in spans of three-storey posts; each bay is 20 ft., by an average of 16 ft. The height of the wall plate is the same as in the equipment stores, namely, 11 ft. I cannot say whether it is necessary to carry all the walls of the vehicle stores to that height, because I do not know what types of vehicles are to be accommodated there. My responsibility ends when the building is completed; the Defence Department may fill it as it chooses. The vehicle stores I have erected up to the present have been enclosed all round. Four additional vehicle stores which are to be built are to be left open on one side. The folding doors that have been built on the completed stores have not been a very great success. I do not anticipate any trouble from wind storms through one side of the building being left open. The open side has a northerly aspect, whereas the stormy winds blow almost entirely from the south south-east and south-west. I have not heard of any trouble having been experienced with the buildings on account of winds during the course of construction. In regard to the doors, I think that it would be better to make them in smaller sizes and not so high. If doors are necessary at all it would be better to build them on the shutter principle so that they could be unhinged; that would not be a great inconvenience because the vehicles would not be inspected or handled more than once or twice a year. In regard to the width of the vehicle entrance, if all that is desired is a straight drive, 9 ft. is a sufficient width, but if it is desired to enter obliquely in order to manœuvre the vehicle into a particular position in the store it is necessary to have a greater width. I do not apprehend any danger to the completed buildings which have one side open; they are so well tied in that winds are not likely to do them any damage. The risk would be serious if the open sides had a south-westerly or south-easterly aspect. The only inconvenience that might follow from having doors at each alternate bay instead of at every bay would be that the bay which was fronted by a solid wall would be very difficult of access and the manœuvring of vehicles in and out would be troublesome. The purpose of having doors along the whole of one side of the building is that vehicles may be taken straight into their respective bays without a lot of difficult manœuvring. I do not expect that the doors on the Liverpool stores will last very long, especially with the rough usage they will get from the ordinary soldier. It would be better to have movable shutters which could be taken down when the vehicles in any particular bay were required. I would not advocate shutters for an ordinary vehicle shed, but they would be suitable for buildings from which the vehicles would be taken only once or twice during the year. That arrangement would certainly be economical. The sanitation provided at Liverpool is the pan system. That is sufficient, as there are not likely to be many men employed there. I have heard of the American Keustine system, theoretically, it sounds good, but I have no knowledge of it in practice. The caretaker's cottage at Liverpool was built by day labour.

111. *To Senator Newland.* The brick walls which subdivide each store reach to the roof, but do not actually pierce it. The purlins pierce the wall. I think that that arrangement is quite safe against fire; the brick wall we built more with a view to checking fire in the case of an outbreak amongst the contents, rather than with a view to creating a fireproof building. Of course, it would be better if the wall passed right through the roof, and there were no timber connexions, but that arrangement would be much more expensive, especially on account of the lead flashings along both sides of the wall. I repeat that the brick wall was intended only as a check. For protection of the buildings against fire we rely upon the hydrants, the chemical extinguishers, and careful watching. There is an excellent supply of water and the hydrants are so placed that water can be played upon every spot inside and outside the building. Within reason every precaution against fire has been taken. The floors of the stores are supported by wooden posts, which are hardwood 6 x 6 inches. They are not let into concrete; they were simply charred and tarred, and let into the earth. That is the best possible way of preserving timber; the charring prevents deterioration by dry rot, and also checks the ravages of white ants. We could make a better job by setting the supports in concrete, but it would be a more expensive one. White ants are troublesome in the Liverpool area, but they are not present in the immediate vicinity of these stores. White ants do not attack so readily timber that is open to air and light. I would not suggest the enclosing of the space between the floor and the ground, but if it were decided to do that it would be best to use corrugated iron or wood sheeting. Poultry wire netting of 2 inch mesh would do quite well for the purpose; it would prevent papers and other rubbish accumulating under the building, and would at the same time admit plenty of light and ventilation. My objection to a wooden enclosure is that it would make the building damp, and increase the danger from white ants. If the buildings were constructed with flatter roof a small saving in galvanized iron might be effected. The pitch was determined by the construction of the trusses; the flatter the trusses the stronger must be the timber. Therefore, whilst the flat roof

might economise a little in respect of iron it would be more expensive in respect of timber. The walls of the vehicle sheds are 11 feet high, and the doors 10 feet high. A brick floor is quite satisfactory for a building of this class, as it is cheaper than concrete. Concrete, in order to prevent crumbling, must be given a good smooth surface. A brick floor is very easily repaired, and I think it is quite good enough for the purpose for which it is to be used. I estimate that a brick floor is about 7s. per square yard cheaper than concrete flooring. Undoubtedly a building that is open on one side is subject to more wind pressure than is a building completely enclosed, but the openings of these buildings at Liverpool are on the lee side. I think the present arrangement is quite safe. Dust may blow in, but there would be very little trouble from rain. Vehicles that were close to the openings might suffer slightly, but those even only half way back would not be affected by either sun or rain. The very trying suns of summer will not affect the vehicles at all, because they will be under shelter, and there will be no trouble from rain. The Defence Department officials are of opinion that the protection provided at Liverpool will be sufficient.

115. *To Mr. Mackay.*—We have built at Liverpool four mobilization stores and four vehicle stores. We are now constructing four additional vehicle sheds, making a total of twelve. The first block of buildings was erected by contract under the supervision of the State Constructor of Public Buildings. This Department carried out by day labour all the services, such as drainage, storm water, hydrants, and foundations for the vehicle sheds; the rest of the work was done by contract. The vehicle sheds cost £3,333 each; the additional four are estimated to cost the same amount, but the figure may be increased owing to a rise in the cost of brickwork. It is estimated that the eight vehicle stores will cost £26,664; the four mobilization stores, £4,197 each; roads, storm-water drainage, fire and water mains, clearing, &c., carried out by day labour, £11,506; about 68 chains of railway siding, which was built by the Railways Commissioners, £5,045; caretakers' quarters, £610. This makes a grand total of £60,163, including the estimated liabilities. We are also building four ammunition magazines, the nearest of which will be 22 chains from the vehicle sheds. There is to be a space of 9 chains between each row of ammunition sheds. I have not heard of any proposal to construct protective earthworks about them. I do not think that an explosion in one magazine would affect others.

116. *To Mr. Atkinson.*—The buildings at Liverpool ought to have a life of at least 40 years. It is wonderful how long hardwood and iron buildings will last when they are away from the sea. I have known temporary galvanized-iron structures in the country to last as long as a brick building, but I would not guarantee such a building for more than 40 years. The purpose for which these buildings have been erected at Liverpool is the temporary storage of Defence material, and they are certainly most suitable, having regard to the limited money and time we had at our disposal. No more economical buildings giving the required efficiency could be erected. The doors of the Liverpool stores are not recommended for repetition. In the first place, they are too light in scantling; and, in the second place, a double-leafed door is never a success, because too much weight is thrown on the hinges. There is much to recommend the sliding doors, because they would not get in the way of incoming and outgoing vehicles. The drawings of the proposed buildings at Seymour represent an improvement on those at Liverpool; they are to be better lighted, and there are to be fewer storey posts to get in the way of vehicles. I could improve the buildings at Liverpool if I were allowed more money, but the provision of a really permanent structure would mean a big increase in expenditure. For instance, the floor would be solid, and, as it must be raised to the level of railway trucks, a lot of filling would be required before the concrete floor could be laid down. The walls would be of brick, and the roof of iron.

117. *To Mr. Mathews.*—A considerable saving could be effected by lowering the walls of the vehicle stores about a foot or 18 inches. The current price of bricks in Sydney is 50s. at kiln, State Brickworks. The last quotation I heard for corrugated iron was £61, but the price varies a great deal. I do not think that sliding doors properly constructed would buckle under the influence of the sun; they would be hung from above, on an iron bar, and an occasional oiling of the wheels would prevent any stiffness.

118. *To Mr. Parker Moloney.*—The total cost of £60,613 for the Liverpool buildings actually completed or in course of erection includes also the cost of the railway siding. The plans for Seymour provide for stores bigger in area and more elaborately constructed. The Seymour stores are to be 300 x 100 feet, whilst those at Liverpool are 225 x 60 feet, and 228 x 80 feet respectively. The total floor space at Liverpool, when the four additional vehicle stores are completed, will be 199,220 square feet, as against the proposals for 210,000 square feet at Seymour. The fact that the Liverpool buildings are more numerous would mean more expensive construction. The total cost of our buildings, apart from the services, was £43,452, and for the caretaker's cottage, £610; making a grand total of £44,062. I understand that the stores at Seymour are estimated to cost £53,900. The caretaker's cottage at Liverpool has a living room, two bedrooms, and a kitchen. It is constructed of brick, and I understand that the dimensions of the rooms are the same as those for the proposed cottage at Seymour. The estimated cost at Seymour is £765, as against £610 at Liverpool; but it must be remembered that everything was in my favour at Liverpool. The bricks were obtained locally, and were first class. The cottage was built by day labour.

118a. *To the Chairman.*—I will let the Committee know the average cost of the galvanized iron used at Liverpool. Some of it was made in Australia, and the rest was imported from America. The latter was very unsatisfactory; it had been badly crated, and we had to pay 1d. per sheet to have it re-rolled. We are now using galvanized iron made in Australia by Lysaght. During the war it was impossible to get galvanized iron in Australia, and we imported some from America, some of which was used for the vehicle stores. The balance of the iron in those buildings was of Australian material, held in stock by either my Department or the State Constructor of Public Buildings. We do not supply the galvanized iron to the contractors in every case. For the ammunition magazines, the contractors will provide the iron.

119. *To Mr. Parker Moloney.*—None of the stores were built by day labour, except the foundations and floors of vehicle stores. These we did at a cost of £1,629. The buildings were then completed by the contractor.

Colonel Julius Henry Bruche, District Commandant, New South Wales, sworn and examined.

120. *To the Chairman.*—Having taken over the position of Commandant of New South Wales only four days ago, I regret that I have no knowledge of the conditions at Liverpool or of the stores which have been erected there. I have heard that in winter Liverpool is unsuitable for camping purposes on account of being very cold and wet. For a camp for the training of large bodies of soldiers one would naturally prefer undulating country, in order to secure good drainage and also for tactical purposes. It is desirable that equipment and vehicle stores should be contiguous to concentration camps, so that there may be a saving of time and labour in the issuing of stores. I think that arrangement would make for greater efficiency and despatch in mobilization. I have no knowledge of Broadmeadows as a camping ground, but I have attended schools of instruction at Seymour. Unfortunately, I am not qualified by first-hand knowledge to make a comparison between the two places in regard to their suitableness for concentration purposes. For stores one would naturally prefer brick buildings which would be cooler and less liable to fire risk, but wooden linings would considerably reduce the temperature of an iron building. I would not like to see ammunition magazines built too close to equipment stores, but it makes for speed and efficiency if all such buildings are within measurable distance of each other. If proper precautions are taken there is no danger in having the magazines in the same locality as the equipment stores. A railway siding is essential in connexion with such stores. I noticed that all the equipment and Ordnance stores in England were so constructed that railway trucks could run alongside them, and discharge direct into the sheds.

121. *To Mr. Mackay.*—Undulating land is preferable for a training camp. I consider that Seymour complies with most of our requirements. I attended an eight days' camp there on one occasion; we had the troops out every day on all sorts of operations, and the locality proved very suitable for military evolutions. The camp at that time was situated on the race-course. I have no knowledge of the present camp site, not having been there since 1910. Having worked with artillery, light horse, and infantry there, I think the contour of the country is most suitable for camping purposes. A flat area would probably be too wet and muddy in winter time; undulating country is preferable both for training purposes and for the health of the troops. Although Seymour is a good distance from Melbourne it is on the main railway line. For various reasons the camp ought not to be right alongside Melbourne. When I spoke of proper precautions being taken in connexion with the magazines, I had in mind the regulations which prescribe a certain temperature and other forms of protection. Ammunition stores in a brick building would be sufficiently protected against the risk of explosion so long as there was a guard or caretaker on the premises. It would not be sufficient to have an unguarded brick building standing on unenclosed ground; the area should be fenced in order to keep out intruders. I do not think that any earthworks will be necessary. A magazine should be a distance of about three-quarters of a mile from the equipment stores; that distance would not be too great for ammunition to be carried. The greater the distance the greater the safety, but the greater also the expense in carting and labour.

122. *To Mr. Mathews.*—At ordinary camps of training we start with platoon drill and then go on to company and brigade drill. Ultimately the various units are organized into divisions. At a mobilizaton camp there would not be much opportunity for individual training. For peace traning one requires a good drill ground, but such drill is only a minor consideration in comparison with tactical training. Men may be taught theoretically on the flat ground, but they must then be taken to undulating grounds in order that the principles may be applied under natural conditions. A brigadier would never personally handle his men in close order, except on ceremonial occasions or for assembly formation before the troops moved off the parade ground. A fairly large area of ground is required to parade a brigade which comprises from 3,000 to 4,000 men. For the handling of a division one would not necessarily require a flat manœuvring area. Of course, neither would one want rough and steep ground. Flemington race course is an ideal parade ground for ceremonial purposes, but for a mobilization camp a flat area of that kind is not necessary. All that is needed is sufficient flat area upon which to fall in the men preliminary to work, or for the issue of equipment and ammunition. In connexion with annual camps of training we must have a certain area of flat ground for the individual and elementary training.

PUBLIC WORKS COMMITTEE.

(Taken at Melbourne.)

WEDNESDAY, 19TH MAY, 1920.

Present:

Mr. GREGORY, Chairman;

Senator Needham,	Mr. Mackay,
Senator Newland,	Mr. Mathews
Mr. Atkinson,	Mr. Parker Moloney.

Major-General Sir Cyril Brudenell Bingham White, K.C.M.G., C.B., D.S.O., A.D.C., Deputy Chief of General Staff, Commonwealth Military Forces, sworn and examined.

123. *To the Chairman.*—I am aware that the proposed erection of Mobilization and Vehicle Stores at Seymour has been referred to your Committee for inquiry. In Australia, it is certainly a very great advantage to have the Mobilization Stores at the concentration places. It would be disadvantageous to have the Stores in Melbourne, and the concentration camp at Seymour. It is very essential that the Stores should have railway communication, and an effective water supply for concentration camps is also important from the point of view of sanitation. Speaking from memory, 10 gallons per man per day is regarded as a normal allowance covering most requirements. In connexion with an urgent demand we ought not to contemplate having in the concentration camp at Seymour less than 45,000 troops. Drainage is an important consideration, but during the war we were able in France to satisfactorily accommodate troops in many places where the drainage from an engineering point of view was defective. In selecting a site for a concentration camps, the questions of drainage and sanitation would be very carefully considered. Broadmeadows was established as a concentration camp in the early stages of the war, and considerable expenditure was incurred in connexion with it. There is a number of buildings at Broadmeadows, but the establishment of our concentration camp there was not part of any definite policy of mobilization before the war. It was a war expenditure. In the event of Seymour being the concentration camp of the future, in all probability the buildings now at Broadmeadows would be removed. It is impossible to say, at the moment, that we would entirely relinquish the Broadmeadows site. I am able to say that, in all probability, the buildings, at least, would be removed; but I cannot even say now that it is probable that the land would be given up. The question of area absolutely necessary for a concentration camp in Victoria involves a rather long discussion, and a recital of facts which it is important the Committee should know. In connexion with most armies, when troops are mobilized, the mobilization

stores -that is to say, the stores which are in excess of peace requirements but necessary for war requirements are kept at the head-quarters of the units. In almost every part of the world the peace equipment of an army is kept in one place, according to the allotment for each man, and the war stores are kept separately. In England, if an infantry unit goes from York to Salisbury, it takes over the mobilization stores of the unit that it relieves. In other words, the stores are identical, and an exchange is made. The origin of this system was the result of the Franco-Prussian War of 1870. France mobilized her troops in big centres, and in some cases had to bring down troops from the German frontier to the south of France, in order that they might be supplied with their mobilization equipment. That was a lesson to the armies of other countries, and military authorities agreed that thereafter the war equipment for every unit ought to be at the peace stations. That principle was adopted at Home, and *there can be no doubt that it is correct, so far as that* and many other countries are concerned. But picture for a moment the result of the application of the principle to Australian conditions. We have here—and rightly so, as the war has shown—a citizen army. If we had mobilization stores for each of our citizen force units as they now stand, those stores would be dotted mainly about our cities, and also over a few country districts. When those units were called up for home defence—and that is what we have to provide for—the process of mobilization would extend over at least two or three days. It is a rather involved operation. Picture the citizen force units coming in from all over the country to some such place as the Victoria Barracks, St. Kilda road, and being issued with expensive stores, including vehicles and the harness, and drawing the necessary horses from some remount establishment. What would be the result? I believe that the day after the issue we should find the greater part of the personal equipment in the second-hand boot and leather shops all over the city. This would occur without any ill-intention on the part of the soldiers themselves. A soldier once he is mobilized becomes somewhat careless. He gives way to a feeling of *abandon*, and the value of Government property is not seriously taken into account. When General Hutton went into this matter in 1904, he thought it would be well to establish what he spoke of as a grand magazine in one part of each State, and to have two or three expense magazines in other parts. That was very much after the old system of the French. When Major-General Bridges took over the control, he did his best to prosecute the scheme, but was unable to do so owing to the fact that we have never had in Australia a settled military policy. From time to time the policy has changed, and the soldiers had to do the best thing possible in the circumstances. After all, I do not think it is the fault of any one that we have not had a settled military policy. Before the great war we considered that we were more or less free from danger. The people had not become permeated with the principle of a citizen force, and were, therefore, not interested in learning the details of it, although it was really a matter of much concern to them. General Bridges was unable to carry out the scheme, and the matter was allowed to remain in abeyance. We adhered to the principle of having ordnance stores, but we had no mobilization stores. We had a large area of land at Liverpool, and erected there a certain number of excess ordnance stores which might be regarded as tantamount to mobilization stores, but the principle and the policy of having mobilization stores adjacent to our concentration camps was not adopted. When we returned from the war, the Minister for Defence assembled a conference of senior officers to consider this question. We carefully studied all the information available, and while we held that the principle adopted by France and other countries after the war of 1870 was a very wise one, we felt that it was hardly applicable to a citizen army in Australia. It was recognised that we had not a border over which an enemy might appear at any moment, and that Australia was bound to have some warning of attack. The very fact that we must necessarily have some little warning of attack enables us to vary the application of the principle. Leaving for the moment the question of mobilization stores, I should explain that as soon as troops were mobilized in Australia for home defence, it would be necessary to concentrate them somewhere near vital spots, in order that those spots might be protected. There are several such places. Two that are indisputably vital are Sydney and Melbourne. If either Sydney or Melbourne went, then there would be very little that Australia could do. It is all very well to cite the experience of the South African War, in connexion with which a guerilla campaign was *continued for two and a half years, but the* situation here is altogether different. The resources of the Transvaal were inland; whereas our iron, coal, and manufacturing resources are practically concentrated in and about Sydney and Melbourne. There can be no question, therefore, that Sydney and Melbourne are two very vital centres. It will thus be seen that it is necessary to concentrate troops at points where they will be readily available to protect those cities. If they were concentrated in the cities themselves, their whole freedom of action would be seriously curtailed. It is necessary to concentrate them outside these cities, but sufficiently near to them to enable them to be rapidly moved against any force which comes against the cities. Melbourne is rather favorably situated geographically, because troops located to the north of it could be easily moved to the only places where a landing could be effected. Then again, troops concentrated somewhere west of Sydney would be able to move readily to the points where an enemy might land. We took these facts into consideration. We knew that the troops would have to be concentrated somewhere, and recognised that it would be very inadvisable to try to mobilize citizen force units at home stations. We therefore asked ourselves whether it was possible to effect a compromise between the *place of mobilization* and the *place of concentration* in each State. As regards mobilization, it is most desirable that the mobilization stores should not be in the cities, but should be in some place convenient to them. For a number of reasons, it is essential that the stores should not be too far out. Stores have to be sent out to the mobilization places, and they have to be used during peace training. At the same time, the mobilization site must be sufficiently far away from the city as to render it impossible for it to be immersed in anything which takes place there. If either Melbourne or Sydney were captured, it would be highly desirable that we should be in a position to recapture it. We came to the conclusion that by a compromise it was possible to combine the place of mobilization, *i.e.*, the place where the troops would draw their war equipment, and the place of concentration, *i.e.*, where troops would be concentrated in time of war in each State. It was on that basis that we conducted our examination. Dealing first of all with Victoria, we found that Broadmeadows had already been *taken up for war* purposes, that certain buildings had been erected, and various facilities provided. But on going into the question of mobilizing at that place, we were confronted with the difficulty that only a limited area was available there. Looking a little to the future, it did not seem to us that it would be readily possible or advisable for the Government to purchase large additional areas. Moreover, if you accept my view of the impossibility of mobilizing at home centres

—if you recognise the desirableness of mobilizing somewhere outside the city, and yet not too far away—you will see that if Broadmeadows were selected, we should be confronted with what would be only an exaggeration of what would take place if we mobilized at unit headquarters. Shortly put, Broadmeadows is not far enough away from the city. We should have traders and vendors all about us, and it would be very difficult to control the troops. There would always be a certain number of men on leave. They would go into town, and there would be a great many cases of drunkenness. We therefore concluded that Broadmeadows was too near the city to be selected as a place of mobilization. What is more, if Melbourne fell, Broadmeadows would fall. The troops would not be free to manœuvre outside of it. We decided, therefore, that it was necessary to go further out. Our first selection was Kilmore, which is certainly the most suitable from a strategical point of view. We found, however, that if Kilmore was selected, all the land required for the purpose would *have to be resumed, and some of the land* in that district is of high value. On the other hand, the Department had taken over some land at Seymour for other purposes, and after an inspection of both sites, it was decided that the additional distance as between Kilmore and Seymour was not so great as to make it necessary to fix upon Kilmore, and so to call upon the Government to resume land there. If this principle be adopted by the Government—and it is now before the Cabinet—there is yet another advantage to be derived from it. Our citizen troops have to go into camp annually. They go wherever we can obtain the necessary land. Sometimes they go into camp at one place, and sometimes at another, and they take with them only such stores as are necessary for training purposes. These may be described as the three-quarter way between peace stores and war stores. If you regard peace stores as being one-half of what the units possess, and war stores as the whole, you have probably an issue of one-fourth of the war stores for your training requirements. We thought that if the place of mobilization and of concentration were one and the same in each district, it would be advantageous also *to adopt that place for annual training* purposes. It would be near our mobilization stores and convenient for the issue of the extra stores necessary for such training camps. It would enable us also to withdraw from the units themselves a portion of the peace equipment they now possess, and thus reduce the quantity issued to the units in peace time. That would be a great advantage. Unit deficiencies are one of our annual bug-bears. Even the very best officers and non-commissioned officers in a Citizen Force are hard pressed to keep careful control of all stores issued. If you have, say, 600 men, and issue them with shirts, hats, and other articles, it is extremely difficult to have the whole of that issue carefully checked. The less one issues in time of peace the less one's annual deficiency will be. For these reasons, and for the further reasons that the place of concentration in time of war would be better if fitted with hutting and other facilities, and that concentration camps could be applied to the purposes of annual training, and thus result in considerable saving, we decided that the places of mobilization, concentration, and training should be one and the same. We recommended to the Government that *all training should be effected annually at* such places of mobilization and concentration. The Committee may take it that the Defence Department has practically approved definitely of the selection of Seymour as the concentration camp for Victoria. We have over 100,000 acres of land at Liverpool, but it will not be necessary for us to resume anything like that area at Seymour. If we can increase the present area by a couple of thousand acres so as to enable the annual training to be carried out, so much the better. One of the lessons of the recent war is that it is not necessary to have vast areas for training purposes A certain amount of manœuvre, marching, and so on can be carried out on land that has not been resumed or purchased by the Government. The area actually necessary to be resumed or purchased is not very great. It is not likely that we shall be training except in time of war the total of 45,000 troops which I mentioned earlier in my evidence. The number that is likely to be in training at Seymour annually depends upon the policy that will be adopted by the Government as to the number of men to be put through, and the duration of their training. Under our universal training scheme we get about 16,000 men annually throughout Australia. They are liable for seven years, and, therefore, at the end of the seven years' period we should have throughout Australia about 112,000 troops. Victoria's proportion of that total might amount to some 30,000 troops. So far as I can judge from present *conditions, I do not think* it likely that 30,000 troops will be training at Seymour for some time to come. The area of land necessary for the training of a division, which is, roughly, 20,000, should be secured in addition to the area occupied by mobilization stores, railway facilities, and roads. It would not require to be very much more than 2,000 acres. I think we should be able to do very well with such an area. My recollection of the land at Seymour is that it is quite suitable for a limited amount of training. I think we have there 785 acres. That is rather on the small side, but our inquiries led us to the conclusion that the cost of resuming land in the district would not be very great. The railway system of Victoria lends itself to the making of a fairly ideal concentration camp at Seymour, and the information at our disposal goes to show that the water supply would be ample. I visited Seymour this year. I have not been at Seymour during the winter months. I visited the site this year after a particularly dry season, but I think that from the point of view of soil the site is quite suitable for our purposes. There can be no question that if the cost is not prohibitive, a sewerage system would be most desirable. We can, however, with proper discipline and medical supervision, make the pan system quite hygienic. I have seen plans showing the type of stores proposed to be erected, and I know that it has been recommended that the stores should be constructed of galvanized iron. That matter is somewhat outside of my province, but I should be glad to go into it. As to whether it would be better to construct them with concrete or brick, I think that with a contemplated life of thirty or forty years, galvanized iron buildings should be sufficient for our purpose. It will be the policy of the Department to provide a properly organized system of *caretakers, and the danger of the stores* being broken into can be guarded against. It is true that the stores are to be erected within a mile of the town of Seymour, but I do not think that we shall run any undue risk by building them of galvanized iron. In a young country like this, we cannot look too far ahead. We do not know what developments may take place; but, at the same time, we should not adopt a short-sighted policy. A large quantity of the stores to be housed are coming from the Old Country. A long discussion took place on the question as to whether it would not be possible to sell a quantity of these stores. The matter was gone into very carefully with the object of ascertaining what stores we could dispense with. It was thought that we might sell some of them, and with the money so obtained make purchases out here. I am not prepared to say that had that course been followed it would have been easy to make use of the savings contemplated. Apart from the stores that we took away with us, we obtained all our issues from the

Home Government on payment, and we paid them so much per day for maintenance. To put the position clearly to you, if the Home Government issued me a certain article of equipment the cost of it was debited to the Commonwealth; but if, on the following day, I lost that article, and drew another, no charge was made for it. The new issue was covered by the daily maintenance charge. The Home Government treated us very fairly, supplying us with these stores at a very low daily rate per capita. When I left England in April of last year it was almost impossible to obtain from the War Office an exact statement as to how we stood. All the accounts had not been made up. The War Office was not like a well-organized firm, which could give you your account the moment you ceased your business transactions with it. When the proposal was made that, instead of bringing out so many of these vehicles and other equipment, we should take cash for them, the War Office said to us, "We cannot take over that material and give you our book debit as a credit. But we will dispose of it for you at various disposal centres." We made inquiries as to what was likely to be the result of sales at these disposal centres. We found that the results varied. If, for instance, blankets were sold, the prices obtained were excellent. On the other hand, some of the vehicles were selling for little or nothing. Finally, after going into the question of freight, and considering the whole position, the Government decided that, save in regard to some blankets and perishable stores, we should bring out the whole of our equipment. It would not have been possible to sell on such advantageous terms as would warrant our disposing of these things at Home. We are not having goods manufactured to make up any deficiency.

124. *To Mr. Mathews.*—The new spades and other things which the Committee saw at Liverpool were doubtless supplied under contracts which had been entered into on the possibility of the war continuing longer than it did. I cannot say that I know the Seymour Camp very well. I have visited it, but have not stayed there. At the concentration camps there would be a good deal of disciplinary and military training. The lesson of the war is that we should train, first of all, the individual man in the use of the individual weapon that he has to handle. Next we train the men, in the case of infantry, in platoons, then in companies, and finally in battalions. It will not be really necessary to carry out the ceremonial training of men in brigades. That class of training has practically gone. If we were to have a review in Melbourne now and again, very little time would be spent in preparing for it in these camps of training. The area available at Seymour should be sufficient for most training purposes. It is quite correct that the only one bit of flat country in the Seymour area is covered by sleeping sheds. Seymour is a very suitable place for training purposes. It does not provide a large area for ceremonial training; but that I do not regard as important. My recollection of the surface of the soil is that it is fairly satisfactory. We do not require a great deal of flat country to carry on what may be spoken of as barrack-square drill. I have not looked into detailed information as to the water supply of Seymour. Plans relating to the matter were brought to me, but, as you know, my time has been occupied recently with another duty, and I have only been able to make a cursory examination of them. I cannot say how far the authorities have gone into the question of the suitability of the water supply to be drawn from the Goulburn there. The river I know passes through inhabited country, and while the water supply drawn from it may now be quite suitable, it might be wholly unsuitable later on. I shall take a note of that phase of the question and look into it. There will be a gradual turnover of the goods in the mobilization stores. As the peace equipment wears out, it will be replenished from the war equipment, and the war equipment will be replaced in turn by new supplies. Your suggestion that it might be better for the proposed branch railway line to leave the main line south instead of north of the Seymour station is worth looking into. The Quartermaster-General is dealing with the railway plans, but I shall certainly look into the question of whether it would not be better for the branch line to break off south of the town. I think it would be advantageous.

125. *To Senator Newland.*—In the event of an attack on Melbourne, we should have only the one double line by which to bring troops from Seymour to the city. The position is the same in a good many places. In a young country like this, naturally the railway development is not what we should like it to be. In time of war we should have at once to put down another line. The position would be the same at Kilmore and other places. The advantage of having troops concentrated at a place like Seymour—some distance from the metropolis—is that if they were within easy marching distance they might be enveloped by any envelopment that overtook the city itself. It would be a great advantage to have more than one line in time of war connecting us with the city. On the outbreak of war we would begin at once to lay down another line. As a matter of fact, we want a line branching out from Seymour in another direction where we might need to send troops. I have spoken to the responsible officers in regard to the proposal to leave one side of the vehicle sheds open. I do not like the idea. It is all very well to say that the opening is not to be on the weather side; but my experience of Victoria is that we may get weather from any quarter. In any case, the risk involved is greater than the saving to be effected by not closing in the sheds on every side. It would be much better to have all sides enclosed. The proposal to leave one side open is prompted by motives of economy; but I do not favour it. The proposal to have an open bay and a closed bay alternately is not likely to occasion any serious inconvenience. It might mean that we should be able to store in the space opposite a closed bay one vehicle less than could be stored opposite an open bay.

126. *To the Chairman.*—If one side of the shed were left open there might be a danger of the opposite side being blown out, in the event of a storm.

127. *To Senator Newland.*—Having regard also to the damage that might be done to the vehicles as the result of dampness, and so forth, I think it is highly desirable that all sides of the vehicle sheds should be enclosed. My experience is that a great deal of deterioration goes on in the case of vehicles stored in country sheds owing to the sides being unprotected. We often see in country districts a vehicle shed consisting of only a roof. The roof protects the vehicles from the rays of the sun, but they suffer greatly from being only partially closed in. Well-constructed sliding doors are advantageous, but a badly constructed sliding door is very troublesome. As to the height of the doors, we shall have motor lorries and ambulances, which have covers, going into these sheds; but all the other vehicles would not necessitate high doors. It would be sufficient to provide at one end of the shed for the ambulances and motor lorries. If the buildings are to be enclosed on all sides, it would be a disadvantage to have very high doors, as they would be likely to get out of order. The great majority of our vehicles are not of any height.

128. *To Mr. Mackay.*—A proportion of the equipment which is coming from the Old Country will be sent to each State. Something is being done, I think, in Queensland, and also in Western Australia, to provide for its housing. Speaking off-hand, I should think that the erection of five vehicle sheds and two equipment stores at Seymour will not be anything like sufficient to provide for the equipment which we shall have here. A good deal more space will be required. It seems to me that the floor space provided for in the plans before the Committee is on the small side. The Quartermaster-General, General Forsyth, should be able to give you definite information on the subject. According to cabled advice from London, the cubical storage requirements for equipment to be shipped to Melbourne is (for general stores) 480,000 cubic feet. In addition, 120,000 square feet of covered space will be required for vehicles coming to Melbourne from overseas, and approximately 30,000 square feet for housing vehicles already in Victoria. It is proposed to erect stores of similar pattern in Queensland, South Australia, Western Australia, and Tasmania. The work is in progress in Queensland. The continuation of the railway line right into the camp at Seymour has not, to my knowledge, been considered. There is just a little difficulty in securing approval to the whole military policy. Until we have the approval of the Government, we cannot go into that proposal. It would be desirable to have such a continuation. I shall make a note of the matter.

129. *To Mr. Parker Moloney.*—Of the three suggested sites—Broadmeadows, Seymour, and Kilmore—Broadmeadows is unquestionably the least suitable. The chief objection to it is that it is too close to the city for mobilization and concentration purposes, in that the troops would be overrun when the city itself was overrun by an enemy. Seymour, on the other hand, certainly goes to the extreme limit, but not beyond it. I should have preferred Kilmore, because, as regards the requirements of concentration and mobilization, it is a better compromise in distance from Melbourne than is Seymour. The difference between the two, however, is not so great as to warrant our selecting Kilmore, where we should have to purchase land, as against Seymour, where we already have a considerable area. Kilmore is excluded because of considerations of cost. The advantages of Kilmore for these purposes are that it is sufficiently far out of the city to rid us of the difficulty that would attach to the selection of Broadmeadows, and that, from the point of view of concentration, it is a little nearer Melbourne than is Seymour; so that it would be easier to move the troops down to the points where we should want them. It is also at the junction of certain lines of railway which, in time of war, could be suitably developed. We might have to send troops to South Australia or New South Wales, and in that case Kilmore would be the most suitable site. It would also lend itself to the construction of other lines that we should have to build in certain directions in time of war. Seymour, however, is not much further away. If we go on with our annual training camps, we must in time muster 20,000 men at Seymour; and to provide for that number we shall require at least another 2,000 acres. In France, and even in Egypt, we were able to train a division where we could get a couple of thousand acres free of obstacles. I anticipate that a good deal of the area now held by the Department will be required for the stores and railway purposes, and that we shall want at least 2,000 acres in addition, in order to be able to train 20,000 men at the one time. That, in time to come, is likely to be the minimum annually in camp. In war time, we should need a great deal more land; but we should have no difficulty in that regard, because we could train our men over private land. The people, in such circumstances, would be very glad to let us use their land for that purpose; but so far as our annual training is concerned, we do not desire to irritate our citizens by having to occupy their land. You ask why, if the area at Seymour was sufficient for training purposes in connexion with the last war, it should not be sufficient now. As a matter of fact, at no time during the war did we have anything like 20,000 troops at Seymour. I do not think that we had more than 4,000 there at any given time. In acquiring the additional 2,000 acres, we might be able to remedy the defect to which Mr. Mathews has alluded by obtaining a little more flat country, although I do not think that that is a vital consideration.

130. *To Senator Newland.*—It is a very common practice in storing waggons and ammunition carts to remove the wheels. In that way the space required is considerably reduced. I think the Quartermaster-General contemplates storing the vehicles in that way. It is by no means an unusual procedure at mobilization stores.

(Taken at Melbourne.)

TUESDAY, 25TH MAY, 1920.

Present:

Mr. GREGORY, Chairman;

Senator Needham,	Mr. Bamford,
Senator Newland,	Mr. Mathews.
Mr. Atkinson,	

Colonel Thomas Murdoch, Director of Works, Defence Department, sworn and examined.

131. *To the Chairman.*—I have been to the Liverpool Camp, and have seen the class of buildings which have been erected there. The plans which have been prepared in connexion with the proposed stores at Seymour provide for larger buildings than those at Liverpool, and the area will be less obstructed by posts. The plans submitted by the Department of Works and Railways have practically satisfied me in all details. I selected the site for the proposed stores at Seymour, and, with a view to their economic construction, I think it would be wise to have a railway laid down to that site as soon as possible. It is essential that a siding should be put in, though that is rather a matter for the Quartermaster-General. At Liverpool, in connexion with the Equipment Stores, there is a space of 3 ft. 6 in. or 4 feet between the ground and the floor level. To prevent rubbish collecting it might, perhaps, be well to enclose that space. It is proposed to fence the reserve by an obstruction barbed-wire fence. Of course, it is not possible to erect a fence which people cannot get through. But all that is necessary in this case is to erect a fence which will enable any person approaching it to understand that he is not wanted inside. I do not think that the risk of fire will be added to by leaving a space between the ground and the floor of the proposed buildings at Seymour. At ordinary times, there will simply be a night watchman employed at the stores. From the stand-point of ventilation, I do not think anything is to be gained by leaving the space open. It is quite possible that the equipment stored in the equipment building will remain there for many years. A galvanized iron building with iron walls will afford ample protection to the goods which will be stored therein. I would have preferred a brick building, but that would be expensive at Seymour. I have not considered the question of erecting the buildings in concrete. I have depended entirely upon the Department of Works and Railways to determine which is the cheapest form of construction. Haste is essential, because I understand

that some of the equipment to be stored in the buildings is already on the water. In connexion with the roofing of the equipment stores, I am quite satisfied that the class of building projected is as economic as is possible. I was not of that opinion in the first instance. I thought then that we could use all steel. But when I went into the matter with the Department of Works and Railways I became thoroughly convinced that the class of construction proposed is the cheaper. I have not seen the "Gawco" system of roofing in Australia, but I have seen similar types of roofing in England. I cannot say what is the cost of it, nor can I speak of its suitability or otherwise. The walls of the vehicle sheds at Seymour will be 11 feet high. I have not been to Liverpool recently since military stores have been housed there. But it is not intended that in the buildings there anything shall be stored on top of the gun carriages. With 11-foot walls in the buildings at Seymour there will be some vacant space, but all vehicles are not as low as gun carriages. For instance, the bulk of the waggons stored at Liverpool are G.S. waggons, which have a height of about 7 feet. There is not very much economy to be gained by cutting down the height of the walls. I am not sure how the Quartermaster-General intends to store gun carriages in the proposed buildings at Seymour. I understand that there will be a certain proportion of gun carriages and ammunition waggons in each shed. It would not be advisable to store all the gun carriages in one shed. The plans provide that the vehicle sheds shall be open at one side. That will insure better ventilation. The open side will face to the east, which at Seymour is the leeward side. To install doors would afford no protection from the weather, whilst it would make the ventilation slightly less efficient. There will be no danger of a wind storm blowing the buildings away. The main storms there do not come from the east, and, in addition, the structures will be sufficiently strong to withstand them. I do not know anything about a storm having blown out one of the ends of a building at Liverpool. Perhaps winds from the north are experienced there. I am quite prepared to affirm that if one side of the vehicle sheds be left open, there will be no danger of the whole shed being blown away. I do not think there would be much greater protection from weather, moisture, and dust if the sheds in which it is proposed to store the vehicles were enclosed. If they were enclosed I would recommend an alteration from the style of doorways that has been adopted at Liverpool. There the doors are certainly not strong, and they are too high and too wide. They were put in whilst I was away. In my opinion, the whole of the front of the building should be capable of being opened, otherwise we shall lose a certain amount of space, and it must be remembered that, in time of mobilization, the principal object to be achieved is that of getting the vehicles out of the stores with all possible speed. I think that every portion of the building should be capable of being opened by a series of doors. Hinged doors properly designed should be quite sufficient. Nine feet would be ample for their width, and one door at each end over 8 feet high would be quite sufficient.

132. *To Senator Needham.*—Whether it is proposed to build all the mobilization and vehicle stores at Seymour, or whether it is intended to put some of them together in Melbourne and transport them to Seymour, I cannot say. That is a matter which has to be determined by the Department of Works and Railways. Personally, I would prefer to see all of them built at Seymour. The method of their erection is a matter exclusively under the control of the Department I have mentioned. Of course, the type of the buildings is settled by the Defence Department. From the stand-point of insurance, I do not think it would be wise to have doors on the eastern side of the vehicle sheds. I would probably hold that opinion even more strongly if the goods stored therein were my personal property. I cannot say what would be the difference between the cost of putting in, and of not putting in, doors. I will, however, undertake to supply the Committee with an estimate of the cost of installing hinged doors as against sliding doors.

133. *To Mr. Atkinson.*—When I selected the site at Seymour, I had a good look round the neighbourhood with a view to choosing the best possible site. The site chosen is the best building site within a reasonable distance of Seymour station. I do not think any difficulty will be experienced in taking a railway siding to the site, which is practically adjacent to the Seymour Camp. It is distant from that camp by only a couple of miles at the most, and if we can get stores as close to a camp as that we are doing very well. In time of mobilization the camp would probably extend to the stores. I am satisfied that the suggested scheme for supplying water to the site is the best obtainable.

134. *To Mr. Mathews.*—In my official capacity I have had to undertake work connected with both Seymour and Broadmeadows Camps. I cannot very well tell the Committee the salient points which determined the selection between the two camps. I think that General White gave evidence upon that matter. What actually determined the authorities to choose Seymour in preference to Broameadows were strategical considerations. As a camp site, Seymour is a long way ahead of Broadmeadows. Its water supply is better, the soil is better, and the facilities for military training are also better. The ground at Broadmeadows is not suitable for a camp. When the Australian Imperial Force camp was there in 1915, it was upon my recommendation that the troops were removed to Seymour. At that time the Broadmeadows camp was in a shocking condition. The men were actually lying in mud. It was impossible to keep it out of their tents. I do not think very much training could be done on that ground. Very keen north winds were also experienced there, and altogether it was essential that the camp should be removed to Seymour. The fence which will surround the proposed buildings at Seymour will not be easy to get through, and there will be droppers between the posts. Since the camp was closed at Broadmeadows I have not noticed many trespassers there, and there has been no report as to trespassers. Three attendants are employed there. A certain quantity of stores are stored there, but none of these is of a character that would attract an ordinary pilferer. At Seymour I think the fence and the buildings to be provided will be sufficient protection against ordinary pilferers. Of course, if a thief is determined to get into a building he can do so. We cannot make it burglar proof. I have already said that for the sake of economy and efficiency, I would like to see one side of the buildings open. At Seymour very little rain will beat in those buildings from the east. The walls of the structures could be lowered, say, 18 inches, if any great saving would be thus effected, but I do not think that there would be.

135. *To Senator Newland.*—Assuming that the figures given by the Department of Works and Railways are correct—and I have no reason to doubt them—the method of construction of the proposed buildings meets with my entire approval. I have accepted the cost submitted by that Department without checking it. That cost seems fairly reasonable. Seeing that 190,000 square feet of space were provided at Liverpool at a cost of £43,000, whereas 200,000 square feet of space at Seymour is estimated to cost £55,000, I fail to understand the reason for the increase unless

it be that iron is now at a higher price than it was. In England it is the practice to leave all sides of vehicle stores entirely open. Those vehicles would be handled more frequently in the Old Country than they will be here. In Seymour the chances are that a vehicle will remain in the same position for possibly six months at a time. With an open door it will thus be exposed to the elements for half a year without a change. That, however, will not have the effect of depreciating its value, because at Seymour the buildings will face east, and very little bad weather is experienced from that quarter. There will be sufficient overhanging eaves to prevent anything but the early morning sun getting upon the vehicles, whilst upon the other three sides the buildings will be protected from the afternoon sun and heavy winds. The benefit to be gained by closing in the entire vehicle sheds would not compensate for the cost of the doors that would have to be provided. I do not think it would be a good idea to have the sheds built further back from the roadway. The ground dips for some considerable distance into a corner, and it is necessary to have a fair space between the two sheds. In the event of mobilization, the vehicles would need to be taken from the vehicle sheds to the equipment store to load them there. There is quite sufficient space—100 feet—in front of each of the proposed sheds. I am satisfied with the construction of the stores apart from the vehicle and mobilization sheds. There is bound to be a danger of fire in any store such as those of which I am now speaking. That danger can be overcome only by efficient watching, and by regulations for the prevention of smoking, &c. I would not recommend the installation of sprinklers as a precaution against fire. I think the employment of two night watchmen at these buildings would be sufficient. It would not be necessary to have special watchmen in the day time. If an outbreak of war occurred, and there were an enemy sympathizer in the neighbourhood, the system of watching which I have suggested would not be sufficient. But the moment there appeared to be a likelihood of war, a guard would be placed in charge of the building. I do not think it necessary to enclose the space under the floor of the buildings to prevent rubbish accumulating there. I imagine that we can prevent that by the issue of instructions to the effect that rubbish must not be allowed to accumulate there. The trouble, I think, may be obviated by careful watching. Buildings erected upon the site at Seymour will not be so likely to be attacked by white ants as are buildings at Liverpool. The protection against white ants at the latter place is not sufficient. All the stumps at Liverpool should be capped. At Seymour it will not be necessary to set the whole of the stumps in concrete. Tarring and charring them will be quite sufficient. The stumps will last quite as long as will the buildings.

136. *To the Chairman.*—Eventually, I think that we shall require to build at Seymour three more vehicle stores and three more ammunition stores. That course, however, has not been decided upon.

137. *To Mr. Atkinson.*—All the equipment stores shown on the plans are not to be built immediately. I do not think that the extra equipment stores will ever be required.

138. *To the Chairman.*—In the light of General Forsyth's statement that for general stores the accommodation required for equipment is 480,000 cubic feet, two stores stacked 8 feet high will provide ample accommodation for equipment purposes. The last information I had from him was that 208,000 square feet of space would be required to accommodate the vehicles. I have been consulted in connexion with the erection of certain stores in Queensland, but off-hand I cannot say what will be their approximate cost. I believe that it will be in the neighbourhood of £18,000. At Seymour it would be wise, perhaps, to provide one room in which the employees at these buildings could light a fire and boil their billies. Their requirements, at the present time nobody can say, but the matter will not be overlooked. I believe that there is an Australian firm in Sydney which is manufacturing a sanitary system upon similar lines to that adopted in connexion with the "Kaustine" process.

139. *To Mr. Bamford.* In my opinion it would be wise to use 6 inch x 6 inch upright posts. I do not recommend that all sides of the gun carriage stores should be open. If the space between the platform in the equipment stores and the ground were enclosed with barbed wire that would not prevent rubbish being thrown there. It would be very awkward to take care of anything which might be stacked on top of gun carriages. At Liverpool it would be advisable to use either brick or concrete piers, but that is not necessary at Seymour. At the latter place, I think that 4 inch x 4 inch stumps with sole pieces should be used. I have not seen the "Gawco" system in use here, but I will make it my business to do so, and will report to the Committee my views as to its suitability or otherwise in connexion with the proposed buildings at Seymour.

140. *To Senator Needham.*—Whether any material which is at present at Broadmeadows can be used for the erection of buildings at Seymour, will depend upon the official decision as to whether the Broadmeadows Camp is to be closed. My own opinion is that the buildings at Broadmeadows should be shifted to Seymour. I think that about £10 per acre is about a fair valuation for the acquisition of the Seymour site. I do not anticipate any difficulty will be experienced in securing the necessary hardwood for the proposed buildings, but we may have to wait a little time for it.

The witness withdrew.

Edward Henry Ballard, Chief Engineer of Ways and Works, Victorian Railways Department, sworn and examined.

141. *To the Chairman.* The proposal to lay down a railway siding from the northern end of the Seymour station to the site of the proposed mobilization and vehicle stores has been submitted to me for report. I produce a plan showing the proposed siding accommodation to be provided for the Defence Department. The said plan has been prepared as a result of several interviews which I had with Colonel Owen, Mr. Hill, and Mr. Murdoch. From a railway stand-point, it is quite a sound proposition. At first we entertained some little doubt upon the matter, owing to the congestion at Seymour, but the Railways Commissioners have considered the scheme, and have agreed to it. When I say that the proposed siding is quite satisfactory from a railway stand-point, I assume that the goods or material that will pass over it will be brought in in train loads, and not in small truck loads. I have not considered whether the line could be extended to the Seymour Camp. But I know the country well, and I do not think any difficulty will be experienced in continuing the siding to the camp, although I would not like to commit myself definitely to that assertion. I have here a statement showing the conditions under which the Railway Department of Victoria is prepared to construct, maintain, and operate the proposed siding. It reads –

The estimated cost of providing siding accommodation for the Defence Department at Seymour, as shown in red colour

on plan dated 11th May, 1920, is £8,560. A detail plan 40 feet to 1 inch, showing the junction work, is also attached.

If the Commissioners approve, this private siding might be provided for the Commonwealth of Australia (Department of Defence) on condition—

1. That the Commonwealth will pay in advance the estimated cost, viz, £8,560, and agree—

(a) to pay the actual cost then ascertained should the estimate be exceeded;

(b) to pay in advance an annual maintenance charge of equivalent to 1 per cent. of the cost of the completed siding above sub-grade which is estimated will amount to £251, and which does not include chipping or burning off on each side of the siding.

2. That all traffic to, from, and at this private siding, shall be subject to the by-laws and regulations of the Commissioners, and that this private siding shall be open for goods in truck loads only consigned to or by the Defence Department of the Commonwealth.

3. That trucks will be placed on and/or removed from this private siding at such times and on such days as may be convenient to the Commissioners, provided that they shall not be under any obligation to remove from this private siding any trucks not fully and properly loaded, and when necessary covered and lashed to the satisfaction of the proper officer of the Commissioners.

4. That the Commonwealth will pay a charge of 7s. 6d. for every fifteen minutes or part thereof that an engine of the Commissioners is employed on this private siding, the time being computed from when the engine leaves Seymour station until its return thereto.

5. That freight charges shall be calculated on the mileage to and or from the terminus of the private siding.

6. That the Commonwealth will not use on this private siding any steam crane or locomotive.

7. That the Commonwealth will obtain sufficient authority to the satisfaction of the State Crown Solicitor for the Commissioners to construct this private siding, and to conduct traffic thereon, including the crossing of roads, and will also obtain the consent of the local municipality to the alteration to the grade of the road approach to the main line.

8. That any and all buildings, platforms, and other structures proposed to be erected contiguous to the lines of way shall be erected and maintained by the Commonwealth to the satisfaction of the proper officer of the Commissioners, particular care being taken to see that the standard clearances of this Department are strictly observed.

9. That the Commonwealth shall, at its own expense, acquire all land required for the construction of the siding as shown on attached plan, and, if it be found necessary, that the Commonwealth shall at its own cost acquire any additional land necessary for the diversion of roads, streets, and drains, and for any other purpose.

10. That the Commonwealth shall bear the cost and maintenance thereof of any accommodation works that it may arrange with land owners in the settlement of the land compensation for the land required for the siding.

11 That the Commonwealth will indemnify the Commissioners from all losses, expenses, and injuries, and also from all actions, suits, claims, and demands, which any person or persons, body or bodies can, shall, or might have against the Commissioners for any injury to such person or persons, body or bodies, in consequence of the construction of this private siding, and/or the operation of traffic thereon, whether the injuries, damages, or losses referred to be caused by or be incidental to fire or sparks arising on or communicated from the property or premises of the Commissioners, or communicated from any locomotive, engine, or truck the property of the Commissioners or otherwise.

12. That the Commonwealth will, when required by the Commissioners, execute the standard private siding working agreement (a blank copy of which is attached), which will be prepared by the State Crown Solicitor at the expense of the Commonwealth, and which will embody the foregoing and such other conditions as are usually imposed in respect of the provision and working of private sidings, including a provision that the terms shall be for one year from a date to be fixed, subject after the expiration of one year from the date fixed to determination by either side giving to the other three months' notice, in writing, and in the event of the Commissioners giving such notice to the payment of no compensation for the removal of the siding.

On receipt of acceptance of the conditions, together with a cheque for the estimated cost of the siding and when materials become available, the work will be commenced.

112. *To Mr. Bamford.*—Those conditions are the conditions which are imposed in the case of every private siding.

113. *To the Chairman.*—The estimated cost of the siding, exclusive of the land, is £8,560. The route mileage is 72 chains 30 links, and the track mileage 1 mile 41 chains and 5 links, which is equivalent to 1.51 miles. The estimated cost is made up of £4,362 for labour, and £4,297 for material. The rails to be provided for are 60 lbs. serviceable second-hand rails, at £9 per ton. New rails, if they could be procured, would cost £15 to £16 per ton. The rails, fish-plates, fish bolts, and dog spikes are estimated at the cost of serviceable material. The sleepers and crossing timbers would, of course, consist of new material. From a railway stand-point, except that the cost would be considerably increased, I can see no objection to a proposal to push the line north some 40 feet at the point where it will enter the reserve, so as to preserve the same space between the equipment and the vehicle sheds, whilst enabling those buildings to be placed a little farther back from the road line. I would point out that I have had nothing whatever to do with the location of the line or with the level at which it should be constructed at the site of the stores. That was fixed by Colonel Owen, who gave me a plan to work from. The excavation which will be required for the railway line will involve an average depth of cutting of 4 feet throughout, and that fact explains largely the cost which will be involved. The earthworks will mean the excavation of 10,000 cubic yards, which, at 4s. per yard, will cost £2,120. I propose to utilize 8,500 yards of that material, leaving a surplus of 2,100 cubic yards, which I would either run to spoil, or use to widen out the embankments in view of possible duplication, or dispose of as might be required by the Defence authorities. The distance between Melbourne and Seymour is 61½ miles, and from the end of the proposed siding 62¾ miles. I now hand in for the information of the Committee a statement showing the freight charges that will apply to the siding.

114. *To Mr. Bamford.*—The Defence Department covered, in writing, every arrangement made between Colonel Owen and myself, and submitted the proposals as formal requests to the Railways Commissioners. I have had a special inspection made of the route which will be traversed by the projected siding, and I have estimated the cost of the earthworks at 4s. per cubic yard. I informed Colonel Owen that the Railway Department does not desire to carry out the earthworks, but in a further letter received from him by the Railways Commissioners, he expressly asked us to base our estimate upon the assumption that we would undertake them.

115. *To Mr. Mathews.*—If it were necessary to get the siding in expeditiously we might possibly run trains over it before it was actually completed. To complete it, the time required would be ten weeks, assuming that I could get the rails and material. The work below sub-grade would occupy eight weeks, and that above sub-grade two weeks. Upon the other hand, if rails were not available—and they are not at present—the work below sub-grade would take eight weeks to build, and the track work would occupy four weeks after the material came to hand. At present we have no rails here at all. Some thousands of tons have been rolled at Newcastle, and have been ready for despatch here for months, but the necessary shipping has not been available. I could get sleepers. Seymour is an important railway depôt. In time of mobilization the transport of goods for the Commonwealth would seriously interfere with our ordinary traffic, but the exigencies of the Commonwealth requirements would be paramount. We would have to submit to that interference. If the Commonwealth wanted to run eight or ten trains per day backwards and forwards for a long period, obviously that would upset our normal arrangements. To junction the proposed sidings with the main line at some point before reaching Seymour would not constitute an improvement. If the site selected for these stores is either at or near Seymour, I cannot suggest any better take-off than that now proposed.

116. *To Senator Newland.*—It is not intended that tenders shall be called for the work in a general way, but tenders would be invited for the supply of scoops and drays, and these would be employed at so much per day. We have no objection whatever to the Defence Department making its own arrangements in respect of the earthworks. Our portion of the undertaking would be carried out under the day labour system. Under the form adopted by the Railway Department in connexion with private sidings, in the event of the work costing more than £8,560, the Commonwealth would have to pay the balance. Should the undertaking cost less than the estimate, the Commonwealth would get the benefit. We use 60-lb. rails upon sidings which are traversed by any class of locomotives.

116A. *To Mr. Atkinson.*—My estimate of £8,560 as the cost of the line has not been submitted to the Commonwealth authorities. I have not had time to do that. We were definitely asked to undertake the excavation of the earthworks upon the siding in a letter from the Secretary of the Department of Works and Railways dated 24th April last. What the siding would cost if it were located 50 feet north of the line shown on the plan would depend entirely upon the level fixed by the Defence Department as the rail level at their stores. If they fixed their formation level at anything like surface level, the cost of the project would be less than I have indicated.

117. *To the Chairman.*—The length of railway between the points of the loop sidings to serve the proposed stores is approximately 48 chains. There would thus be over 20 chains of three sets of rails serving the stores. The loop sidings could, of course, be shortened to reduce the loop frontage of the stores, and there would be no difficulty in extending the sidings if that were necessary in the future.
necessary in the future.

118. *To Senator Newland.*—I cannot say offhand what length of siding would be required to accommodate a full train, but I will supply that information this afternoon. The sidings shown on the plan would take a full train load. The length of the siding as planned has been arranged to suit the length of the stores outlined by Colonel Owen.

The witness withdrew.

Percy Thomas Owen, Director-General of Works, recalled and further examined.

119. *To the Chairman.*—I understand that Mr. Ballard, Chief Engineer of Ways and Works, Victorian Railways Department, has submitted to the Committee a plan and sections for a triple railway siding at a total cost of £8,560. That plan was drawn to provide for three equipment stores that are projected, but I am not prepared to say that the length of siding could be reduced in view of the fact that only two of the buildings are to be put in hand at once. The length of siding must be governed to some extent by the number of trucks to be handled. I will not say that the Department could not do with a shorter length of siding until the third building is constructed, but if the stores are brought in in large quantities, the Railway Department will require to handle big trains. In view of the number of trucks that will require to be handled, I do not think it would be advisable to cut down the length of the triple siding. The utmost to which the siding could be reduced would be the length of one building, namely, 360 feet. The plan shows rather a restricted area for a cross-over at the eastern end. At that end we run into heavier excavations. The excavation tails out to nothing opposite the third building. There is a dip in the contour opposite that building, and that would be a good place for depositing the spoil. I did not state the excavation quantities in my estimate, because they would depend on the actual length of railway assigned by the railway engineer. I foresaw the difficulty in regard to excavation and grading. The only possible alternative was, while still keeping parallel to the main road on the south, to skew the railway round in a south-easterly direction, thus avoiding the highest points of the saddle. In that way one could obviate the excavation for the vehicle sheds. Another advantage would be that the south-western corner, which is low, would have been avoided, because the equipment sheds would then have been to the south of the siding, and the vehicle sheds to the north. But there was an objection to having the vehicle sheds on the northern side, because the southern side is the more convenient for mobilization. Therefore, although I could have submitted a lay-out that would have been more economical in respect of excavation, I was not prepared to recommend it as the best solution of the problem. Another factor was that this location, running parallel to the road, lends itself to extension into the land lying to the east, whereas if we had skewed the railway to the south-east it would have meant a curve along the lower Kobyboyn-road. I mention these facts to assure the Committee that the question of earthworks did receive serious consideration. I repeat that the Department could carry on with 300 feet less of triple siding, but I do not know whether the shorter length would be convenient from a railway point of view, because of the number of trucks that would have to be handled; the train might over-lap the crossover at the eastern end.

I came into contact with the "Gawco" system of steel construction some months ago in connexion with a possible sea-plane station, and I fully recognise its advantages in construction in outlying localities. It has advantages also as a repetition job. Once you get any standard construction you can reproduce it time after time, and that means economy. I have considered the Gawco system again in relation to the stores at Seymour, but for those buildings other types of construction would lend themselves equally to repetition. For instance, the ordinary steel truss construction with angles and rivets becomes a repetition job, and a building of that kind would have all the advantages in repetition that the Gawco system has. So far as we can see, the trusses which the Gawco engineers propose will do the work that is required of them. The only thing which might militate against the efficiency of the job is the use of cast iron in tension. I do not know of any other manufacturer of structural steel who uses cast iron in tension. The Gawco people say that they are sure there will be no flaws in casting, but if there were a flaw there would be a failure in that truss in tension. The Gawco system is extremely ingenious, and it has the advantage that it takes the full benefit of any section of steel that is used, there being no rivet holes through it. I made some inquiries, and had estimates prepared as follow:—Standard steel construction, 32 trusses would cost £1,080 per building; Gawco bays at 10 feet intervals, 56 trusses, £1,148; hardwood principals, £760; and oregon principals, £1,032. All these prices are free on rail at Melbourne. As I pointed out to the Committee when I gave evidence on the former occasion, we are limited in respect of both

time and materials. I find that steel has not hardened in price; in fact, ordinary structural steel is a little easier in Melbourne at the present time. Whether it will continue so for the next few weeks one cannot say. The price of timber has increased slightly. *What I suggest to the Committee* is that tenders might be called for, and having regard to the pressure of time, we should indicate our readiness to accept more than one low tender. I would give every method of construction an opportunity to tender. That is the only way in which we can get the work done quickly; moreover we shall obviate the possibility of any one cornering the material we intend to use. The Gawco system has many advantages; there may be cases in which it would be superior to other methods of construction. But there are no diagonal struts or ties from the Gawco trusses to the vertical posts. That means that we have to increase the size of the posts, because the wind pressure would tend to bend them. I think the proper thing to do would be to call for tenders, and let the Gawco people put in a price for their trusses. Ultimately we might decide to put in some standard steel, some Gawco, and some timber.

159. *To Mr. Bamford.*—We might have to accept more than the lowest tender. If tenders for different types approximated fairly closely, we might, in order to get the buildings erected in the time at our disposal, accept more than one tender and more than one type of construction. I consider the Gawco construction sufficiently strong for the purpose, but if the tenders for structural steel riveted and Gawco were equal, I would take the former, because it eliminates cast iron in tension.

151. *To the Chairman.*—We would commence the earthworks, and put down the stumps for the buildings without waiting for the railway, but I would prefer that the railway should be built before construction is commenced, because there would be less trouble in the handling of the material. It is important that arrangements should be made with the Railway Department as soon as possible for the construction of the siding to be commenced without delay. I understand that the stores at Liverpool, comprising 199,920 square feet, cost £43,452, whilst the estimate for the buildings at Seymour, comprising 210,000 feet, is £33,000. The difference in cost is explained by the relative prices of material at Seymour and Liverpool. The Liverpool Stores were erected with a cheap parcel of timber obtained from the Government of New South Wales, whilst the iron was imported from America at a fairly low price, at least £10 per ton cheaper than it could be bought now. All round there has been a considerable rise in the cost of material.

152. *To Mr. Bamford.*—If the height of the walls was reduced to 8 feet, the building would look very squat and unsightly. Moreover, the lighting and ventilation would be interfered with. Any saving that would be effected would not be very great. I do not think much advantage would be gained in respect of the reduction of the wind pressure on the posts. I think that 4 x 4 inch stumps will be sufficient to carry the floors and their loads. The proposal is that the floor should be carried on 4 x 4 inch stumps, with a 12 x 4 x 2 inch footing, or 9 x 9 inch brick piers.

153. *To Mr. Mathews.*—Undoubtedly the cheapest construction will be in hardwood if we can get it. We have worked out the strength requirements by a stress diagram, and there is no doubt that the principals we are proposing will carry the load. I am quite satisfied that the hardwood is good material for this purpose. I would use hardwood throughout if we could get it, but I doubt if we can. I do not think that any benefit would be derived from reducing the height of the walls by 18 inches or 2 feet. It may be that at Liverpool there appears to be a lot of waste space in the buildings, but possibly the method of storage could be improved. The buildings have to be designed to accommodate the largest vehicles, unless the Defence authorities arrange to concentrate all the large vehicles in certain buildings. It must be remembered also that the higher the building the better the temperature and air circulation. By reducing the walls of the buildings by 18 inches we would save only about £72 worth of material in each of the five buildings. I think that in the long run that extra cost would be more than compensated for by the better air circulation and the keeping of the heated roof further away from the contents. Another consideration is that, although there may appear to be a lot of waste space now, the authorities, if pressed for space, could make much greater use of the buildings by more economical storage.

154. *To Senator Newland.*—I have always been doubtful of the advisability of leaving one side of the buildings open. I believe that the authorities will find that a great deal of straw, paper, and other *débris* will accumulate in the buildings. If experience shows them that the open side is unsatisfactory, the buildings can be cheaply closed in with light doors or shutters. The double-leafed doors at Liverpool have proved to be a mistake. All that is required is a light single-leafed door or shutter. *My suggestion is that* the advisability of having the sheds open or closed should be left to be determined by experience. In regard to the width and height of the doors at Liverpool, the authorities did not know how the vehicles were to be distributed, and therefore all the doorways were designed to be high enough to admit the largest. In regard to the width of the doors, my recollection is that the Defence authorities desired the whole side of the building thrown open in order to avoid loss of space and delay in getting the vehicles out. My suggestion is that there might be posts at intervals of 16 feet and a system of cheap shutters, or light hinged doors, with a central post, to open out the front of the building in time of mobilization. The Defence authorities are anxious to obtain the full opening between the posts, and not to have anything to restrict the working space. I have had a computation made that sliding doors would cost £69 per 16 feet opening. It must be remembered that the carriers, pulleys, and guiding rails are expensive. Cheap folding doors, ledged, braced, and unframed, on the same lines as the doors at Liverpool, but in one leaf, and dividing the one 16-ft. into two 8-ft. openings, would cost £49 per 16-ft. opening. Shutters which could be moved entirely would cost £26 per opening. Shutters and doors might be used in combination. There are eighteen bays in each building. Six bays might be equipped with folding doors at a cost of £300, and the other twelve bays with shutters at a cost of £27 each, making an approximate total cost of £660 per building. Or we might have eight doors and ten sets of shutters, or two sets of doors and sixteen sets of shutters. For the time being, however, I suggest that the Defence authorities should be allowed to make their experiments, and that later, if found necessary, the openings should be enclosed with either shutters or doors according to requirements. Some bays in which small vehicles were stored might have shutters, whilst those in which larger vehicles were kept might be equipped with doors. The only disadvantage in the shutters is that they let in no light, whilst the folding doors have the disadvantage of giving only two 8-ft. openings instead of one opening of 16 feet, as in the case of shutters. I have always doubted the wisdom of having one side of the building open, and I think my view will be proved in time. The general tendency of the weather at Seymour is from the south-east through the west to the north. The openings will be to the east, thus giving the best possible protection against the prevailing wind. If the buildings are allowed to remain open the vehicles will become coated with dust, and also mud, to some extent, in the course of five or six years. There will also be accumulations of straw and newspapers. I do not know whether the vehicles will deteriorate much, except those which, being near the openings, get the brunt of the weather. My opinion is in favour of closed buildings. I think it would be an advantage to enclose the space between the ground and the floors of the equipment stores with netting or some protective material of that kind.

155. *To Mr. Parker Moloney.*—The price quoted to me for Gawco was for the trusses, f.o.r., Melbourne. No quotations for erection was given; in fact, I do not think the Gawco Company is a building firm. Gawco trusses would probably require a little more care in handling, but standard structural steel would be a little heavier. I do not think there would be a great deal of difference between the two in the cost of erecting. *My suggestion is that* we should buy the prepared trusses from the mills and erect the buildings by day labour. The only weak point in the Gawco system is the use of cast iron in tension. That is a departure from ordinary engineering practice, and its efficacy is not yet proved. Apart from that objection, the Gawco construction would be as substantial and lasting as the construction designed by the Department.

156. *To the Chairman.*—The advantage of having the doors the width of two vehicles is that it gives greater expedition in the handling of the vehicles. In mobilization time it is a big consideration.

157. *To Senator Needham.*—I suggest that sliding doors, because of their cost, are not worth consideration. There is this further objection, that a sliding door always closes up some area of wall space; the whole side of the building cannot be thrown open. Another alternative is the accordeon sliding door, which would cost about £62 per opening; but I do not recommend it for these buildings. The ordinary folding door is the best for the purpose. If the matter were left to my discretion I would close in the buildings entirely. The absence of rivet holes would not compensate for the weakness of cast iron in tension. In taking out the strength of a member in structural steel, what is removed by the rivet holes is eliminated from the calculated strength of the member. I do not think that standard steel construction would require more skilled labour than Gawco. In the event of our deciding to obtain the completed sections from the mills, the cost of transporting Gawco sections and standard steel sections respectively to Seymour would be very much the same. Possibly the railage of Gawco would be slightly cheaper, because more sections would nest into a truck. I will let the Committee have an estimate of the cost of railage for Gawco, standard steel, and timber sections. All the trusses, whether Gawco, standard steel, or timber, would be made in the shops, and riveted up before being sent to Seymour. The chance of anything going wrong with a riveted truss is negligible. The use of bolts instead of rivets would increase the cost, without giving any sufficient compensating advantage. The Gawco system would not interfere with the lighting or ventilation. It would involve a slight increase in the height of the roof, because the Gawco trusses would not be as flat as the timber trusses. It would require also a little more roofing iron, say about a dozen extra squares for each building, at a cost of £3 or £4 per square. I do not think the additional cost on that account would be sufficient to turn the scale for or against the Gawco system.

158. *To Mr. Atkinson.*—I first proposed to advise the Minister to call for tenders for the construction of these buildings by contract. Later, I thought of a middle course, namely, that we should call for tenders for the trusses and all mill-prepared parts, and then call for tenders for the erection. But I am of opinion now that the quickest way to carry out the work will be to call for tenders for all the parts, and then do the erection by day labour. That will not involve any increased cost.

159. *To Mr. Bamford.*—In the event of the Gawco construction being adopted, we should have to put in more purlins than are shown on the plan submitted to the Committee. I recommend the use of hardwood purlins, if we can get them. I would use as many hardwood trusses as we can get, because hardwood is good for this purpose, and is very much cheaper. It is impossible to get seasoned hardwood now, but that does not matter in connexion with a structure of this kind. If the timber does twist a little, no damage will be done. Even if the king and queen posts warped open at the joints there would still be the safeguard provided by the wrought iron straps. As a precaution against fire, I think it would be advisable to erect one or two additional cottages, so that at least some of the employees might reside on the spot. I understand that it is proposed that some men shall live at Seymour, and receive some sort of lodging allowance. If they lived in cottages near the stores the Department would get increased value from them, because they would be on the spot to help in the event of fire. The fire risk will be in connexion with the contents of the building, and unless an outbreak is coped with quickly, nothing will be saved. Therefore I would suggest that, in addition to the caretaker, there should be a sort of civilian guard resident near by. If tenders were accepted as soon as this work is approved by the Committee probably nine months would elapse before the whole job was completed, although some of the buildings would be available for use earlier. I think that bricks laid on the flat will make a sufficiently strong floor for the vehicle stores, provided the bricks are bedded in sand.

160. *To Mr. Mathews.*—I would not favour a shutter hinged from the top, and hanging down. I proposed that system for an aeroplane hangar, but I was soon convinced that I was wrong. There is always a danger of a door which is propped up getting adrift. Unless there is a considerable rise in the cost of building material it will not cost a great deal more to enclose the sheds later than it would to do it to-day.

161. *To Senator Needham.*—Sprinklers should be installed at selected portions of the building, according to the nature and value of the contents; but no such provision is included in the present scheme. That may be allowed to develop. Let the authorities decide how their stores will be distributed, and then the sprinklers can be installed afterwards at no additional cost. Sprinklers are not necessary for the vehicle stores.

162. *To the Chairman.*—In accordance with the expressed wish of the Committee, two samples of water were taken, namely, (1) from the Goulburn River, near the suction pump pipe of the pumping station, and (2) from the Falls Creek supply from above its junction with the pumping supply. These were forwarded to the Commonwealth Analyst, who has supplied the Secretary of the Committee with the following analyses:—

(1) Goulburn River water (near suction pipe)—
Solids, 2.8 grains per gallon.
Salt, 1.2 grains per gallon.
Free ammonia, 0.01 pt. per 100,000.
Alb. ammonia, 0.013 pt. per 100,000.
Organic matter, 0.65 pt. per 100,000.
Sample contains small quantity of suspended matter, mainly earthy.

(2) Falls Creek supply to Seymour—
Solids, 7 grains per gallon.
Salt, 5.3 grains per gallon.
Free ammonia, nil.
Alb. ammonia, 0.017 pt. per 100,000.
Organic matter, 0.85 pt. per 100,000.
Sample was clear.

The two waters are suitable for use as boiler waters, and the chemical analysis did not disclose any bad features in respect of use as potable waters.
In regard to the sanitation arrangements, I am confident that the Keenstine system will prove efficient.

(Taken at Melbourne.)

MONDAY, 31st MAY, 1920.

Present:

Mr. GREGORY, Chairman;

Mr. Atkinson,	Mr. Mathews,
Mr. Bamford,	Mr. Parker Moloney

Frank Herbert Geach, solicitor, Glenroy, sworn and examined.

163. *To the Chairman.*—I am representing a public meeting of 250 residents of Glenroy, Pascoe Vale, Broadmeadows, Campbellfield, and the district immediately surrounding Broadmeadows Camp. The meeting was held for the purpose of discussing the proposal to shift the camp to Seymour, and to construct certain military works at the latter place instead of at Broadmeadows. I understand that a reference has been made to the Committee for the erection of stores for equipment and mobilization at Seymour, and that this involves certain expenditure and other considerations in connexion with a permanent camp in Victoria. The meeting was a large one, and at the outset it was recognised that the "parish" aspect of the question should be altogether eliminated, and that the matter should be viewed from a national stand-point. The opinion of the meeting was that, until the public finances were more stabilized, expenditure for this purpose should be postponed for three or four years, and that, in the meantime, the storage at Broadmeadows should be utilized. Personally, I know nothing of the Seymour camp, except from what I have been told. I have resided at Broadmeadows for twelve years, and have seen the camp grow from a paddock to a very big military camp; and I suppose there are acres of buildings there doing very little work. It was thought that these buildings could be utilized for the purpose of storing equipment, and that the Seymour proposal might stand over to a later date. I know that at Broadmeadows there are approximately 150 acres, on which probably £150,000 has been spent on buildings and improvements. From hearsay I understand that at Seymour there are about 700 acres, on which moneys have been spent for certain military purposes that the proposed camp there is to be placed on land to be purchased on the other side of the line, between the town and the camp, involving a railway line estimated to cost £7,000 or £8,000. In regard to Broadmeadows, the water question seems to have loomed very large in the evidence previously given to the Committee. I think it is said that the cost of the water supply to Broadmeadows is estimated at £12,000, and at £3,000 or £4,000 for Seymour; and that is a great contrast. The meeting which I represent would like to emphasize the fact, in regard to the water question, that Melbourne is marching quickly to the 1,000,000 mark in population, and that within five or six years, or, say, ten, Melbourne will be a very large city, and all land within 10 miles will become residential. The Broadmeadows Camp is within 10 miles of Melbourne. I think the population of Melbourne now is 600,000 or 700,000, and we may naturally expect a development. We may expect, considering the primary industries that the returned soldiers may bring into being, and so forth, the development to react on the city. Again, there is a great possibility that we shall have an influx of immigrants from Great Britain during the next few years. It is a remarkable fact that, in the northern areas from Coburg, during the last ten or twelve years, quite 75 per cent. of the settlement has been by people from overseas, who seem to like the green territory there. There is the further fact that the land is cheaper than south of Melbourne, and they, apparently, do not mind roughing it a bit in order ultimately to get rid of the landlord. I think that the people from Britain will mostly go northwards, where, for 8 or 10 miles, the land stands very high. The land there may be worth 7s. or 10s. a foot, whereas south of the Yarra it is £3 or £4, and this will be a strong determining factor. As to the water supply, on which it is proposed to spend £42,000, there is an area south of the camp of 6,000 acres running approximately from Essendon to Broadmeadows for 5 miles, and from Coburg to Campbellfield for another 5 miles; and all this land is very suitable for a high-class settlement. On the south end, the level above the sea is 250 feet, and at the north end, at Broadmeadows, 550 or 600 feet. That means a very high plateau of 6,000 acres, from 5 to 10 miles radius of Melbourne, suitable for settlement. It would cut up in quarter-acre blocks, and mean a population of 25,000 families. Up to the present, I have placed people in that area on 1,500 quarter-acre blocks, and these people are waiting for better travelling facilities, including the electrification of the Essendon line and the opening of the line on the east side, and also for a proper water supply. The water supply is a grave question in summer, when people have to go round with kerosene tins and little carts to collect water. A water supply would quite make the district civilized, and relieve in a great measure the strain on the inner suburbs of the city. As a solicitor, I often put through transfers for homes on land as small as 10 feet and 12 feet frontages, with a depth of 30 feet; and that, in Australia, seems to be a monstrosity. Since the passing of the Health Act of 1890, that has been impossible, but prior to the passing of the Act there was nothing to stop it. Some of them really live in hutches, because they cannot pay the price for land in the south; they would gladly go to the north for land if there were facilities for travelling, and a water supply. Many of them are not there by choice, but from necessity. In this evidence, and in the figures I have given, I speak from personal knowledge, and I know that numbers would go to live there to-morrow if proper facilities were afforded. The expenditure of the proposed £42,000 for a water supply would not serve Broadmeadows alone, but would develop a magnificent area of 6,000 acres of building land close to Melbourne. That is on the south side of the area, but on the north side there is another large area where I have sold 200 quarter-acre blocks, and the people are waiting for the railway to open. Many are now putting up shacks in order to avoid the payment of rent every Monday. The proposed expenditure of £42,000 might reasonably be distributed between the Broadmeadows shire, the Coburg shire, and the Metropolitan Board of Works. I should say that nine-tenths of the water supply could be used for improving settlement, and one-tenth to the camp. From 1914, for five or six years, the camp went on with two 6-inch pipes, and there were then there 15,000 to 20,000 men. It seems strange to have to spend £42,000 straight away, just for the purpose of providing accommodation for equipment; and I must say that I do not quite know what that means. The mobilization of any large force is hardly possible in the next three

or four years after this war. Even in the case of a permanent camp, my argument would hold; from the residential character of the district we might reasonably expect the largest bulk of the £42,000 to be used for the purpose of supplying the residents with water. I should think that 100 acres would be sufficient for the proposed buildings, and yet leave plenty of room for other purposes. I live alongside the Broadmeadows Camp, and in the early stages the conditions there were very bad; but later money was spent, and in wet weather we now call the conditions good. However, I am a Gippslander myself, and may be accustomed to bad roads; but I consider the roads mostly very good. The residents there are very few, but I never heard any exception taken to the camp; there could be none with the men under discipline. If the Government consider it necessary to have 600 or 700 acres, it would cost a lot of money to purchase adjoining lands at Broadmeadows. To-day one would probably have to pay £40 or £50 an acre. You see, this is residential land, within the 10-mile radius, and every year that goes over would make the land more difficult to buy. The country is sticky in wet weather.

164. *To Mr. Parker Moloney.*—When the 15,000 or 20,000 men were in camp, I never heard any complaints about the water supply. I did not know of the special arrangement to increase the pressure beyond the two 6-inch pipes; in any case, £42,000 has been quoted for the water supply. I understand now that a special arrangement was able to supply the camp, but other people had to be cut off in consequence. The local feeling is that the prospects now of 15,000 men being camped there are very remote. I do not know Seymour, and cannot express an opinion as to the relative suitability of the sites.

165. *To Mr. Atkinson.*—What I thought was that the equipment and so forth could be stored in the buildings at Broadmeadows for three or four years, and thus save the expenditure on the buildings at Seymour. If the Committee have been told that that cannot be done, I can only say that I merely throw out a suggestion to you. If the military authorities require 300 or 400 acres, they would not get the land at Broadmeadows under £40 or £50 an acre.

166. *To Mr. Bamford.*—I have had no military experience overseas, but I have been 25 years connected with the Mounted Rifles, the University Officers, and the Army Service Corps. I did volunteer for active service, but was too old. I have had no experience in the handling of large bodies of men; the Army Service Corps only handled equipment. I should not say that the acreage of Broadmeadows would be sufficient to handle large bodies of men in training, though, of course, in the old days, a battalion was a large body. When I am asked to say whether it would be necessary to purchase more land at Broadmeadows for the purpose of the military authorities, I am treading on dangerous ground, because I am not a modern professional military man. If a witness has said that at Broadmeadows the land in wet weather was "ankle-deep" in mud, I may point out that these conditions have been remedied. There would be a track right through, and I think that "ankle-deep" is rather an exaggeration. I have lived in the neighbourhood continuously for ten years, and no doubt the soil sticks to the sole of the boot, but "ankle-deep" is scarcely correct. The men, in marching, would march in the grass paddocks, and in the grass paddocks adjoining the camp we have never discovered any mud. However, professional military men are the men to decide that question. As to whether it is an advantage to have a camp so close to the city, I should say that being 10 miles from the seaboard would make a great difference in transit work as compared with 60 miles. Incidentally, I say say that the meeting I represent felt that the shortage of trucks for firewood and primary producers generally would be intensified if the camp were made at Seymour, and that the proposal for a camp at the latter place might be postponed for a year or two. There is a railway line within 20 chains of the camp at Broadmeadows. I cannot say why the Railway Department has not opened that line. It was closed by Mr. Tait, the Railways Commissioner, twenty years ago, but the pressure of population must force on the Coburg to Somerton line, apart from the camp altogether. A good deal of land in the neighbourhood has been cut up, but there is still a lot in large areas. I do not represent any of the land-holders there. Having looked at the plans of the buildings at Seymour, I must say there is nothing of the sort at Broadmeadows. The only question is whether the erection of the stores at Seymour could not be postponed and the area at Broadmeadows utilized. I should say that the proposed stores at Seymour are of the class which will ultimately be required; but the question is whether they should be provided now. If the experts say that the storage proposed at Seymour is not too large they ought to know what is required.

167. *To Mr. Mathews.*—This land, being within 10 miles of Melbourne, must be recognised as residential, and I understand from you that that is one of the arguments that has been used against the location of the camp there; at any rate, the land could not be bought for very short of £40 an acre. If the military authorities require 700 acres, Broadmeadows is not suitable, in view of the fact that people have to pay so highly for breathing space. I think that the fact that an area of 700 acres is regarded as the minimum for a camp puts a different complexion on the matter; but the people whom I represent doubt whether it is absolutely necessary now to spend money on providing accommodation at Seymour. I will put the view of the Committee to those people, for the Committee have brought me round to their way of thinking. If what is required is a big equipment store there for all time—a permanent camp—Broadmeadows is only a mere pygmy place.

(Taken at Melbourne.)

TUESDAY, 1st JUNE, 1920.

Present:

Mr. GREGORY, Chairman;

Senator Needham,	Mr. Mathews,
Mr. Atkinson,	Mr. Parker Moloney.
Mr. Bamford,	

William Henry Poole, President of the shire of Broadmeadows, sworn and examined.

168. *To the Chairman.*—I am attending as President of the shire of Broadmeadows and a representative from a public meeting held at Glenroy on the 24th May in connexion with the proposal to remove the existing military buildings from Broadmeadows. We are opposed to the removal of the camp from Broadmeadows. At the outbreak of the war the shire was involved in considerable expenditure for the construction of the camp road. In normal times this work would have cost a few hundred pounds, but owing to the circumstances under which it was done it cost the shire £3,845. Maintenance since then has cost, on

an average, £600 per year, and the road is now in need of attention again It was reconstructed, after having been worn out by camp traffic, at a cost of £3,600, of which the Defence Department contributed about £1,800, but more than half of the contribution was spent in the erection of cab stands, construction of drains, &c., which was insisted upon by the Defence Department, so that the council practically found £1,800 as compared with about £900 contributed by the Defence Department. We feel, therefore, that we are justified in opposing the removal of the camp, because, in our opinion, it is suitable for all requirements. During the war the military authorities handled up to 20,000 troops at Broadmeadows, and, in view of this fact, we fail to see how it can be regarded as unsuitable for future needs. It is an asset to the shire, as Broadmeadows at present is languishing for lack of an improved water supply for domestic and other requirements, and if the camp is maintained there will be more likelihood of securing an adequate and permanent supply. The railway facilities are already available, as loop lines could be constructed from either Broadmeadows or Campbellfield. This arrangement, from a railway construction point of view, is quite as good as, if not better and cheaper than, the Seymour proposal. Electric light was installed for the camp, but at present this is being dismantled. We contend that, with some slight alterations to the existing buildings, they would meet all future requirements. I am speaking from a national point of view. Broadmeadows is only 9 miles distant from the city, whereas Seymour is 60 miles. The water supply provided for the camp was 40,000 gallons per day. During the first months of its occupancy as a training ground the conditions were not all that could be desired, but when the place was metalled and gravelled and streets formed through the area, the conditions were quite satisfactory. I must admit, however, that I was not aware of the exact nature of the scheme which the Government have in hand. I did not know that the erection of five large vehicle stores, each 300 feet x 100 feet, and two other stores, also 300 feet x 100 feet, were contemplated for the accommodation of war equipment. But I should think that more land could be obtained at Broadmeadows. There is another matter which I might mention. For a long time we have been agitating for the re-opening of the Somerton railway line, and we think that the maintenance of the camp at Broadmeadows will be an inducement to the authorities to favorably consider this proposal.

169. *To Mr. Bamford.*—I could not say at what price land might be obtainable, but it is not likely to be so cheap as at Seymour.

170. *To the Chairman.*—I should say that about £40 per acre would be a fair price. I am not conversant with land values in Broadmeadows, as I live 10 miles distant. When in camp the men were sometimes trained in the adjoining fields, but I think that most of the work was done on the area acquired by the Defence Department, and laid out as a training camp. I am aware that the Metropolitan Board of Works has intimated that the pipe line, made available for the camp water supply, cannot be continued any longer, the reason given being that it interferes with the city supply, and that if it is intended to continue with the Broadmeadows scheme it will be necessary to tap the main about 14 miles higher up. This work will cost about £43,000. We have been agitating for many years to get a better supply. During the war period, and while the camp was occupied, we approached the railway authorities with the object of having the railway line to Campbellfield re-opened, and we could never understand why it was not done, because it would have been cheaper to enter for the requirements of the camp on that line than from Broadmeadows.

171. *To Mr. Mathews.*—I was unaware that other municipalities, such as South Melbourne, had not been recouped by the Defence Department for expenditure incurred in the maintenance of roads used by troops. We took the stand that as the training of troops was a national matter, we should not be called upon to pay more than a fair proportion of expenditure for the construction of roads; but we had to pay more than half the cost. We are not anxious to have the camp area made available as residential sites, because we consider we have sufficient ground for that purpose already, and besides the whole area is laid out in roadways and streets. After the first month or two I do not think any complaints were made about the condition of the Broadmeadows camp roads during the wet weather. I dare say that an additional 1,000 acres could be obtained at Broadmeadows, if necessary. The price would be higher than at Seymour, but there would be a saving in the matter of removing the buildings. I was not aware that the military authorities considered Broadmeadows too close to the city.

172. *To Mr. Parker Moloney.*—I do not know anything of the proposed Seymour area, but I have read that it is about 2 miles distant from the town. I am not in a position to criticise the opinions of the military authorities. I can understand that their first consideration would be suitability of site. If they declare that, owing to the nature of the soil at Broadmeadows, the Seymour site offers more advantages, I will still stick to my opinion that it would be unwise to shift the camp. I admit, however, that probably it would be desirable to have the mobilization stores near the concentration camp. It has been said that the soil at Broadmeadows is suitable for agricultural purposes, whereas that at Seymour is not, but, so far as the camp area is concerned, it has been so heavily metalled and cut up that it is useless for agricultural operations.

173. *To Senator Needham.*—In the selection of a site for a concentration camp, I should say that the health of the men should be the first consideration, and that being so, I would look for the very best site. If the camp had not been established at Broadmeadows the shire would be in a much better position, because we would not have been called upon to spend over £2,000 of the ratepayers' money.

174. *To Mr. Atkinson.*—The Broadmeadows camp accommodated 20,000 troops at one time. It is true that the men were sometimes trained on outside areas adjoining the camp, but I always thought that that was merely part of their route marches and other operations. If an additional 300 acres were acquired I do not think the land would become sticky in wet weather. It must be remembered that at the time when complaints were made about the conditions of the Broadmeadows camp, no roads had then been constructed, and there 20,000 men were concentrated on a small area. For reasons of economy, I do not think it would be wise to move the Broadmeadows buildings. If the Defence Department decided to abandon the Broadmeadows camp it is possible that the area could be sold in quarter-acre or half-acre residential allotments, provided a better water supply were assured, and improved railway facilities made available. We are hopeful that if the camp is not removed these things will be obtained. The ratepayers at Broadmeadows are prepared to submit to any fair and legitimate taxation scheme in order to insure a better water supply. On the 9th June we intend to wait upon the Metropolitan Board of Works in connexion with this matter. Now

that I have seen the plans of the proposed mobilization and equipment stores, I admit that the buildings at Broadmeadows could not be converted economically for the housing of all the war equipment that is coming to Australia, but still I think a lot of material at Broadmeadows could be used profitably.

175. *To Mr. Bamford.*—I would not say that the Defence authorities, in evidence which they have given, have not looked at this proposal from a national standpoint; but our own history teaches us that many things have been done that have not been in the best interests of the country, although at the moment I cannot specifically mention any particular matter. The Broadmeadows shire did not make any of the roads within the camp area, and we get nothing from it in the way of rates. If the area were cut up into residential blocks and sold the shire would obtain some return from ratepayers; but there is a danger that the land would not sell readily. If the Defence Department required a larger area at Broadmeadows, the land could, I think, be obtained to the north of the present site. As there were to be only one residence on the camp site, to be occupied by a guard, and as the area would be used only at intervals for training purposes, perhaps the Defence Department would not feel disposed to go to the expense of providing a permanent water supply, up to 700,000 gallons per day. I have seen the plan of the Liverpool camp area, and I notice that it is provided with rifle ranges. The land at Broadmeadows is all flat country, and would, therefore, not be quite so suitable for rifle ranges or artillery practice. I am not prepared to say whether it would be advisable or not to have large magazines established in residential areas. If the camp were not removed from Broadmeadows I believe there would be a good chance of inducing the Railways Commissioners to re-open the section of the railway line referred to. I think the statement that in the early stages of training at Broadmeadows the men were ankle deep in mud was an exaggeration. For the first few months the conditions were not good, but after the roads were made there were no complaints.

176. *To the Chairman.*—During the war period it was found necessary to establish an artillery camp at Maribyrnong. If General White says that it would not be wise to contemplate accommodating less than 45,000 troops in the concentration camp, I agree that a larger area would be required than at present is available at Broadmeadows, and I do not think the land could be got for less than £35 or £40 per acre.

177. *To Mr. Bamford.*—Probably there would not be much loss in regard to buildings, whether they remain at Broadmeadows or are removed to Seymour.

Albert Thomas Cook, Shire Secretary, Broadmeadows, sworn and examined.

178. *To the Chairman.*—Reference has been made to the action of the council concerning the re-opening of the Coburg-Somerton railway line, and I wish to state that the council used every endeavour during the war to have it re-opened. We saw the Minister for Defence. He informed us that the matter had been referred to a special committee of the War Council, comprising the Commonwealth and State Railways Commissioners, who, I think, were influenced by the Victorian Commissioner (Mr. Fitzpatrick). He was then very much opposed to the re-opening of the line. The committee assigned no reason for its decision other than that the line was not necessary for war purposes. This section of the line is not being used at present. We are trying to have it re-opened, with the object of avoiding some of the congestion at Spencer street. Land adjoining the present camp is assessed at anything from £15 to £20 per acre, and a property, almost adjoining the camp, was sold two or three years ago at between £17 and £20 per acre. The Department has the power to acquire land, and exercise this authority in respect of the present area at Broadmeadows. I think the price paid was about £10 per acre, but the improvements taken over with the land were, I think, equivalent to about £20 per acre on present-day values. I admit that in the early stages of training the position of the camp was exceptionally muddy, but matters greatly improved after the construction of the road. Troops were trained for the first six or eight months on land other than that reserved for the camp, but after that, I think, they were confined principally to the camp area.

179. *To Mr. Bamford.*—I am not aware of any complaint having been made by residents concerning the presence of troops in the Broadmeadows camp. Occasionally complaints were voiced, but not made publicly.

Printed and Published for the Government of the Commonwealth of Australia by Albert J. Mullett, Government Printer for the State of Victoria.