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Senator Skerland



Pursuant to Statute

By PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS,

In return to Order

Geo. Monahan

Clerk of the Senate,

9-9-20 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
MOBILIZATION AND VEHICLE STORES, MIDLAND JUNCTION, WESTERN AUSTRALIA.

2012
9/9/20

1920.

COMMONWEALTH OF AUSTRALIA

PARLIAMENTARY STANDING COMMITTEE
ON PUBLIC WORKS.

REPORT

TOGETHER WITH.

MINUTES OF EVIDENCE

RELATING TO THE PROPOSED

MOBILIZATION AND VEHICLE STORES, MIDLAND
JUNCTION, WESTERN AUSTRALIA.

MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

Third Committee.

The Honorable HENRY GREGORY, M.P., Chairman.

Senate.

Senator Hattil Spencer Foll.*
 Senator George Henderson.†
 Senator John Newland, Vice-Chairman.‡
 Senator Edward Needham.§
 Senator William Plain.*

House of Representatives.

Melvyn Atkinson, Esquire, M.P.
 The Honorable Frederick William Bamford, M.P.
 George Hugh Mackay, Esquire, M.P.
 James Mathews, Esquire, M.P.
 Parker John Moloney, Esquire, M.P.

* Appointed 25th July, 1920.

† Resigned 22nd July, 1920.

‡ Re-appointed 24th July, 1920.

§ Ceased to be a Member of the Senate, 30th June, 1920.

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EXTRACT FROM THE VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES,

No. 40 OF 7TH JULY, 1920.

7. PUBLIC WORKS COMMITTEE—REFERENCE OF WORK—MOBILIZATION AND VEHICLE STORES, MIDLAND JUNCTION.—

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 Midland Junction, Western Australia, with necessary railway connexion, water supply, &c.

That the Committee be empowered to sit whilst the House is sitting.

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, MIDLAND JUNCTION,
WESTERN AUSTRALIA.

REPORT.

THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS, to which the House of Representatives referred for investigation and report the question of the provision of Mobilization and Vehicle Stores at Midland Junction, Western Australia, with necessary railway connexion, water supply, &c., has the honour to report as follows:—

INTRODUCTORY.

1. The materials used by the Military Forces of Western Australia are at present stored in various buildings in and around Perth,—a large proportion of the materials being housed in the old Exhibition building in Hay-street, others in the King's Warehouse, drill-sheds, &c. The Customs authorities are desirous of obtaining the King's Warehouse for Customs purposes, and the lessees of the Exhibition Building have given notice of termination of the tenancy of that building, so that it is necessary to obtain other premises for storage purposes. In addition, a quantity of material used by the Australian Divisions engaged in the recent war is being returned to Australia, and, under the policy of the Department, portion of such equipment is being allocated to Western Australia, and provision for storing it requires to be made accordingly.

PRESENT PROPOSAL.

2. The proposal now under consideration is to erect, on a site which has been acquired at a distance of about 60 chains from the Midland Junction Railway Station, and 10 miles from Perth, storage accommodation for the usual military requirements of Western Australia, i.e., Ordnance Stores, as well as accommodation to house these materials coming from overseas, which will comprise complete equipment for an army having to take the field in the event of war, i.e., Mobilization Stores.

3. The buildings proposed comprise one Ordnance Store, one Mobilization Store, one Vehicle Store, one small Arms Ammunition Store, one Office, and a Caretaker's Cottage.

4. The construction proposed to be adopted for the Ordnance, Mobilization, and Vehicle Stores is wooden framing, with galvanized iron for the walls and roof. The timber proposed is jarrah for the wall framing and karri for roof framing. The Office and the Caretaker's Cottage are to be of brick.

5. *The Ordnance Store* is proposed to be of a length of 306 feet by a width of 100 feet, 25 feet high in the centre, and 11 feet high at the sides. It will be divided into two stores by a 9-in. brick wall across the centre. This wall will have at intervals strengthening brick piers 18 inches thick, and will be pierced by fireproof doors. The roof is proposed to be lined with jarrah or karri to temper the heat, and the floor, which will be of timber, will be kept approximately 3 feet above the ground line. There will be a platform 10 feet wide on each side of the building, one giving access to the proposed railway and the other to the roadway.

6. *The Mobilization Store* will be of similar construction to the Ordnance Store, but of a length of 153 feet by a width of 100 feet.

7. *The Vehicle Store* is intended to be 300 feet long by 100 feet wide, 20 feet high in the centre, and 11 feet high at the sides. The flooring is proposed to be of bricks, laid on the flat in sand and grouted with cement.

8. *The Ammunition Store* is proposed to be a brick building 60 feet long by 80 feet wide, and so constructed that it may be extended to twice the size if required. The walls are to be 14 feet high, and the building is to be provided with a double roof to insure coolness and ventilation. The outer roof will be of galvanized iron and the inner roof of malthoid. There is to be a 2-ft. space between the two roofs to secure the free passage of air. As cordite deteriorates very rapidly when the temperature rises beyond a certain height a special and rather elaborate system of ventilation is proposed. It is said to be essential that there should be no possibility of hot air coming down the ventilators and, therefore, the ventilators entering the building through the walls and ceiling will be provided with sliding doors which can be opened or closed as desired by the man in charge. It is proposed that the building shall be raised to railway platform level. It is to be filled with sand to the floor level, and the floor will be of brick. The railway platform on the western side is proposed to be 3 ft. 3 in. wide, and the roof, which is to have a 9 ft. 3 in. projection, will extend well over the platform.

9. *The Office and Caretaker's Cottage* are proposed to be of brick, 40 feet by 20 feet and 35 feet by 46 feet respectively.

10. *Railway Connexion*.—The Darling Range branch railway runs along the western boundary of the land acquired, and it is proposed to connect a loop-line and siding from that railway to serve the Ordnance, Mobilization, and Ammunition Stores. The siding will have a gradient of 1 in 264, and, including approaches, will be over 20 chains long. It is proposed to use 60-lb. rails, as being the only kind readily obtainable.

11. *Water Supply and Fire Service*.—It is proposed to tap the Mundaring to Perth main for the purpose of obtaining an efficient water supply. A 4-in. cast-iron pipe is proposed, and ten hydrants will be erected at intervals around the buildings. It is proposed to construct a 10,000-gallon steel or iron tank on a steel stand, with piping exterior to the buildings, and to install sprinklers in each of the stores.

12. *Drainage*.—The water from the roofs is proposed to be carried by 9-in. stoneware pipes to a swamp at the south-western end of the site.

13. *Fencing*.—It is proposed to inclose the area with a fence comprising five barbed wires, the top one of which will be 4 feet from the ground.

ESTIMATED COST.

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

Ordnance Store	£10,400
Mobilization Store	5,432
Vehicle Store	7,487
Ammunition Store	3,658
Office	1,458
Caretaker's Cottage	960
Railway Siding	1,188
Fire Service—	
Tank	£700
Sprinkler installation, Ordnance Store	1,000
" " Mobilization Store	600
" " Ammunition Store	80
Excavation and levelling of site	2,280
Water supply, lighting, fencing, drainage, and contingencies	1,935
	3,372
Total	£36,870

COMMITTEE'S INVESTIGATIONS.

15. The Committee inspected the Armoury and Workshop at the Victoria Barracks, Melbourne, and examined the Chief of the General Staff, the Quartermaster-General, and other Defence Officers, the Director of Works, and the Chief Commonwealth Architect. In addition, a Sectional Committee was appointed, which visited Perth and inspected the site of the proposed buildings at Midland Junction, the Midland Junction Rifle Range, the Artillery Ammunition Store at Guildford, the Armourer's Workshop at the Victoria Barracks; Perth, and made a general inspection of various possible suitable sites. Evidence was taken in Perth from the Principal State Architect, the Deputy Chief Engineer for Existing Lines, Western Australian Railways, the Chief Officer of Fire Brigades, the Military Commandant, and other officers of the Defence Department.

16. The Committee was informed that the accommodation for the housing of military stores was adequate up to 1914, and until 1916 it was found possible to carry on by securing 5,500 feet of floor space in the old King's Warehouse. Early in 1916, however, increased accommodation was found to be necessary, and a lease was obtained of the old Exhibition Building in Hay-street east, which represents 21,000 square feet. Subsequently a number of waggons were forwarded to Western Australia and were housed at the Artillery Shed at Guildford. Later on further waggons arrived from England as part of the mobilization stores, and were stored some in the Lord-street drill hall and some at Blackboy Camp. The fact that the stores are scattered at the present time is obviously a disadvantage. The Clothing Store and Armoury are in Museum-street; the drill hall adjoining has also been taken for storage purposes. Camp stores and small arms are at Karrakatta; unserviceable stores are in the old King's Warehouse; quick-firing ammunition magazines are at East Guildford; and waggons, harness, saddlery, and accoutrements are at Blackboy. As has been previously stated, notification of termination of the tenancy of the old Exhibition Building has been received in consequence of the building having been sold; the Customs authorities are also desirous of obtaining the use of the King's Warehouse. This makes it essential to secure some other storage accommodation. After a full consideration of the facts the Committee is of opinion that it is advisable that the Ordnance, Mobilization, Vehicle, and Ammunition Stores and an Office be provided, and recommends accordingly.

SITE.

17. Careful consideration was given to the site which has been acquired for the purpose of erecting the stores under review. It comprises a strip of land 2,200 feet long by 230 feet wide, and contains about 12 acres 39 perches. The land is conveniently situated to the railway system of the State, and, after hearing the evidence of the responsible Military authorities, the Committee is satisfied that the position is suitable for the purpose for which it is intended. In view of the narrowness of the strip, however, and the fact that, for approximately 500 feet from the southern boundary, the land would require considerable filling to make it useful for building purposes, the Committee is doubtful whether the area will be sufficient for both Ordnance and Mobilization Stores, having regard to the expansion of operations that may reasonably be expected to take place. The Committee ascertained that there exists to the north of the area acquired a block of land comprising approximately 7 acres, on which is erected a substantial brick cottage. A valuation, which was obtained of this land and cottage, seemed reasonable to the Committee when compared with the estimated cost of erection of caretaker's quarters, and as the Committee is of opinion that the cottage on this block would be suitable for caretaker's quarters, and that the additional area would be most useful in permitting of a more favourable lay-out of the Defence activities, while providing for future expansion, it recommends that such area be acquired if obtainable at approximately the amount of the valuation supplied to the Committee, and that the cottage thereon be used for caretaker's quarters, and the proposed cottage on the 12-acre block be not erected.

18. In connexion with this matter of site the Committee desires to express its disapproval of the fact that the land selected was acquired prior to the reference of this work for investigation, as such action may, in many cases, hamper the Committee in its decision.

In connexion with a previous reference on the subject of the Postal Stores building at Harbour-street, Sydney, attention was drawn to this matter, and the Committee again desires to stress the point with a view to it being avoided as far as possible in the future. The remarks made on that occasion under date 20th February, 1917, were as follows:—

In connexion with this matter, it is noted that although the site was acquired on 30th June, 1914, the proposal for the erection of the building was not referred to the Committee until 14th December, 1916.

Apart from the question of the loss of interest on capital when sites are acquired any considerable time in advance of their use for Commonwealth purposes, it is considered most inadvisable that the Committee should run the risk of being in any way influenced in its decision as to the erection of any building by the fact that an expensive site has already been acquired by the Commonwealth for such building.

In most cases there should be little difficulty in obtaining an option over any site suggested for a building forming the subject of reference to the Committee, and, in any case, the Commonwealth is amply protected by the provisions of the *Lands Acquisition Act 1906* from any unreasonable demands which might be made in respect of land required for Commonwealth purposes.

In the opinion of the Committee, however, it is quite as important that full inquiries should be made and Parliament duly informed of any large expenditure on land, as it is in the case of works, and it is strongly recommended that in the case of any proposal for the acquisition of land for Commonwealth purposes, where the estimated cost of the land would exceed £25,000, or the estimated cost of a site for a building plus the cost of the building proposed to be erected thereon would exceed £25,000, the matter should be referred to the Parliamentary Standing Committee on Public Works for investigation and report prior to acquisition.

ORDNANCE AND MOBILIZATION STORES.

19. The proposed Ordnance and Mobilization Store buildings are of similar type to those approved for Seymour, Victoria, and being erected at Liverpool, New South Wales, and, in the opinion of the Committee, are suitable. To avoid the risk of deterioration of the valuable materials to be housed in the Ordnance Store, however, the Committee considers that, in a climate such as that of Midland Junction, it would be an economy if the building were lined throughout, and recommends accordingly. Evidence was also obtained that in the case of waterproof sheets and other rubber goods additional precautions should be taken to guard them from the effects of light and heat, and the Committee is of opinion that a space of approximately 16 feet by 25 feet should be set apart for the storage of such materials. It is considered that this could be easily and economically effected by inclosing with a partition of wood, or other non-conducting material, one of the central bays adjoining the brick dividing wall.

20. Both these stores are proposed to be raised about 3 feet above the ground level, and to avoid the risk of damage or fire from persons going underneath the stores, or rubbish accumulating there, the Committee considers that the space beneath the stores should be inclosed with pig netting, or, if that be not available, with jarrah battens.

VEHICLE STORE.

21. The Committee was not convinced of the necessity for having the walls of the Vehicle Store 11 feet high, when the majority of the vehicles to be stored therein are considerably less than that height. It was ascertained that the largest vehicles likely to be housed are ambulance waggons, which are about 9 ft. 6 in. high with hood erected, and 7 ft. 9 in. high with hood lowered, and under the circumstances the Committee considers an economy could be effected in the building by reducing the height of the walls to 10 feet, and recommends accordingly.

22. In the course of the evidence it was learned that vehicles are only taken from the Vehicle Store at very infrequent intervals. In view of this fact, and of the present high price of bricks and cement, the Committee considers that it is unnecessary to lay a brick floor in this store as proposed, and that economy can be effected by the provision of some other class of floor. It is considered that gravel, well rolled, would be suitable. If found unsatisfactory, it could be covered with bricks at some future time at probably considerably less cost than at present.

AMMUNITION STORE.

23. Careful consideration was given to the question of the Ammunition Store. The plan showed a platform 3 ft. 3 in. wide on the western or railway side of the building, and the roof projecting 9 ft. 3 in., to provide shelter and insure that the ammunition could be transferred from the train to the store wholly under cover. The narrow platform and the wide roof have the effect of bringing the funnel of a railway engine passing the store on the siding immediately below the edge of the double roof. To protect the building from sparks from the engine, the Committee is of opinion that the width of the platform should be increased to 9 ft. 3 in. to equal the roof projection, and that at the same time the height of the building should be reduced 18 inches by fixing the floor level of the building at 2 feet above the ground instead of 3 ft. 6 in. as originally intended. It is further suggested that a more efficient use of the land acquired might be made if the Ammunition Store were placed south of the Mobilization Store, instead of between the Mobilization and Ordnance Stores as now proposed.

SPRINKLERS.

24. In view of the fact that it is intended to store in these buildings material to the value of approximately £300,000, and that the policy of the Commonwealth is not to insure its property, the Committee considers that it would be advisable to instal fire sprinklers in the Ordnance, Mobilization, and Ammunition Stores to assist in coping with any possible outbreak of fire. Some difference of opinion existed as to the necessity of having an installation in the Ammunition Store, as it was argued that the only inflammable part of the building is the roof, against which sprinklers would be ineffective if it caught fire. However, in view of the small cost involved, and the fact that sprinklers are always considered an effective first line of defence against fire in its initial stages, the majority of the Committee was of opinion that the installation should be recommended.

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

Mr. Gregory moved—That fire sprinklers be installed in the Ordnance, Mobilization, and Ammunition Stores.
Seconded by Senator Plain.

Senator Newland moved, as an amendment—That sprinklers be not installed in the Ammunition Store.
Seconded by Mr. Moloney.

The Committee divided on the amendment—

Ayes (2).

Mr. Moloney
Senator Newland.

Noes (6).

Mr. Atkinson
Senator Foll
Mr. Gregory
Mr. Mackay
Mr. Mathews
Senator Plain.

And so it passed in the negative.

The Committee then divided on the original motion—

Ayes (7).

Mr. Atkinson
Senator Foll
Mr. Gregory
Mr. Mackay
Mr. Moloney
Senator Newland
Senator Plain.

No (1).

Mr. Mathews.

And so it was resolved in the affirmative.

ACCOMMODATION FOR ARMOURERS.

25. Consideration was given to the work performed by the Armourer's staff, and to the suggestion that accommodation for all the activities of that staff should be made available in one end of the Ordnance Store. Having inspected the Armourers' workshops at Perth and Melbourne, and carefully sifted the evidence obtained relating to this activity, the Committee is not prepared to approve of this request, and recommends that, to avoid risk of fire and any possible damage to the goods housed in the Ordnance Store, no browning, drying, or forge work be permitted in the Ordnance Store building, and that provision be made for all such work to be carried out in a general workshop.

STORAGE OF OIL, PAINT, AND PETROL.

26. No provision appears to have been made for the storage of oil, paint, and petrol, and the Committee recommends that separate accommodation, apart from the Ordnance Store, be provided (a) for oil and paint, and (b) for petrol.

LUNCHEON AND CHANGING ROOMS.

27. The Committee ascertained that no provision has been made for a luncheon room or lavatory for the men to be employed on this area, and recommends that accommodation should be provided for the men to wash, change their clothes, and have lockers. A room should also be provided where meals could be taken in comfort, where conveniences for boiling water, &c., could be provided, and where the men could enjoy their after-dinner smoke. These provisions would minimize the chances of smoking taking place in the Stores with consequent danger of fire, and would prevent fragments of food being left about the Store to attract rats and mice, and thus be the cause of damage to clothing and other textile stores. The Committee, therefore, unanimously recommends that provision be included for a luncheon room for the staff, and for a luncheon and changing room for the men to be employed in the Stores.

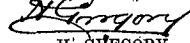
CONCENTRATION AT MIDLAND JUNCTION.

28. The housing of stores in various buildings in Perth is obviously inconvenient and expensive, and it was stated in evidence that it is necessary to maintain a staff at each place. The concentration of the whole of the Ordnance Store business at Midland Junction, which the Committee considers of paramount importance, besides making for greater convenience, increased facilities for administration, more efficient supervision, economy of distribution, less handling of goods, and greater security against losses from fire and other causes, should permit of a saving in personnel. The Committee is, therefore, of opinion that the whole of the Ordnance business, together with the staff—clerical, armourers, artisans, &c.—should be concentrated at Midland Junction.

SUMMARY OF COMMITTEE'S RECOMMENDATIONS.

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

- (i) that the erection of the buildings proposed, with the exception of the Caretaker's Cottage, be proceeded with;
- (ii) that an additional area of about 7 acres to the north of the site be acquired, as set out in paragraph 17 of the report, and that the cottage thereon be utilized as caretaker's quarters;
- (iii) that the Ordnance Store be lined throughout, and that a space of approximately 16 feet by 25 feet therein be partitioned off for the storage of waterproof sheets, &c.;
- (iv) that where any space occurs between the ground and the floor level of the Ordnance or Mobilization Stores, action be taken to inclose same with pig netting or jarrah battens;
- (v) that the height of the walls of the Vehicle Store be reduced to 10 feet;
- (vi) that the floor of the Vehicle Store be formed of gravel;
- (vii) that the Ammunition Store be located to the south of the Mobilization Store; that the railway platform to that building be widened to 9 ft. 3 in., and that the floor be dropped 18 inches;
- (viii) that fire sprinklers be installed in the Ordnance, Mobilization, and Ammunition Stores;
- (ix) that no browning, drying, or forge work for armourers be permitted in the Ordnance Store, and that all such work be carried out in a general workshop;
- (x) that accommodation for the storage of oil and paint and for petrol be provided apart from the Ordnance Store;
- (xi) that a luncheon room be provided for the staff, and a luncheon and changing room for the men employed in the Stores;
- (xii) that the whole of the Ordnance staff—clerical, armourers, artisans, &c.—be concentrated at Midland Junction.


H. GREGORY,
Chairman.

Office of the Parliamentary Standing Committee on Public Works,
527 Collins-street, Melbourne, 24th August, 1920.

VEHICLE STORES, MIDLAND JUNCTION, W.A.

MINUTES OF EVIDENCE

(Taken at Melbourne.)

TUESDAY, 13th JULY, 1920.

Present:

Mr. GREGORY, Chairman;

Senator Henderson, Mr. Mackay,
Mr. Atkinson, Mr. Mathews,
Mr. Bamford,

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

1. *To the Chairman.*—The proposal which has been submitted to the Committee is for the erection of Mobilization and Ordnance Stores at Midland Junction, near Perth. The proposed buildings are: One ordnance store, 306 feet x 100 feet; one equipment store, 153 feet x 80 feet; a small-arms ammunition store, 60 feet x 40 feet; a vehicle store, 300 feet x 100 feet; an office, 49 feet x 20 feet; and a caretaker's cottage. It is proposed that the buildings generally shall be similar in design to those being erected at Seymour. Provision is being made to allow of the extension of the buildings to practically double the initial size. Such an extension may or may not be necessary, but the buildings which we propose to erect now are urgently necessary. The main store, 306 feet x 100 feet, is partly required for the accommodation of ordnance stores which are at present kept in a rented building in Hay-street, Perth. The rent of that building is £10 per week, and the lease expires on the 15th November of this year. Temporary accommodation could be found for the stores by distributing them through various buildings, but this is undesirable, and unless the proposed new buildings are erected before the Hay-street lease expires there will be considerable cost for double handling and watchman's services. The new stores are required partly for mobilization and partly for ordnance purposes. The material which is to arrive from England, will be stored in the equipment store, measuring 153 feet x 80 feet. The details of the estimated cost, as submitted to us by the Western Australian Department of Works, are as follows:—Excavation and levelling of site, £1,335; railway siding, £1,850; ordnance store, £10,400; equipment store, £5,432; small-arms ammunition store, £8,658; vehicle store, £7,487; office, £458; caretaker's cottage, £960; lighting, water supply facilities, drainage, and contingencies, £2,687; total, £34,267. The site selected is three-quarters of a mile from Midland Junction railway station, 2 miles from Blackboy Camp, and slightly over 1 mile from Midland Junction rifle range, which is used by the troops at Blackboy Camp. The site comprises a strip of land 230 feet wide, containing 22 acres 39 perches, alongside the Darling Range branch railway. That line is not very

much used, but the site is near the Midland Junction railway yards, and the stores would naturally be worked from those yards by shunting engines. It is easy of access by means of a loopline and siding from the branch line. The selection of the site was governed by several considerations. The Military Board laid down the principle that the site should be in the vicinity of the Blackboy Camp. I think the main consideration was the fact that Blackboy Camp was already established, and would be used in future as the mobilization centre. It was considered necessary, also, that the stores should be on the left bank of the Swan River, so that if anything happened to the bridges across the river the stores would still have access to the main railway system. Several sites were considered. Blackboy Camp was one of them; it is on the main Midland line, but is not a suitable place for stores. The grade of the railway into the camp is 1 in 50, and the excavation required in order to erect stores there would be very considerable. Another site suggested by the District officers is on the Midland line, about a mile from the Midland Junction railway station. It is a good building site, but it is awkward to connect by a railway siding, owing to the fact that it consists of a long, narrow strip running away from the main railway, and in getting access for a siding half of the area would be wasted. A further objection is that the Midland line is privately owned; it was thought preferable that the stores should be alongside a Government line. Another site was the Midland Junction rifle range, which is Commonwealth land, but the area there is limited, and it is about 1½ miles from the Midland Junction station. The site selected has an advantage over all others, inasmuch as it is within 2 miles of Blackboy Camp, is on the route between the camp and Midland Junction rifle range, and is closer than any other to the Midland Junction station. The main store will be used for ordnance purposes, and it was thought desirable that it should be as close as possible to the Midland Junction station in order to facilitate the delivery of small parcels. One other site had all the advantages of that selected, but it belongs to the Railways Commissioners, who would not agree to allow the Commonwealth to use it. It is rather an advantage to have the siding on a loop from a branch line which does not carry a great deal of traffic. The area of the selected site is sufficient for our purposes. It is not proposed to erect field artillery stores there. Such stores require a fairly large danger zone, and the Department has land at Guildford Remount Depot, 3 miles by road from this site, on which a certain amount of accommodation for this purpose already exists, whilst there is plenty of area to increase the accommodation as much as may be required without interfering with the use of the ground as a Remount Depot.

2. *To Mr. Mathews*—We have not yet gone thoroughly into the question of providing a store for field artillery ammunition, but I believe that it will be necessary to erect a store 60 feet x 80 feet at the Guildford Depot. There is no possibility of railway connexion with that area, but that is not considered necessary for the handling of field artillery ammunition.

3. *To the Chairman*—The area at Guildford is about 170 to 180 acres. The selected site for the ordnance stores is practically level, where the buildings are to be erected, and will require only surface formation; thence it dips towards the bed of the Helena River. The proposed ordnance store will be similar in design to that adopted for Seymour. It is proposed to build it of Western Australian timber. The ordnance and mobilization stores will be on the same site. The ammunition store is to be near the ordnance and equipment stores, but there is no danger of explosion in connexion with small-arms ammunition. In the event of fire, there would be some danger to the fremen, owing to the cartridges being set off one by one, but this ammunition does not explode. I have considered the risk of fire, and am quite satisfied that the ammunition stores should be placed as we have planned. The ammunition store will be of brick, and it will not be surrounded by dumps. The height of the vehicle store will be the same as that adopted for similar buildings at Seymour. It will be necessary to fence the site at Midland Junction just as we propose to do at Seymour, but no item for fencing has been set down. The recommended site is between 15 and 16 miles from the seaboard. I think it is an advantage to have ordnance stores close to a large store like Midland Junction. I do not regard these stores as likely to develop to anything like the same size as those that are being erected in Victoria. We are proposing to erect only one vehicle store 300 feet x 100 feet, and I do not expect we shall ever require more than double that accommodation. In choosing the site the strategic considerations were given due weight by the Military Board. It is about 10 miles from Perth. I know that Broadmeadows was considered to be too close to Melbourne to be adopted as a mobilization camp. It is practically only the same distance from Melbourne to Broadmeadows as from Perth to Midland Junction, but it must be remembered that Melbourne city extends almost to Broadmeadows, whereas there is a considerable gap between Perth and Midland Junction. In order to choose a site further inland, as, for instance, on the Eastern Gold-fields line, it would have been necessary to go a considerable further distance from Perth, but acting on the general directions given to me by the Military Board, I investigated only sites in the vicinity of Blackboy Camp. I do not consider that Midland Junction is too far distant from Perth for ordnance store purposes. It would be necessary to convey all material from the ordnance stores to Blackboy Camp by vehicle. It is difficult to get a railway siding into the camp, but 2 miles is not too great a distance to cart store by road. I have not heard of pilfering having taken place in connexion with the carting of goods by road into the training camps. The advantage of delivery by vehicle is that the goods can be dumped in any portion of the camp as they are required. Even when a siding is taken into a camp, the material has to be distributed from the railway by vehicle to different parts of the camp. I do not think there will be much risk of pilfering in the cartage of goods a mere 2 miles. There is a fair roadway to Blackboy Camp, to Midland Junction township, and to the rifle range. I do not think any consideration has been given to the advisability of constructing the buildings that they may be moved to another site, but being built of timber, they will be movable easily enough.

4. *To Mr. Mackay*—The site selected is high and dry, and has good drainage. The buildings will stand on land about 30 feet above the bed of the Helena River, which runs along the south end of the site. Perth is about 6 miles from the seaboard, and the proposed buildings will be 10 miles from Perth.

5. *To Mr. Bamford*—The lease of the Hay-street building dates from 1916, and expires in November next. Anticipating no difficulty in getting these stores erected in ample time, we promised the Western Australian Government early this year to vacate the building in Hay-street before November, as it is required for exhibition purposes. I admit that we have left the construction of these buildings rather late, but the main reason is that the Works Department of Western Australia took about three months to give us an estimate of the cost.

6. *To Mr. Mathews*—The Military Board, after hearing the views of General White, decided that the site of the stores should be in the vicinity of Blackboy Camp. The site was chosen from a mobilization standpoint. I do not consider it too close to the city of Perth, although I did consider that Broadmeadows was too close to Melbourne. Perth is not so large a city as Melbourne, and is more effectively separated from the camp, although the distance in miles is about the same. The Military Board considered it essential that the site of the stores should be on the south side of the Swan River. Blackboy is the principal military camp in Western Australia. It was first used in 1914. Prior to that the military encampments had been in various places, but there was no permanent site, except one at Tammin, about half way between Perth and Kalgoorlie; that site was found quite unsuitable.

7. *To Mr. Atkinson*—I am not acquainted with any other suitable sites in Western Australia for ordnance stores. I made a brief visit to the State, and, in accordance with my instructions, confined my investigations to the vicinity of Blackboy Camp. I was also impressed with the desirability of having the stores as close as possible to Midland Junction, from which all the main railways radiate. The Military Board had previously decided on Blackboy as the concentration camp for the Western Australian district.

8. *To the Chairman*—The site was selected mainly for mobilization purposes. Subsequently the Military Board decided to place the ordnance stores there also. Blackboy Camp comprises approximately 100 acres. In my opinion, an ordnance store should be right in the city, but strategic considerations had some weight in the decision to place the ordnance store at Midland Junction. Another site, at Maylands, within about 2 miles of Perth, was under consideration, but the Military Board considered it too close to the seaboard for ordnance stores. If we had to go beyond Maylands, we might just as well go as close as possible to Midland Junction. If that point is conceded, the site chosen is the best that could be selected for ordnance stores. By means of a railway siding it will be in direct communication with every part of the Western Australian railway system, so that, except in regard to deliveries in Perth, it will be just as suitable as any site in the city. Another advantage is that Midland Junction is developing into a manufacturing centre, and the stores may be able to get some of their material on the spot. The extent to which ordnance stores will be distributed in Perth will be determined by the decision of Parliament in regard to future military training. Certainly much of the material will have to be sent from Perth to Midland Junction, and thence returned to Perth for distribution about the city and suburbs. There are facilities at Midland Junction for delivery, inwards and outwards, by both road and rail. I do not think the de-

livery is over likely to be sufficiently large to warrant the use of water carriage, so that point was never considered. I have not considered what would be the cost of distribution from Midland Junction in comparison with that from Perth. Galvanized-iron buildings will be quite suitable for ordnance purposes. We have not yet decided to install sprinklers in these stores, but in view of the Committee's decision in regard to Seymour, that will very likely be done. If Blackboy ceases to be the main concentration camp for Western Australia, the buildings erected at Midland Junction would still be quite suitable for ordnance stores. By having the mobilization and ordnance stores on the one site we shall reduce the cost of caretaking. If Perth expands to such an extent as to make it imperative that the concentration camp should be removed further away, it is quite likely that the whole of the buildings to be erected at Midland Junction would continue in use for ordnance purposes.

9. *To Mr. Atkinson*—The Midland Junction rifle range, which is owned by the Commonwealth, comprises about 300 acres. It is about 2 miles distant from the camp. An artillery range will not be required there.

10. *To the Chairman*—Even if the artillery ammunition were stored on the same site as the small arms ammunition and the ordnance and mobilization stores, a special caretaker for the artillery ammunition would be required, because he must be a man possessing a knowledge of magazine conditions.

The witness withdrew.

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

11. *To the Chairman*—I am aware that a reference has been submitted to the Committee in connexion with mobilization and vehicle stores in Western Australia. The estimated cost of these stores is £34,261, including the preparation of the site, ordinary fencing, and so forth. As to urgency, the stores, in addition to the ordnance stores we are at present occupying in Perth, are the Exhibition Building, in Hay-street, which represents 21,000 odd square feet. We also have stores in the drill sheds of about 3,500 square feet, and stores at Karrakatta of 6,000 or 7,000 square feet. We have been informed by the owners of the Exhibition Building that we must vacate it by the 15th November; and that means we must be out at least a fortnight before that date, or have a store available by then, in order to give us time to stuff. I am definitely informed that there is no possibility of an extension of the lease, and it is necessary that new ordnance stores should be obtained immediately. I cannot say how long it is since we obtained notice to leave. I think we had hopes of an extension, but I cannot remember to what date. We are advised that there is no possibility of obtaining any other stores, although all inquiries have been made. I do not know why the owners require possession of the Exhibition Building. It is essential that there should be a railway siding to any permanent stores, and also good road facilities. A good deal of stuff is delivered under contract by motor lorry or cart, as well as by rail. Particularly in war time it is essential that a good portion of the stores should be delivered by rail. At such a time the ordnance stores would have to receive and make delivery, and the mobilization stores could then be converted to that purpose. It is absolutely necessary to have a railway siding to mobilization stores and ordnance stores. In peace time, with regard to ordnance stores, it would be all right if there were no railway, but

there should be facilities for running a line to the stores. For instance, in Melbourne, the stores are not on a railway, and I am informed that the cost of cartage to Spencer-street is prodigious. We have many concrete, and some of the stores come in drabets by road. As to the distance of the site from the city, in peace time, for an ordnance store, a site in the city has the advantage of being easy of access to contractors, and it is also of advantage in the issuing of supplies to the troops at their home station head-quarters. In many instances the supply of clothing, and things like that, would be sufficient to fill a truck for a railway siding; but if the stores were in town it might be more convenient to run smaller loads. The expense of taking stores from the manufacturer to the railway station in Perth, and subsequently carting it out at Midland Junction, would, of course, be a disadvantage. I understand that, from a strategic point of view, it is considered unwise to have the ordnance store in Perth. General White thinks it better to have a site a little bit out, and we must remember that Midland Junction is becoming a manufacturing centre, which is a great factor in its favour. The proposed ordnance store of 300 feet by 100 feet, representing a floor space of 30,000 square feet, will give ample accommodation for present requirements, with a bit to spare; there is room for expansion if necessary. The area of land selected for the stores is 12 acres. At Seymour the accommodation was for mobilization alone, whereas at Midland Junction we have decided to have the mobilization stores also adjacent to the other stores. The Defence Department has come to a definite understanding that Blackboy Hill should be the permanent camp for Western Australia. It is not considered that that camp is too close to the city. If a larger area is required in the future we have an overflow into the rifle range—some 700 odd acres—if the space be wanted. This land could be utilized for training purposes. I do not know from my own knowledge whether, in course of training at Blackboy Camp, it has been necessary to go on to private property, but I should say that would be so. The Blackboy Hill Camp represents some 60 or 70 acres. In addition, there is the artillery camp at Guildford, of about 200 acres. I cannot speak as to Karrakatta, for I do not know the place. At the site selected there will be facilities for sending ordnance stores by rail to every part of Western Australia; and from my point of view it is, perhaps, the best place. The greater portion of the ordnance supplies will come into the city if the system of home training is continued; and I expect that is a difficulty. If the new method of training wholly in camp is adopted there will not be so much distribution of ordnance stores to units at head-quarters, but more at the camps. Clothing, and that sort of thing, will always have to be given at the unit centre if home training is continued, so that the men may get ready for camp, but we are hopeful that the training will not be what we call "home" training. As I say, most of the stuff will go to Perth; but if the system is altered, though some would still go to Perth, the bulk would not. Again, we will draw on our mobilization stores very often for training equipment. I know that Broadmeadows, from the point of view of mobilization, was not accepted because of the larger area at Seymour, but that was on account of the training. I still say that the mobilization stores, and the central training camp, must be together. Under the proposed new arrangement, the only means of communication between the mobilization and ordnance stores and the camp would be by road. Most of the stores utilized in camp will be taken there by the troops themselves. I do not know that, when the camps are on, there are many losses in the case of goods

carried by cart or lorry; there ought not to be much chance of pilfering, because, as I say, the units draw their own mobilization stores. However, people who wish to steal will steal anywhere at any time. These stores in Western Australia will be approximately 15 miles from the sea in a direct line. It is a moot question whether it is wise to have a training camp adjacent to a large city or town. There was a strong objection to the troops training at Broadmeadows, because they came into Melbourne and got into trouble. When they went to Seymour strong objection was still raised, because the troops were dissatisfied. They were about to depart for the Front, and could not get into town to see their friends. One objection balances the other. In Egypt it was a great drawback to have the men in camp so near a wicked place like Cairo, but, on the other hand, from the point of view of morale, if they had been taken into the desert they would have become discontented—bored stiff. These questions can be argued from two points of view. In the case of war in Australia, however, if the men were mobilized at Seymour their "cars would be back," they would be in a very different mood from men who were waiting in their own country to be sent to the seat of war abroad. Under such circumstances at Seymour they would be practically in the field, not at home waiting to go away. I think that the space of 30,000 square feet for these stores is ample, especially in view of the fact that that space could easily be doubled; the buildings are not difficult ones. If we wanted more space for ordnance we should have to find another place for our mobilization stores. There is a tremendous lot of vacant land about this site, but it might be snatched up in view of the development which may be expected in Western Australia. Regarding Fremantle as one of the principal naval bases of Australia, there is ample room for mobilization and equipment stores in view of the number of troops we have. This area will lend itself to future development for some time. The space between the equipment store and the vehicle store is small as compared with that at Seymour, but at Seymour room had to be left for the troops to come and get their stores, whereas the room is ample for this purpose at Midland Junction. I think that with the possibilities of expansion there is ample space for a long time to come.

12. *To Mr. Atkinson.*—I have passed this site in a motor, but I have no definite recollection of it. The Department has not made any attempt to see if it can get land beyond Blackboy, but it has tried to get land about there. When I was over there is was fully understood that Blackboy camp had been settled on as the most suitable. When I looked at it, however, along with the engineers, I pointed out that they could not put up buildings or railways without a very deep excavation of 8 or 9 feet; and that was impracticable. We had not time to search for another site, but the Commandant was left with instructions to discover one, and we suggested that a good place might be found about Midland Junction. He picked a site on the Midland line, which is a private line that runs north. He submitted his plans, and when the plans were gone into by the Director of Works, and the place inspected, it was discovered that it was not a good place, because, in order to get a railway siding with the necessary safety curve, it was necessary to be well on the ground before there was a straight run. That site was ruled out, and Colonel Murdoch went over and helped to find the present site. I do not think that the Department inspected any site at Guildford with a view to putting in ordnance or mobilization stores there. I went to Guildford with the view of considering the question of erecting further field artillery magazines. Again, I

saw that site only in passing, but it was off the railway line with soft ground in between. The proposition then was to put up extra magazines on the rifle range. I was told to-day by Colonel Murdoch that they are considering the question of putting these up at Guildford for artillery; it is only a couple of miles off rail. That site was not considered from an ordnance point of view, or, at any rate, it was ruled out. I would like to see more ground at Blackboy, but there is a pretty big area at the rifle range. There is private ground in between, but the two pieces of Government land are not very far apart. The Blackboy land just about reaches the foot of the hills. I do not know whether the Department inspected any other parts of Western Australia with a view to finding a site for the permanent camp. Blackboy has been the standing camp for a long while. I am satisfied that the Department has not gone 50 or 60 miles further to look for a site. I do not think that the Department has inspected other parts of Western Australia in order to see if there is a better place than Blackboy.

13. *To Mr. Bamford.*—As to the urgency of these stores, and the delay in referring the matter to the Committee, the notice to quit our present building has made the ordnance stores an urgent matter, and prior to that notice being given the mobilization stores themselves were not estimated to cost a sufficient amount of money to make a reference to the Committee necessary for them alone. The circumstances have made the matter urgent. We were looking for a site for a mobilization store in December last.

14. *To Senator Henderson.*—Accessibility to the site is always one of the greatest considerations.

15. *To Mr. Mathews.*—This site was selected after consultation with General White and others of experience in strategy and tactics. There was at first a suggestion made that the stores should be at Marylands, but General White was dead against that; he wanted the ordnance stores out of town. I think the site selected for the dual purpose will do for twenty years, at any rate. Personally, I am satisfied that it is not too near the centre of population for the purposes of an ordinary concentration camp. Its disadvantages are balanced by its advantages in this regard.

16. *To Mr. Mackay.*—Some of the equipment from Europe has arrived in Western Australia—some wagons and machine guns—and they are in the stores now together with a quantity of normal stores. The buildings to be erected will be sufficient to accommodate the stores that have arrived, and those which are to arrive, with some room to spare. The ordnance store will be pretty well filled up.

17. *To the Chairman.*—I believe in fencing the area, and I think that barbed wire and posts, the same as at Seymour, will be sufficient. A water supply will be required for fire purposes and for the supply of the clerks and employees, and I have been told that an ample one can be provided from the main for about £500 odd. I cannot remember the number of people who were employed at these stores. The caretaker, for whom a cottage is provided, will be merely a caretaker. I do not think that anything has been arranged on the plan with regard to the supply of hot water, and so forth, for the use of the employees. There is an office 40 feet by 20 feet. The men employed will reside at Midland Junction, which is a centre of population, or in Perth. The question of sanitation has been taken into consideration. I do not think there is a drainage system, and the sanitation is estimated to cost about £700. I certainly think that some provision should be made in the shape of a room for the employees, in which they may have their lunches, and so forth, and I am rather surprised that such an arrangement has not been

made, for it is quite common in all big business houses now. The workshop will eventually be about 60 feet from the stores. The proximity of the workshop will not, I think, give rise to a great deal of danger from fire while the people are there working. Of course, fires very often happen at night, possibly through some person throwing away a cigarette, but that might occur, not in the workshop, but in the stores themselves. The workshop is for the purpose of doing repairs to goods damaged in camp. I have not thought of moving the armourers from Perth; but I know that they are provided for at Leichhardt. The position is altered in the present case by the fact that the mobilization stores are on the site. I should like to see twice as much as 12 acres of ground available. If the area were square, instead of a long narrow strip, it would be infinitely better. The price paid for the land was only £600, and I am informed that it has been acquired by the Government. I should say it would be a good thing to get an additional block immediately on the other side of the railway line.

18. *To Mr. Mathews.*—The ordnance stores in Perth are on Government-owned land, close alongside the Headquarters Offices.

(Taken at Melbourne.)

WEDNESDAY, 14TH JULY, 1920.

Present:

Mr. Gibson, Chairman.

Senator Henderson, Mr. Mackay,
Mr. Atkinson, Mr. Mathews,
Mr. Bamford,
Percy Thomas Owen, Director General of Works,
Department of Works and Railways, sworn and examined.

19. *To the Chairman.*—I am aware that the question of erecting mobilization and vehicle stores at Midland Junction, Western Australia, has been submitted to your Committee for investigation and report. The proposal is to lay down the first portion of a depot or store for A.I.F. equipment and vehicles, and also a munition store, caretaker's quarters, a workshop, and certain accessories. The site selected is south-east of Midland Junction, on the Canning Hills railway. The position on which the proposed stores are to be erected has been selected by the Defence Department in the same way as the sites at Seymour and at Liverpool, being adjacent to the proposed site for the mobilization of Western Australian troops. I have not had an opportunity of personally inspecting the site, but I understand that it is suitable as regards contour, and that there is no difficulty in the matter of drainage. Generally speaking, I believe, it is in every way suitable, but I can only express that opinion on hearsay information. The proposed buildings comprise an ordnance store, 306 feet by 100 feet, of the same type as that to be constructed at Seymour. The equipment store is of similar type to a size of 306 feet by 100 feet. Provision has been made for one vehicle shed, 300 feet by 100 feet, which is also of the same type as that proposed for Seymour. The site affords room for an additional vehicle shed, 300 feet by 100 feet. Provision has also been made for a small ammunition store, 60 feet by 80 feet, and a workshop—which is not included in the present reference to the Committee—the dimensions of which are 100 feet by 35 feet.

According to the plan before me, the dimensions of the workshop are shown as 100 feet by 60 feet, but these should, I think, be 100 feet by 35 feet. Provision has also been made for caretaker's quarters, which is included in the reference to the Committee, and an office, 40 feet by 20 feet. I note in the statement supplied to the Committee that, although the total £34,267 is correct, a typographical error has occurred in connexion with the estimated cost of the caretaker's cottage, which should be £900. The aggregate remains the same, subject to the modification I shall submit to the Committee to-day. The accessories, which are a part of the scheme, include a road, water supply, fire service, drainage, lighting for the ordnance equipment and ammunition stores, and caretaker's quarters and office. I also propose to submit an item to provide for sprinklers to be used in case of fire, which is not included in the original estimate. These sprinklers would be installed in the ordnance, ammunition, and equipment stores. The item "H" for £2,687 on the schedule submitted to the Committee will need modification. That estimate was prepared in Western Australia, and submitted to my Department, but in going into the matter we have found that the amount required for a fire service, roadway, drainage, fencing and lighting would be approximately £3,372. That includes bringing in the water, but the sprinkler service will mean an additional £2,280, therefore the total will be £5,652 instead of £2,687. Other accessory works include a siding from existing railway, excavations and levelling of site. I cannot inform the Committee definitely in connexion with this matter as I have not had an opportunity of making a personal inspection, but from information received it would appear that the site is quite satisfactory for the purpose. For the information of the Committee, I produce a map of a portion of the State of Western Australia, showing the relative positions of Perth and Midland Junction, and the railway which joins up in the vicinity of the latter. I also produce a map showing the location of the water main for Perth, and a plan showing the Midland Junction railway workshops and depot, and the location of the proposed site in relation to the depot. It is proposed that the construction of the building should be the same as recommended for the equipment, ordnance and vehicle stores at Seymour. In Western Australia, however, we do not anticipate any disabilities regarding the supply of timber, as were felt in Victoria, and the Department is desirous of utilizing jarrah and karri. Jarrah can be used for all lower members, such as posts, and karri for roof construction. It is proposed to roof the buildings with iron, and if possible all joinery work, including doors, will be made of jarrah or karri. I regret that my Department has not yet received the working drawings from the Department of Public Works in Western Australia, and we have therefore been able to submit to the Committee only the types. If the Committee so desire, these drawings can be obtained; in fact, they have been telegraphed for. If the Committee propose to take evidence in Western Australia Mr. Hardwick, the Chief Architect, will be able to submit full information. The drawings for which we have wired will in any case come forward, and will be forwarded to the Committee for consideration. I expect these to come to hand within the course of a day or two. We propose to take the water supply from the main which is not far distant from the supply from the main which is not far distant from the eastern railway. We have allowed for that connection and for water distribution on the same lines as at Seymour. I am not sure of the size of the main to Perth, but understand there will be no difficulty in obtaining the necessary water supply. A 4-in. cast-iron pipe is proposed for a branch service, and ten hydrants will

be erected, as shown on the plan I am leaving with the Committee. In connexion with the sprinkler system it is proposed to construct a 10,000-gallon steel or iron tank on a steel stand with piping exterior to the buildings. Sprinklers will be installed in each of the stores. My Department has not the exact knowledge as to the location of the electric light main, but a sun has been allowed tentatively for the connexion. It is proposed to put lighting points in the ordnance store, the caretaker's quarters, and the office. The branch line, to which I have referred, is of the same gauge as the main line. My Department has not exact knowledge regarding the supply of gravel, but provision has been made for a metal and gravel roadway 18 feet in width. The water from the roofs will be carried by 9-in. stone-wear pipes to a swamp at the south-western end of the site. It is proposed to enclose the area with a fence, comprising five barbed wires, the top wire of which will be 4 feet from the ground. The area of the land is approximately 12 acres 39 perches. The length is approximately 2,200 feet and the width 220 feet. I understand that it has been stated by some witnesses that the stores should be contiguous to the training camp. I do not know the exact location of the Blackboy Camp, but I understand it is approximately 2 miles distant. I was associated with the work in connexion with the ordnance store at Leichhardt, and I was given to understand that one of the essential features was that a site should be selected which provided railway facilities, an efficient water supply, and a good road. As to whether the proposed site is suitable from an ordnance point of view, I would suggest that that is more a matter for the Defence Department. I understand that in Queensland, for instance, this question has been before the Defence Department, and there is a tendency to endeavour to get the ordnance stores closer to the buildings or depots to which equipment is regularly distributed. The delivery of goods by suppliers must also be considered. If the site of the proposed stores is not more than 10 miles from the manufacturing centres a good road would be essential, as such a facility would render motor transport convenient and profitable. I have been asked whether an ordnance store constructed of wood and galvanized iron would be sufficiently durable, and I may say that I consider a structure of good sound timber and galvanized iron quite satisfactory. The buildings proposed are only a single story, but if they were to be of more than one story I would recommend brick or concrete. I find that the work at Brigadier-General Forsyth stated that if the work at Seymour developed he would prefer buildings of two or three stories instead of a number of single-story structures scattered all over the place. If the buildings were to be of more than one story I would closely consider the question of erecting them of concrete or brick. An alternative would be to erect them of timber in such a way that they would not burn freely. For instance, the floor joists instead of being placed fairly close together could be situated two or three feet apart, and if the timber was of a heavy nature the fire risks would be considerably reduced. The layout plans of the proposed buildings were prepared by the Defence Department, and were intended to meet the present and future requirements. We have not been given any information concerning the kind of equipment to be stored or any other particulars, other than those conveyed by the plans. I also understand that it is the desire of the Department to establish a workshop, as is shown on the plan, but I cannot imagine that that building is required for other than minor repairs. If it has been contended that the armourers and mechanics generally should be employed near the ordnance stores it must be simply as a convenience in

connexion with repair work. According to the plan, the width of the siding ordnance store and platform would be 192 feet.

20. *To Mr. Bamford*.—I do not know whether it would be desirable to alter the site of some of the proposed buildings, and I certainly do not think it would be possible to extend them in a southerly direction, as the land there falls away quickly to the gravel pit.

21. *To the Chairman*.—I do not know whether the width mentioned provides a sufficient area for the expeditious handling of the material, but I consider that if a larger area could have been acquired it would have been preferable, as it only leaves room for very little development. If there is not sufficient room for future development on the proposed site it would be better to decide at once the type of building to adopt. I do not know the cost of materials at Midland Junction; but if larger floor space is likely to be required either brick or concrete buildings of more than one story will be necessary. The proposed ordnance store will be similar to that to be erected at Seymour, and, apart from the ceiling, it will not be lined. The store at Unswick, in South Australia, is of similar type and is well liked. I believe the climate in Western Australia is similar to that in Adelaide, where the stores have been found quite satisfactory. Such goods as leather and rubber would possibly have to be specially protected. No provision has been shown on the plan for a luncheon room in the office buildings, but I believe the number of men likely to benefit by such a convenience will probably be small. If more than several are likely to require such a convenience it would be preferable to provide such accommodation in order to avoid fire risks. If only a small number are to be convenience, probably accommodation already provided in the office would be utilized.

22. *To Mr. Bamford*.—The 6 in. x 6 in. posts to be used in connexion with the vehicle shed are, I believe, to be bedded in concrete. Owing to the very high cost of cement the question now arises whether it is obligatory to use cement, or whether the posts cannot be put down with soles and struts. Cement is now £2 a barrel, and we are anxious to ascertain whether we cannot put in gravel instead of a cement floor in the vehicle sheds at Seymour. I do not know if there is good gravel available at Midland Junction, but if there is probably it would be advisable to have gravel instead of cement floors.

23. *To Mr. Mackay*.—The land on which the proposed buildings are to be erected is at present vacant, and on the other side there is a large temporary building used for wheat storage purposes, erected on land which is the property of the Railways Commissioners. I could not say whether the Railways Department of Western Australia would be prepared to dispose of a portion of that land if necessary. In the event of both sides of the line being utilized an additional siding would be necessary.

24. *To Mr. Bamford*.—The question of whether it would be inconvenient to have buildings on the other side of the line would largely depend on the traffic going over the railway, but it certainly would not be so convenient as the present proposal.

25. *To Mr. Mackay*.—I have been informed that Brigadier-General Forsyth was not sure whether the grain sheds were on the land to which reference has been made; but Colonel Murdoch, who has inspected the site, says that they are. An additional area could not be secured by extending the width, but I could not say whether the land on the northern end could be ac-

quired. If an additional area was to be secured negotiations would have to be entered into by the Home and Territories Department. The fence surrounding the property at Seymour consists of four barbed wires, whilst the present proposal is for a fence of five barbed wires. This matter has been discussed with Colonel Murdoch, and it has been decided to have an additional wire, which will prevent easy access to the property.

26. *To Mr. Mathews*.—According to the map, the Blackboy Camp is situated on the southern side of the Perth to Kalgoorlie Line, about two miles east of the site under review. The rifle range site commences about three-quarters of a mile to the south on the southern side of the Canning Hill railway. I have been asked whether the magazine in its proposed site will prevent the concentration of buildings. There is space sufficient for a building double the size of the ammunition store. It is not a magazine but a small arms ammunition store. There is a difference between a magazine and an ammunition store; the latter is not a "danger" building. Small arms ammunition goes into an ammunition store, and powder into a magazine, under magazine regulations. I have been asked whether I consider the ammunition store is in a suitable place, and I may say there is not any likelihood of danger, but if the building were extended the area would be fairly restricted. I am not prepared to advise its transfer, because I do not know where it could be placed. There would have been one alternative, according to the plan, and that would be to construct a building 300 feet by 100 feet and start building up. If this were done the A.F. equipment could be placed on a most suitable floor, and the ordnance stores on another floor, with the possibility of extending upwards as the area is so restricted. The cost would be more, and there would also be the difficulty of carrying light 100 feet.

27. *To Mr. Atkinson*.—It has been decided to construct these buildings of wood, and on one floor.

28. *To Mr. Mathews*.—Apart from the ceiling, the buildings are to be unlined. I understand that in Western Australia karri would be used for this purpose, as it is comparatively inexpensive and easily obtainable. In Western Australia they have adopted karri entirely for roof construction, and Oregon is seldom used. As regards the sprinklers suggested, I believe the practice is to have them tested periodically by the company installing them. I do not know whether the cost of inspection is included in the first cost, but if it is not, an amount would have to be set aside for that purpose. I am endeavouring to obtain information from Great Britain and America as to other makes of sprinklers apart from those already in use here. These appliances are, of course, of little use unless they are inspected from time to time; but I understand that the authorities have been repeatedly informed that they have been the means of preventing the spread of fire. I think it would be wise to have such an installation in an ammunition store, as the cost is not excessive. In the event of fires, the water from the sprinklers would dampen the cases of ammunition, and delay them igniting. The cost of such an installation in the magazine store would be about £80. According to the latest information I have received, sprinklers were being used in large army stores in America with satisfactory results.

29. *To the Chairman*.—In regard to the railway siding, I have been reminded that the plan shows a small section giving convenience to the ordnance stores down to the end of the mobilization store, and I have been

asked whether that will provide ample convenience for rapid loading and unloading of stores. What was in my mind when I said an alternative might be considered was a multi-storied building. The site we have is to a large extent absorbed by single-storied structures, but if we had a multi-storied building it would open out 300 feet. Under the proposed scheme the site will provide ample accommodation for the stores; but if the ordnance store buildings were extended another 150 feet it would not be sufficient. If the equipment stores were also extended, the area available would not be too much. I am aware that, in connexion with the Seymour mobilization stores, three lines of railway, extending for a distance beyond the building were provided, and that it was asserted that they could not be reduced. I am also aware that the present proposal provides for a single line from the ordnance to the mobilization store, and I can only account for this by saying that the authorities must anticipate more handling at Seymour than at Midland Junction, though it is not much room for expansion, either in the matter of floor area on the one level, or in the direction of railway handling. I presume the railway siding will be constructed by the Railway Department of Western Australia, and will be subject to the usual conditions. I do not know the size of the leading water main, but I presume it is fairly large. Provision has been made for an overhead tank to supply the sprinklers, but water for fire hoses would come direct from the main. I consider a 4-in. main large enough for supplying the hoses for fire-fighting purposes. The pipe line required to make the necessary connexion would come along Vincent-street to the railway. To obviate the danger arising from fire, there may be some advantage in placing the ammunition store further south, and placing the other buildings in a more northerly direction. Moreover, the ammunition store would not then be between the other two stores, and ammunition could be worked quite independent of the trucks at the store building. I do not, however, wish to express a definite opinion on that matter without an opportunity of further considering the question. If it were possible to have another loop on the western side of the track, I think it would be advantageous. I have always thought an earth or wooden ramp necessary, but at Liverpool it was stated by competent authorities that ramps could be erected whenever necessary when mobilizing. As regards the proposed vehicle stores, the height should be 11 feet, as the vehicles are approximately 9 feet 6 inches. The height of the vehicle stores at Seymour is 11 feet, and if the roof is kept a little higher than is absolutely necessary, it prevents the buildings having a squat appearance. The saving in material if lower sheds are built is not much, as we would be working to certain lengths of iron. Some of my officers are of the opinion that there is very little saving effected by reducing the height by 1 foot. My contention was that there must be some saving, and although we had not any 11-ft. iron we could use 6-ft. lengths. In some of our buildings a space has been provided between the iron and the ground at the back to relieve the wind pressure when the front is open; but at Seymour it is proposed to close up that space. I have been assured by the Defence Department that some of the vehicles are 9 feet 6 inches high, but I have not measured them. I do not know whether all of the vehicles are of that height. I have not been in the mobilization stores at Liverpool, and if vehicles 3 feet high are stored in a building with 11-ft. walls, perhaps it is proposed to store them one on top of the other, as was done on board ship. If stacked in that way, the wheels would, of course, have to be removed. The vehicle sheds proposed for Midland Junction are to have doors 9 feet wide, similar to those proposed for Seymour.

(Taken at Melbourne.)

TUESDAY, 20th JULY, 1920.

Present:

Mr. GAZDOVY, Chairman;

Senator Henderson,	Mr. Mackay,
Senator Newland,	Mr. Mathews,
Mr. Atkinson,	Mr. Moloney.
Mr. Bamford,	

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

30. *To the Chairman.*—I know the circumstances connected with the proposed establishment of mobilization and ordnance stores near Midland Junction, Western Australia, but I have not seen any plans or lay-out relating to the project. I have examined the site, which is distant from the Blackboy Hill Training Camp about 2 miles. So far as the future is concerned, the Defence Department has definitely determined that, within a reasonable period, the Blackboy Hill Camp shall be the permanent training camp in Western Australia. Unfortunately, the population of that State is at present very small. The total trainees which we have obtained from it, as the result of eight years' operations, number only about 9,500. It may, therefore, be fairly set down that we do not get more than 800 or 900 boys a year. We require for the efficient watching of this outpost, at least, a mixed brigade, which means some 6,500 men, plus a Light Horse Regiment of 300 men, or a total of 6,800 men. It will tax us very severely to get this number in Western Australia by voluntary enlistment, and under our universal training scheme. But, when that has been accomplished, what will it mean? It will mean that it will be nothing more nor less than a small outpost force, which is designed to watch the coast and to prevent any actual landing by a hostile force. There is no doubt that behind the Darling Range such a place as Northam would be an excellent one for the mobilization and concentration of a main force. But, if the same principle were applied to the concentration of a little "watching force," it would be so far distant that it would be unable to perform its proper function, which would be to prevent a landing in the vicinity of Perth. It may be said that my statement is probably true so long as the force there consists of only 6,000 men, and I may be asked whether that condition will continue for any length of time. My answer is that it will continue until such time as the watching force reaches at least a division in strength. When we have a sufficient force in Western Australia to support a "watching force" of reasonable size, we shall have to consider a place of concentration for it, so that it may be in a position to back up the small advanced guard of which I have spoken. Notwithstanding all the difficulties that are attendant upon having troops located near a city, it would not be safe, for tactical reasons, to take the "watching force" further away from Fremantle, because, in case of a threatened attack, it would not be able to move with sufficient quickness. Just as in Victoria we have to mobilize small bodies of troops at Dandenong and Geelong as advanced guards, small bodies will have to be mobilized at Midland Junction in Western Australia. Main forces would have to be concentrated at places further back. Of course, the railway system of Western Australia does not lend itself to defence purposes so well as does the railway system of Victoria. In the former State, the only convenient

place for mobilizing a small body of men for advanced guard duty is at Midland Junction. I have considered the question of going over the Darling Range for a training camp site, but I am not sure that the advantages to be gained by so acting are as great as are imagined. There are so many facilities at Midland Junction, including the possession of an area of land, that it is scarcely worth while sacrificing them for the advantages we should obtain on the other side of the range. Of course, at some period in the future, we may have to go there. It is a great disadvantage that the training camp at Blackboy Hill should be situated so close to a large town, but it is an inevitable disadvantage on account of the exposed position of Fremantle.

31. *To Mr. Bamford.*—If we had a division on the western side of the range, our stores would be sufficient to supply it with the necessary equipment; and we should continue building there until we obtain the division of which I have previously spoken. But, thereafter, we shall have to consider the necessity for acquiring another site further east.

32. *To the Chairman.*—In connexion with an ordnance store, it is very essential that rapid transit should be provided for goods coming into, as well as going out of, it. In dealing with the vast accumulations of stores that we receive, an ordinary business man would naturally go in for the erection of a "grand magazine," which would be in the nature of a reserve store, and for expense stores in which to store the material which is being used. At some place or other he would have to keep his reserves. Mobilization stores are in the nature of expense stores, and auxiliary to them will be smaller expense stores. At the big reserve store it may be necessary to have a certain quantity of stuff, which is to be expended from time to time, and to replace issues from the mobilization store. An ordnance store is really a reserve store. It is not necessary that these reserve stores should be located at the place of mobilization, because they have different and varying functions to perform. In time of peace, for example, they have to supply the expendable stores. It is not easy to say how much of our stores will be placed on issue to the Militia Units in time of peace. Our aim is to reduce the amount to a minimum, because it is unfair to ask the officers of the Citizen Forces to take care of large quantities of Government stores. But a certain quantity of stores will always have to be issued. Consequently, in locating these reserve stores, one has to be influenced by the expendable portion of them in time of peace. I have told the Quartermaster-General that normally these reserve stores need not be situated at the places of mobilization, because the latter are some distance from the police stations of units. Generally speaking, some convenient place near the city is more suitable. The Quartermaster-General and myself discussed whether it was advisable to keep the proposed stores in the city or to take them out to Midland Junction. We made certain inquiries locally, and we found that there was a general trend of manufacture towards Midland Junction. This is being shown in a very pronounced degree, and that circumstance influenced us in arriving at the decision we did; secondly, traders will enjoy considerable facilities for delivering goods at Midland Junction by rail. For example, if a man were making vast stocks of saddlery anywhere in the Commonwealth, he would probably be able to deliver them at Midland Junction very easily. Then, if deliveries have to be made into this store from the east, the Midland Junction site will be a very convenient one. I do not think that it is very much more than 9 miles from Perth, and that fact did not seem to us to be a very great disadvantage. Lastly, the piece of ground which

is nearer to the city, and which was available to us, proved to be very unsuitable. Accordingly, I acquiesced in the view of the Quartermaster-General—that in the present instance it might be desirable to place the stores at Midland Junction. I believe that that officer did consider the question of the cost of delivery and of the quantities of materials which will be received there annually. The fact of having the mobilization and ordnance stores under one control may tend to economy, but only to a very minor degree. In this instance I see no objection to the two stores being located together, although I am not keen upon that course being followed as a general principle. I have already said that, in course of time, our mobilization stores may have to go further east. I think that the Quartermaster-General has unnecessarily restricted himself from the stand-point of the limited area that is included in the site. I have urged upon him that the Commonwealth should also secure the piece of land on the other side of the railway. It is a very useful block, and we certainly ought to acquire it.

33. *To Mr. Mackay.*—I cannot say whether the State Government own that piece of land.

34. *To Mr. Bamford.*—I do not think that it is at present being utilized by the State. My recollection is that some use was made of it in connexion with wheat storage. It is a very good piece of land; and, seeing that we must stick to the site until our advance guard force reaches a division, I think that we shall be well advised in securing it. There is no doubt that the area embraced in the present site rather tends to cramp the buildings to be erected upon it.

35. *To the Chairman.*—In the field we have mobile ordnance workshops which undertake minor repairs for us. In connexion with all our ordnance stores, we are, therefore, establishing the nucleus of these mobile ordnance workshops. These will need a considerable quantity of tools and a certain amount of machinery, and altogether will be of some importance. While the site is very much cramped, there are facilities for exit from it which, to some extent, compensate for this. I anticipate that the store housed in the buildings on this site will be fairly valuable, and I must confess that there is an element of danger in having the workshops so close to them. Wherever a forge is placed there is a degree of risk. At the same time, there is nothing more than a reasonable risk involved. I cannot remember whether the piece of ground at the southern end of the site, where there is supposed to be a gravel bed, is easy ground, or whether it dips away to the river. If the area on the other side of the railway were resumed, it might involve the building of another siding, but that work would probably be worth while. If the land were used for vehicle sheds alone, we might possibly be able to dispense with the siding. I favour the building of a ramp at each of these places for the unloading of vehicles. If the piece of ground on the other side of the line were secured by the Commonwealth, the vehicle sheds could be erected upon it, and in all probability the workshop could be erected there also. In that case, the necessity for a siding would not be nearly so pressing. Arrangements might also be made with the railway authorities to place a platform on that side for loading purposes which would meet all our requirements. We should then have ample ground, I think, to meet our needs for many years to come.

36. *To Senator Henderson.*—When I examined this site we were on the look-out generally for a suitable locality. Having determined that the locality was a suitable one, the Quartermaster-General had it re-

commended by the authorities in Western Australia, who must have satisfied themselves that the drainage of it was satisfactory.

37. *To Mr. Atkinson.*—As far as one can humanely see, the site for the proposed stores will continue to be a suitable one until such time as we have reached the strength of a division in Western Australia. That will be four times the size of the present force; and I think, therefore, that we can safely say that the site will be used for the next quarter of a century.

38. *To the Chairman.*—If the proposed works be carried out, the position will be quite all right in time of war.

The witness withdrew.

Lieutenant-Colonel Archie John Landles Wilson, Director of Equipment and Ordnance Stores, Department of Defence, sworn and examined.

39. *To the Chairman.*—I am aware of the reference submitted to the Committee in regard to ordnance and equipment stores in Western Australia, and have seen the plans and drawings of the works. I have not inspected the proposed site at Midland Junction. The ordnance, equipment, and mobilization stores are to be erected on the same piece of ground, and are to be under the one control. That will lead to economy in administration, and will not involve the appointment of separate staffs—one to deal with the mobilization store and the other with the ordnance store. I have been giving attention to the question of ordnance stores in all the capital cities of Australia. In determining the location of an ordnance store, one of the chief considerations which would appeal to me is that the store should be regarded as an ordinary business warehouse. The first essential is that it should be as close as possible to the manufacturing centre of the State. That is an all-important consideration. An ordnance store should not be away from the centre of manufacturing unless some strategic point is involved. In this instance, objection was taken to the ordnance store being south of the river, and we, therefore, were unable to provide for its erection in the manufacturing centre. I understand, however, that there is a great likelihood of the manufacturing centre of Perth gradually extending to Midland Junction—the proposed site of these stores. Good rail and road communications are also essential. Sea communication is advisable where possible, but is not absolutely necessary. In this case, we shall be within reasonable distance of the sea, since the stores will be only some 20 miles from the chief port of the State. I am unable to say whether there are good road facilities between the site and the manufacturing centres from which we shall be obtaining our supplies. The railway facilities, however, are good. Goods will be received at Midland Junction in big lots, but will be sent out from the stores in comparatively small parcels. In the great majority of cases, the goods will have to be sent to Midland Junction by road and then railed to their destination. Although a good road is highly desirable, nearly all deliveries in normal conditions will, I think, be by rail. We shall probably have 1-ton motor lorries picking up the smaller parcels from the railway station and delivering to the stores. I have endeavoured to take out an estimate of the additional cost that will be involved by having the ordnance store at Midland Junction instead of in the city, but it is rather difficult to arrive at. In the first case, the new ordnance store will be alongside the main marshalling yard, and that will result in a saving as compared with the existing arrangement. At present, goods have to be railed to Midland Junction and then distributed, which means double handling. Against that saving,

however, goods from overseas to Western Australia will have to be carried an additional 12 miles by rail from the seaport to Midland Junction. In normal times, the extra expenditure on freight involved by having the stores at Midland Junction instead of in the city should be in the vicinity of £150 per year. That, however, would probably be balanced by the greater protection afforded stock in stores at Midland Junction. There will probably not be the same accumulation of dust there, and consequently there will be less cleaning than would be necessary if the ordnance stores remained as at present, in the heart of the city. You ask whether the greater proportion of the supplies going out will be sent to the camp at Blackboy. The answer to that depends upon the policy of the Government. If it is decided to re-equip the Militia, then very little will go from the ordnance stores to Blackboy Camp, with the exception of camp equipment, and that under the new arrangement all equipment will be issued in camp. There will still be, however, a considerable distribution to rifle clubs all over the States, and to the different units. I estimate that, at present, in Western Australia, we hold stocks of clothing and equipment to the value of about £250,000. Those figures are exclusive of ammunition and vehicles. An additional £100,000 would have to be allowed for ammunition, and about £15,000 for vehicles. I am not including mobilization stores. We do not insure our stock. I am satisfied that the buildings shown on the plans will be sufficient to meet the requirements of the State for some time. They will allow for spare room, as compared with the space now occupied. The suggested building is ample for present requirements. In reply to an earlier question, I should have added that, when the mobilization stores are created, certain goods now classed as ordnance stores will become mobilization stores, and will be transferred from the ordnance to the mobilization stores, thus reducing the present demand upon the ordnance store. The proposal to construct the ordnance store of galvanized iron will satisfy me; but it will be necessary to provide greater protection than a galvanized-iron building affords for such articles as waterproof sheets and rubber goods. The plans, so far as I know, make no such special provision. I should certainly prefer a portion of the building to be of brick, so as to afford greater protection for rubber goods. Such goods, at present, are housed in brick buildings in Perth. At all events, it would be advisable to put up brick partitions on the south side for the purpose I have named. An area of about 20 feet square should be bricked off in that way. It is necessary to keep all rubber goods cool and in the dark. That could, of course, be secured by going a little below the ground-level; but I do not think it is necessary to provide cellar accommodation. I would prefer merely to have a portion of the store bricked off, so that if it would be of ready access. If the provision of cellar accommodation would be cheaper, I should offer no serious objection to it, but the matter is perhaps one on which the Works Director should be asked for an opinion. Some portion of the store should be so constructed as to provide cooler quarters for perishable goods. I have seen the equipment stores at Liverpool. Those to be erected at Midland Junction will be of something like the same type. I certainly think that the space below the floor line, which, in this case, will be 3 ft. 6 in., should be enclosed, either by galvanized iron or timber, so as to prevent rubbish blowing under it or persons getting under the building. I think it would be better to enclose it in that way rather than to use pig-netting for the purpose.

The plan shows that the roof of these buildings, but not the walls, will be lined. The walls of the ordnance store, especially those to the north and the west, should be lined. We do not keep food supplies in our ordnance stores, but we have a large quantity of wool, and cotton goods. Some of these goods will be placed on shelves in this store, but most of them will be piled. It would not be necessary to line the walls of the mobilization store. Even if the walls of the ordnance store were lined, I should like to have a brick partition erected to provide cool storage for rubber goods. We found it necessary to ask that special provision should be made for the accommodation of rubber goods in Adelaide. Mobilization stores and vehicle stores of the type to be erected at Seymour will be suitable for us at Midland Junction. It is necessary that the building should be, at least, 10 feet high, so that ambulance waggons may be taken into it. The height of an ambulance waggon is 9 ft. 6 in. I submit a letter from the Commandant of the 5th Military District, setting out the present position in respect of the relinquishing of the Exhibition Building, Perth, and removal of stores from that place. The letter is as follows:—

Commonwealth Military Forces,
5th Military District,
District Head-Quarters,
Perth, 6th July, 1920.

The Secretary, Department of Defence.
Reference—36908 of 6th May, 1920.
Subject.—Accommodation for Ordnance Stores.
With reference to provision of store accommodation for ordnance stores, the following progress is reported:—

1. The camp equipment section, from Hay-street, Perth, has been transferred to Karrakatta.
2. Clothing from Hay-street, has been transferred to the Artillery Drill Hall, Fremantle.
3. Waggons, &c., from overseas have been housed at Blackboy.

The remainder of the stores at Hay-street will, as far as can be ascertained, be accommodated at Blackboy, and it is anticipated that no expense for renting premises will be incurred.

The Y.M.C.A. have placed their hut at Blackboy at the disposal of the Department at a rental of £150 per annum. A further progress report will be furnished on a further survey being made of the camp buildings at Blackboy during the next week.

(Sgd.) WALLACE BROWN,
Colonel,
Commandant, 5th Military District.

The plans provide for 14 chains of siding accommodation. That will be sufficient for the existing organization. A small ramp, sufficient to enable one vehicle at a time to be taken down from the siding, would be very useful, but I should not like any of the roads to be blocked by the making of such an addition. In the absence of a ramp, we should have to improvise in order to take off our heavy gun carriages and ammunition waggons. At Liverpool, we run the vehicles right through one of the equipment stores. It would have been better to have a ramp there, and one could only so difficultly. It is anticipated that we shall need a floor space of about 9,000 square feet for the workshops; but I see, as you point out, that the plan provides for only 6,000 square feet. I do not think the part shown on the plan as the site on which the workshop is to be erected is suitable for a workshop of the dimensions shown. Having regard to the fact that we do not insure, I think the workshop should not be so close to the ordnance store as is shown on the plan. The Chief Inspector of Ordnance Machinery, who is the official directly controlling workshops, informs me that he does not consider that it is absolutely essential to have a railway actually running into the workshop. That being so, I should say that a site

on the other side of the railway line, at Midland Junction, would, as you suggest, be quite suitable for the workshop, which will deal with repairs to vehicles, gun carriages, small arms, and tent mending. I should prefer not to cross the line to get a site for the workshop, but I see no very great disadvantage having the workshop on the other side. A level crossing could be put in, so that vehicles might be readily run across to the workshop. In that way more room would be secured on the present site. I certainly am not satisfied with the actual position allotted to the workshop on the plan before the Committee. In my opinion, if the workshop is to be erected on the site, it should go down to the south end. That would not be too far away from the ordnance store. The workshop is practically a separate organization. I consider the piece of ground edged blue on the plan is sufficient in area; but, having regard to the shape of the area, would recommend the acquisition of an additional block on the opposite side of the line. The Committee will be able to obtain in Perth information as to the actual in-goings and out-goings of the ordnance store. We do not store any vehicles, other than the ambulance waggons, that are 9 ft. 5 in. high.

40. To Mr. Mackay.—I was consulted as to the construction of the proposed ordnance store, and I think the building will be satisfactory, subject to the erection of brick partitions to protect the rubber goods. It is true that leather goods remain in stock for a considerable time, but, if they are stored at the southern end of the building, and are properly looked after, they will not be likely to deteriorate because of the heat. The woolen and cotton goods stocked by us are usually baled, and the bales are lined with brown paper. If the requisite funds were available, I would recommend a brick rather than a galvanized-iron building. The building of these stores is not as urgent to-day as it was a few weeks ago, but new buildings are still urgently necessary, so that the stores may be properly controlled. Temporary arrangements have been made in respect of the stores held at Perth at the present time. Under normal conditions, our stock held in ordnance stores would be equal to two years' requirements.

41. To the Chairman.—The average daily receipts are approximately 1 ton weight, or 6½ tons measurement. Issues are approximately of the same weight, but of probably one-third greater measurement owing to the splitting of bulk deliveries into small issues.

42. To Mr. Mackay.—Waterproof sheets, of which we hold a big stock, are practically the only goods likely to deteriorate owing to exposure. There are also certain rubber fittings for different parts of equipment, but they do not occupy much space. If the buildings are lined, there will not be much likelihood of the deterioration of leather goods as long as they are stored away from the sunny side.

43. To Mr. Maloney.—The walls of the vehicle store are to be 11 feet high. The plans do not provide that the walls of the ordnance store shall be lined, but I recommend that they should be.

44. To Mr. Atkinson.—I have occupied my present position for six years, and have been dealing with ordnance stores for eleven years. While I was abroad I went through many ordnance stores in America, England, and France with the object of acquiring a knowledge of the most up-to-date methods.

45. To Mr. Bamford.—I do not think the provision to be made for perishable goods was discussed when the proposal to erect these stores was first made. I know that the plans were being prepared, and perhaps

should have inquired if such provision was being made. I did not proffer to the responsible Works officers any suggestion in regard to the matter.

46. To Mr. Matthews.—The Ordnance Stores, Melbourne, are of galvanized-iron, and are unlined. I have seen very considerable numbers of perished waterproof sheets in those stores. The Darling Island store has always been very damp, and that would account for the mildew which you saw on leather goods stored there. I have not known other than rubber goods to deteriorate at the Melbourne Ordnance Stores, or to show undue deterioration where proper care has been exercised. To the best of my knowledge, for a short period of the year the heat is greater in Perth than in Melbourne, so that it is more necessary that the ordnance stores at Midland Junction should be lined than it is that the Melbourne stores should be lined. It is not important that the mobilization store should be close to the ordnance store. I think, however, that the ammunition store would be better placed at the southern end of the site. That would leave room for future expansion. The ammunition store must, of course, be on the railway siding. The question as to the number of men to be employed at the workshop can best be answered by the Chief Inspector of Ordnance Machinery, but I will give you such information as is in my possession. The principal work to be done there will relate to the repair of guns, vehicles, small arms, and tents. It is estimated that we shall employ about seventeen men on the three sections. A considerable area is required for tent mending. In the case of the large tents more particularly, a large space is required in order that they may be spread out and the actual repairing needed so discovered. The armoury also needs a good deal of accommodation. We have to store the rifles coming in. We always have a fairly large number of rifles waiting inspection and repair, and a fair number coming in and going out. The congestion in Melbourne in this regard is very bad. I have taken out the rough details for each section. I estimate that we shall require 1,500 square feet for the armoury section, and the same area for the tent-mending section, while a balance of 6,000 feet is asked for by the Chief Inspector of Ordnance Machinery. That will be required for handling the big guns and the machinery section. We have no sprinklers over the Melbourne Ordnance Stores. The only store in which they are used by us is that at Circular Quay, where they have been in position for many years. I believe that on one occasion there was a slight mishap owing to one of the sprinklers starting, but to the best of my knowledge practically no damage was done. The Fire Brigade authorities, I understand, inspect the sprinklers to insure their effectiveness in case of fire, but I will obtain further information for you in regard to that matter. I have always held that, in time of war, as the mobilization stores would be almost immediately emptied, they would practically become ordnance stores. That is to say, the ordnance store accommodation provided for peace requirements would be totally inadequate in time of war; but, as the mobilization stores would rapidly empty, we would automatically use those stores for ordnance store purposes. Buildings used as mobilization stores in peace time would become ordnance stores in time of war. I have no doubt that the fact has been taken into consideration that about 3 miles from Midland Junction we have over 700 acres of ground, which would be very valuable for training purposes and camping requirements in time of war, especially as the area at Blackboy is relatively small.

47. To the Chairman.—It will be unnecessary to provide a light overhead crane for the ordnance store.

When I was in England, I found that the overhead travelling cranes, with which many of the new ordnance stores were fitted, were being dismantled, and that the overhead run-ways were being used for other purposes. It was discovered that the run-ways were too slow in dealing with equipment of less weight than, say, a 12-in. shell; that it was possible to do very much better with hand-trucks. We do not store aeroplane material in the ordnance stores. I certainly think that these plans should provide for a changing-room and a luncheon-room, with provision for hot water, for the employees. I notice that the plan shows a five-barbed wire fence enclosing the site. I always prefer a lean-over on the top, as it tends to greater security. I shall be glad, as you suggest, to consider whether the siding accommodation, as shown on the plans, is ample for our requirements, and to advise the Committee later on.

48. *To Mr. Hanford.*—If there is no engineering difficulty in the way, I think that the siding should be continued further south.

48a. *To Mr. Mathews.*—In reference to my previous evidence, I desire to state that the sprinklers in the Circular Quay store, Sydney, are inspected once a week by the foreman, and at intervals by Messrs. Wormald Brothers, the local agents, particularly after any irregular ringing of the gong has been reported. The apparatus has never been known to function on account of fire or other reason, but the gong occasionally sounds without the sprinklers working, owing, it is believed, to heavy fluctuations in the water mains.

48b. *To the Chairman.*—After giving further consideration to the length of siding necessary at the stores, I am of opinion that a length of 14 chains, as proposed, is sufficient.

(Taken at Perth.)

TUESDAY, 27th JULY, 1920.

Present:

(Sectional Committee).

Mr. GREGORY, Chairman;

Mr. Atkinson,

Mr. Moloney.

Mr. Mathews,

John Smith Murdoch, Chief Architect, Department of Works and Railways, sworn and examined.

49. *To the Chairman.*—I have inspected the site at Midland Junction. The proposal of the Defence Department is to erect on this site, which has been compulsorily acquired, and which is on the Darling Range railway, as it branches away from the Midland Junction station, one ordnance store, 306 feet by 100 feet; one equipment store, 153 feet by 100 feet, which will be capable of extension to meet future requirements; one small arms ammunition store, 60 feet by 80 feet; one vehicle store, 300 feet by 100 feet; office buildings, 40 feet by 20 feet; and a caretaker's cottage, 35 feet by 45 feet. The programme does not include the erection of a workshop at present, but on the Estimates for 1920-1, which have yet to come before Parliament, very considerable provision has been made for workshops in all the military districts, including that of Western Australia. The military authorities, I understand, have not yet determined the precise location of the workshop, but on the plan submitted by the Defence Department to the Works Department there is shown a site for it. Although you say you have had evidence that it is thought desirable that this future workshop

should be 100 feet by 60 feet, should provide accommodation for armourers, carpenters, blacksmiths, and tent repairers, and should be located on this site, I do not think the Defence authorities have yet made up their minds as to its size or exact location on this site. The State Works Department of Western Australia, under instructions from Commonwealth Works Department, Melbourne, carry out all Commonwealth works in this State. The State Works officers here consulted with the local Defence authorities as to what the needs of this workshop would be, and I have a skeleton plan, which has not been before the military authorities, showing what the workshop is likely to develop into. Although it is not included in reference to the Committee I can, if desired, show what has been prepared as a result of this consultation between the local Works officers and the military authorities. This skeleton plan, which I now produce, provides for a workshop 100 feet by 60 feet. I do not think its erection at the point shown on the plan would have a detrimental effect on the store buildings. The site has already been acquired, and the railway siding when brought into it will be parallel with the existing Darling Range railway. The new store buildings of all kinds will be parallel with the railway, and the outside platforms will be up against it. A road will have to be constructed on the other side of the buildings to give road as well as railway access. A considerable building space will be left between the road and the public roadway, and will be suitable for any other buildings that may be required. The area acquired is about 230 feet wide. According to the plan, the siding will be 18 feet wide; the platform on each side of the stores will be 10 feet wide, and the new road, 25 feet wide, leaving approximately 65 feet between the road and the public roadway, known as Bayley-street. The proposed workshop, 100 feet by 60 feet, if located as shown on the plan, will have Bayley-street on the one side and the new road on the other. The new roadway will not be carried on to the vehicle-sheds, which will be at the south end of the site, and the floor of which will be on the natural level of the site. The whole of the space in front of the vehicle-sheds will be required for manoeuvring vehicles. We cannot put other buildings there. The ordnance store is to be constructed of wood and galvanized iron. It is estimated that goods of the value of £250,000 will be stored there. If the workshop is erected on the site shown in the plan, extreme care and watchfulness will be necessary. I think it would be desirable to have the workshop on a different site altogether. The point as to whether its erection there would not be a menace to the rest of the buildings is well worthy of consideration since it is sure to contain several small forges. The lutes and general machinery would be supplied, I take it, with electric power from Midland Junction, but there would be a blacksmith's forge, and although I do not think the menace is a serious one, I should not advocate the erection of a workshop so close to a building in which uninsured goods of the value of £250,000 were stored. When it became necessary to get out stores with a rush, to meet an urgent demand, I do not think the 25 feet roadway would alone give ample space, and, therefore, apart from the possible menace of fire presented by the workshop, I should prefer to have the whole space between the stores and Bayley-street free. The ordnance store will be of the type to be erected at Seymour, subject to modifications imposed by local conditions. For instance, in this case the timbers used will consist only of jarrah and karri. When the timber comes in contact with the ground karri will have to be avoided. It is really immaterial whether the timber obtainable is dry or not, since it will quickly season in these buildings. The ordnance store will be 306 feet long by 100 feet wide, divided into two stores by

a 9-in. brick wall across the centre. This wall will have at intervals three strengthening brick piers, 18 inches thick. There will be fire-proof doors between the two stores. As at Seymour, there will be a platform at each side, one giving access to the railway, and the other to the roadway.

50. *To Mr. Mathews.*—The platform will not be carried round the ends of the buildings. The floor levels will be entirely dominated by the decision arrived at as to the railway siding levels.

50a. *To the Chairman.*—The State Engineer for Existing Railway Lines considers, I understand, that he should construct the siding. The railway levels determined on will have a grade of about 1 foot in 264 feet—that is to say, 3 inches to 1 chain—the maximum grade allowed by the Railway Department. The railway level will have to be 2 feet 10 inches or 3 feet below the platform. The railway siding level will also determine the road level on the other side of the building. Incidentally it will likewise determine what earth works we shall have to carry in order to level the site from the railway across to the road level. From the new road level there must be a fairly easy slope down to Bayley-street. The height of the stumps will be slightly more or less than is shown on the plan, according to railway levels determined upon. I do not anticipate, however, that the railway scheme will affect to any serious extent the building scheme as now submitted to the Committee. My inquiries over here have not affected my estimate to cost. As a matter of fact, owing to the Public Service strike the State has been closed, and I only obtained the whole of the estimates yesterday. The State Architect, Mr. Hardwick, has obtained from the strike committee an exemption so that he may attend before the Committee and give evidence. The estimates in respect of these buildings do not differ very materially from those in respect of similar buildings to be erected at Seymour. I was interested in learning how the estimates prepared here for the same class of building would compare with our own, and, speaking generally, they are in agreement. For the storage of rubber goods a brick room 25 feet by 32 feet, which would include two bays, or 25 feet by 48 feet, which would include three bays, could quite conveniently be built along the brick dividing wall in the ordnance store. It would be wise to enclose the space below the floor level with 3 in. by 1 in. jarrah battening, and so prevent rubbish from being thrown under the building. That has not been provided for, but would not involve much additional expense. The next building, the small arms ammunition store, is to be of brick, and will be rather elaborate. What we are proposing to erect here is a building 60 feet by 60 feet, which may be extended if found necessary to 120 feet by 80 feet. It will be a plain brick structure with 14-ft. walls and a double roof. An important essential of such a building is that it shall be as cool as possible. The outer roof will be of galvanized iron and the inner roof of maltloid.

51. *To Mr. Mathews.*—The ceiling will be close lined and covered with maltloid.

52. *To the Chairman.*—There will be a 2-ft. space between the two roofs to secure a free passage of air. This double roof and the fact that the building is to be of brick will increase the cost very much as compared with the equipment store. The inside walls are not to be plastered. Bricks are to be used, because it is considered they will provide a building slightly cooler than one of iron. Cordite deteriorates very rapidly when the temperature goes beyond a certain height. A rather special and elaborate system of ventilation is to be provided. On no account must there be any possibility of hot air coming down the ventilators, and

therefore, the ventilators entering the building through the walls and ceiling will be provided with sliding doors, which can be opened or closed as desired by the man in charge. A certain temperature must be maintained, and the ventilators will need to be constantly under observation. This building will be raised to the platform level. It will be filled with sand and to the floor level, and the floor will be of brick. There will be no ventilation under the floor. The platform in front of it will be 3 feet 3 inches wide, and the roof, which will have a 9-ft. 3-in. projection, will extend well over the platform, so that the doors of the railway waggon will come well under it. Thus in removing the boxes of ammunition from the railway vans to the building they will be under cover.

53. *To Mr. Mathews.*—I recognise that, as you point out, the funnel of an engine running along the siding would pass just under the projecting roof of the small arms ammunition store. It is therefore quite possible that on a windy day a spark from an engine might be blown between the roofs. That is certainly dangerous, and in view of this very important point just raised by you, I think it very necessary to reconsider the roof projection. This plan is worked out on the basis of a 4-ft. 8-in. gauge, whereas we shall have here to work on a 3-ft. 6-in. gauge. That will bring the engine funnel still further under the projecting roof. I will reconsider the whole question of the roof and ascertain whether it would be feasible to set back the small arms ammunition store from the line, which would mean that the boxes of ammunition would have to be carried to it from the vans.

54. *To the Chairman.*—The ammunition for field guns, as you say, will have to be conveyed by waggons to East Guildford, and, therefore, exposed, so that the projecting roof may not be necessary merely to protect the small arms ammunition from the weather while it is being removed from the vans to the store. It will, however, keep the walls cooler than would otherwise be possible.

55. *To Mr. Atkinson.*—It would be quite possible on a blowy day for smoke and sparks to be carried under the projecting roof, and for the sparks to lodge between the two roofs.

56. *To the Chairman.*—The equipment store will be of galvanized iron with a lined ceiling, and will be exactly similar to that at Seymour, save that local timbers will be used. The plan shows that space is being left for another equipment store, in addition to the half-store that we are now proposing to build, and that the siding is to branch into the main line on the southern end of the equipment store now to be proceeded with. I see no difficulty in the way of continuing the siding along the whole range of buildings now to be erected as well as those projected. From a building point of view, I do not think we could get a site presenting fewer difficulties. The vehicle store is on the lines of the Seymour building, but a question has been raised as to whether a gravel floor would not be as satisfactory as a floor of bricks laid on the flat such as we have provided for. The substitution of gravel for brick would mean a saving. A well-rolled gravel floor would if kept under observation be practically immune from white ants, but it is for the Committee to consider what sort of gravel is available here for the purpose.

57. *To Mr. Atkinson.*—The moving of a heavy vehicle over a gravel floor would tend to roughen it, and it would have to be watered and smoothed out again. I do not contend that even the best of gravel would make such a good floor as would cement or bricks.

58. *To Mr. Moloney.*—A well-rolled gravel floor would be cheaper and might be worthy of a trial. If found unsatisfactory, it could be covered with bricks.

59. *To the Chairman.*—The State Minister for Works considers that this work should be carried out by contract, but the conditions would not provide that only timber supplied by the State mills should be used. A plan in the possession of the Railway Department shows that this site has a width of 230 feet. Assuming that we could keep the line of stores 20 feet within the railway fence, which would be ample, we should have beyond the 25-ft. roadway which we are to make alongside the outside platform an area 95 feet wide, which would allow of a building 60 feet wide being erected there, with 5 feet to spare. A road 25 feet wide will be ample. Two vehicles could pass with ease on such a road. It is true, as you say, that with waggons backed against the platform it would not be possible in ordinary circumstances for other waggons to pass them comfortably, but most of these waggons have English ferricariages so that the horses in the shafts can be turned at right angles to the waggons, and so give more space. I do not think it would be reasonable to erect the workshops at this point, but it would be possible to do so provided that its presence there was not regarded as a menace to the store. Motor lorries backed into the platform would occupy less space. The width of the land would not preclude the erection of a workshop on the site shown on the plan if there were no other objections to its erection there.

60. *To Mr. Moloney.*—The workshop in that case would have to be on the Bayley-street alignment. It would then be 30 feet from the ordnance store.

61. *To the Chairman.*—Having reconsidered the matter, if the projected workshop is to contain furnaces, I prefer to have it away from the site. If it is not to be fitted with furnaces I should have no serious objection to its erection there. In dealing with the estimates for military workshops, the construction of which is to be provided for on the current financial year's estimates, I found that they were of two kinds—vehicle workshops, and what are called general workshops. In a vehicle workshop furnaces for heating tyres, &c., would probably be used, but in a workshop dealing with repairs to rifles and such like equipment, it would be unnecessary to have anything more than small forges. The Works Department here prepared a skeleton plan showing what the accommodation was likely to be, and Mr. Hardwick, the Principal Architect of this State, will supply details of the basis of his estimate. He sent them to the head office, Melbourne, and in some particulars we varied them. The total estimate supplied by the Works Department here in respect of the whole undertaking was £24,397. We made certain alterations with respect to the engineering sections of the work, and the total submitted to the Committee by the Government varies slightly from that arrived at by the Department here. The estimate of £34,267 is made up as follows:—Excavations and leveling of site, £1,335; railway siding, £1,850; ordnance store, £10,400; equipment store, £5,432; small arms ammunition store, £3,958; vehicle store, £7,487; office, £458; caretaker's cottage, £300; lighting, water supply, fire service, drainage, and contingencies, £2,637. These figures do not include the installation of sprinklers, the estimate for which is an additional £2,380. That total of £2,380 is made up as follows:—Elevated tank, £700; sprinkler, ordnance store, £1,000; sprinkler, in respect of the smaller ordnance store, £500; sprinkler, in small arms ammunition store, £80. It is for the Committee to say whether these installations should be made.

62. *To Mr. Mathews.*—No provision has been made for a luncheon-room and lavatory for the men. I think it might be desirable to provide a luncheon-room. The roof of the ordnance store is to be lined. I do not think it is necessary to line the walls. To line the walls with karri would probably cost from £3 15s. to £4 a square. The building will be well ventilated, and an iron building after sun-dry set cools very quickly. Perishable stores should be packed away from the walls. If they were systematically stored towards the centre of the building they would not deteriorate. The suggested special provision for rubber goods is certainly valuable. The spoil from the railway siding and that coming out of the foundations will go a long way towards providing any filling that is required. The Committee on inspecting the site will recognise that it will be necessary to spread some filling at the north end in order to raise it slightly. We can obtain from the Railway Department cinders, which are excellent filling, at a cost which would not exceed more than 1s. per yard on the ground. The Committee may take it that something like 1,000 yards of filling will be required, so that if it were obtained at 1s. per yard the cost would be £50. That estimate, however, does not include the cost of bringing up the ammunition store floor level. You ask whether the Department would be inconvenienced by the erection of the ammunition store at the very south end of the site. It would not do very well there, because it is proposed to stop the earthworks before the vehicle sheds are reached. The ammunition store should be set back a little. There is no obstacle in the way of transposing the location of the equipment store and the ammunition store.

63. *To Mr. Moloney.*—If the projected workshop is to be erected on this site, the plot indicated on the plan is probably the best that could be selected. If it is shown that it would be a menace to the stores we should have to go to some outside site. That would mean the purchase of an additional area. The area already acquired is only 12 acres in extent. The workshop could be erected at the extreme southern end of the site, but the question as to how far it should be from the stores is one for the military authorities to determine. The present intention is that it shall be kept as close as possible to the stores for the obvious reason that the equipment to be dealt with in it would come from them. The estimated cost for the erection of a vehicle store at Seymour was £6,500, and the estimate in this case is £7,487. The Committee will remember, however, that we purchased our iron for the Seymour store for £52 or £53 per ton, whereas the price of galvanized iron at the present time is about £71 per ton. Notwithstanding that this is a jarrah country, the cost of jarrah here is, I think, more than hardwood in Victoria. These facts, together with the point that the blacksmithing works would cost a little more here than in Victoria, and also the brick flooring, will account for the difference between the two estimates. In connexion with the Seymour works we indulged in a little speculation. We received a hint that galvanized iron was likely to rise in price, and we cleared the market of what was offering at an average of about £52 per ton. I agree that it would be wise to have an inner store for rubber goods. It is not impossible to secure more land in the vicinity of this site. If a larger area is required there is a first-class block between the north end of the present site and the main eastern line. The block consists of 5 or 6 acres of good land, and on one corner of it there is a brick cottage which would be most suitable for a caretaker. This block would be well worth acquiring. We could buy the cottage for about one-

half of the cost of erecting a caretaker's cottage at the present time.

64. *To Mr. Atkinson.*—If the workshop is placed where shown on the plan it will allow a good deal of room for removal of material from the ordnance stores by waggons. It would also leave sufficient room to work the mobilization and equipment stores. There is room for a ramp. Only one ramp is necessary. If the small arms ammunition store were erected, as has been suggested to-day, on the site of the proposed small equipment store, then the new road to be formed along the range of stores would cease at the end of the small arms ammunition store, and a ramp could be carried down to the natural level of the site in front of the vehicle store.

The witness withdrew.

William Burden Hardwick, Principal Architect of Public Works Department, Western Australia, sworn and examined.

65. *To the Chairman.*—I have been over the site of these proposed buildings, and from a topographical point of view, I think it very suitable. We received type drawings from the Commonwealth offices, and have adapted them to local conditions. The site of this work was determined in Melbourne, and I am not responsible for it. In determining the lay-out of these buildings, I should have to depend upon the information of the military authorities. I think it is desirable to confer with the military authorities on the subject. We assumed that the Commonwealth Works officers in Melbourne had thrashed out the matter with Colonel Murdoch and the other responsible officers in Melbourne. Captain Andrews, of the Head-Quarters Staff here, has seen the plan, but neither he nor any other military authority has suggested any alterations that I am aware of. This site seems to me to be quite suitable from the point of view of the ready delivery of goods from local manufacturers to the stores, and for the expeditious delivery of goods from those stores to all parts of Western Australia. It taps almost every railway line. The road from the city is also good, so that the cost of delivery of goods by road from the manufacturers of Perth to the stores would not be heavy. The selection of this site was made by the Defence Department. I do not think we could secure near in any other site which would adapt itself so readily to the railway requirements. A slight advantage might be derived from the erection of a store at Maylands, but it would not result in any material gain. My knowledge of public works in this State, together with my general knowledge of the essentials of a site for stores of this kind, lead me to regard the area selected as suitable from the point of view of ready access from the State capital, and the means which it offers for the distribution of stores and equipment throughout the State. I am quite satisfied with the proposal that the ordnance store shall be of galvanized iron, although unseasoned material to the value of something like a quarter of a million is to be housed in it. It would not be difficult to provide an inner brick room running off the brick dividing wall. Such a room would mean a cooler atmosphere for the storage of rubber goods, and would tend to prevent their deterioration, and will be ordnance store will have wooden principals, and will be covered with galvanized iron, and karri for roof framing, with a raised platform to meet the railway requirements. The floor of the platform will be of planks, but not of karri. The building will be 25 feet high in the centre, and 21 feet at the sides. Jarrah or karri will be used in lining the iron roof, and the building will be quite well ventilated. The vehicle store, it is suggested, should be paved with bricks on the flat concrete bedded in sand. This is somewhat new to us. We have not hitherto used brick floors, but provided that the ground is solid such a floor should be quite suitable. Bricks here cost £2 14s. per 1,000 at the kiln. I would not recommend that the vehicle store floor should be of ironstone gravel. We have experimented with such floors in shelter sheds and other buildings, and have found them to be unsatisfactory. They have to be constantly watered and rolled. Then again, they are also dusty. We have used a great deal of jarrah plank flooring. A brick floor would be more durable. If a plank floor were put down we should povellize the jarrah. If that were done there would not be much danger of the vehicles stored there being attacked by white ants. We have known white ants to get through a concrete floor. If the vehicles were regularly inspected there would be no danger from white ants. It is not our experience that plank floors encourage white ants. A brick floor would be cheaper and better than a wooden floor. I will consider the suggestion that instead of framed ledge doors being used at the end of the vehicle store lattice doors or well-framed doors lined with pig netting should be used. These big doors must be expensive in any event, because steel mesh of all kinds is very dear. I am not a railway expert, but the siding proposed to be erected is of the usual class, and in keeping with those put in at the abattoirs and other places. I think it might well be a little longer, but it could not be extended very considerably since the railway grade becomes bad towards the southern end of the site. I do not think that the presence of the workshop on the site set apart for it on the plan would constitute a serious element of danger. I am not aware of the class of work to be carried out in it—whether small or large forges will be used in it—but if it is a reasonable distance from the stores there should be no serious risk. If, as you say, the workshop is to be occupied by armourers and, perhaps, one or two blacksmiths who would require small forges, then assuming that it would not interfere with the general working of the whole scheme there would be no objection to its erection beyond this site. It is only reasonable that forges and furnaces should be as far away as possible from the stores. I would recommend that the erection of these buildings be carried out by contract. It is difficult at present to rush work, and I think it would take from six to eight months to complete all these buildings. The first ordnance store might be erected in from two to three months.

66. *To Mr. Moloney.*—I certainly would not recommend a gravel floor in the vehicle store, or in any workshop other than that used by a blacksmith.

67. *To Mr. Mathews.*—We have known white ants to make their way through 6-inch concrete floor, and to eat deal lockers resting on them. They might make their way through the joints of the brick-work floors. We now invariably use povellized karri flooring in the north-west. We have no evidence that a quarter of a million is to be housed in it. It would not be difficult to provide an inner brick room running off the brick dividing wall. Such a room would mean a cooler atmosphere for the storage of rubber goods, and would tend to prevent their deterioration, and will be ordnance store will have wooden principals, and will be covered with galvanized iron, and karri for roof framing, with a raised platform to meet the railway requirements. The floor of the platform will be of planks, but not of karri. The building will be 25 feet high in the centre, and 21 feet at the sides. Jarrah or karri will be used in lining the iron roof, and the building will be quite well ventilated. The vehicle store, it is suggested, should be paved with bricks on the flat concrete bedded in sand. This is somewhat new to us. We have not hitherto used brick floors, but provided that the ground is solid such a floor should be quite suitable. Bricks here cost £2 14s. per 1,000 at the kiln. I would not recommend that the vehicle store floor should be of ironstone gravel. We have experimented with such floors in shelter sheds and other buildings, and have found them to be unsatisfactory. They have to be constantly watered and rolled. Then again, they are also dusty. We have used a great deal of jarrah plank flooring. A brick floor would be more durable. If a plank floor were put down we should povellize the jarrah. If that were done there would not be much danger of the vehicles stored there being attacked by white ants. We have known white ants to get through a concrete floor. If the vehicles were regularly inspected there would be no danger from white ants. It is not our experience that plank floors encourage white ants. A brick floor would be cheaper and better than a wooden floor. I will consider the suggestion that instead of framed ledge doors being used at the end of the vehicle store lattice doors or well-framed doors lined with pig netting should be used. These big doors must be expensive in any event, because steel mesh of all kinds is very dear. I am not a railway expert, but the siding proposed to be erected is of the usual class, and in keeping with those put in at the abattoirs and other places. I think it might well be a little longer, but it could not be extended very considerably since the railway grade becomes bad towards the southern end of the site. I do not think that the presence of the workshop on the site set apart for it on the plan would constitute a serious element of danger. I am not aware of the class of work to be carried out in it—whether small or large forges will be used in it—but if it is a reasonable distance from the stores there should be no serious risk. If, as you say, the workshop is to be occupied by armourers and, perhaps, one or two blacksmiths who would require small forges, then assuming that it would not interfere with the general working of the whole scheme there would be no objection to its erection beyond this site. It is only reasonable that forges and furnaces should be as far away as possible from the stores. I would recommend that the erection of these buildings be carried out by contract. It is difficult at present to rush work, and I think it would take from six to eight months to complete all these buildings. The first ordnance store might be erected in from two to three months.

68. *To Mr. Moloney.*—I certainly would not recommend a gravel floor in the vehicle store, or in any workshop other than that used by a blacksmith.

67. *To Mr. Mathews.*—We have known white ants to make their way through 6-inch concrete floor, and to eat deal lockers resting on them. They might make their way through the joints of the brick-work floors. We now invariably use povellized karri flooring in the north-west. We have no evidence that a quarter of a million is to be housed in it. It would not be difficult to provide an inner brick room running off the brick dividing wall. Such a room would mean a cooler atmosphere for the storage of rubber goods, and would tend to prevent their deterioration, and will be ordnance store will have wooden principals, and will be covered with galvanized iron, and karri for roof framing, with a raised platform to meet the railway requirements. The floor of the platform will be of planks, but not of karri. The building will be 25 feet high in the centre, and 21 feet at the sides. Jarrah or karri will be used in lining the iron roof, and the building will be quite well ventilated. The vehicle store, it is suggested, should be paved with bricks on the flat concrete bedded in sand. This is somewhat new to us. We have not hitherto used brick floors, but provided that the ground is solid such a floor should be quite suitable. Bricks here cost £2 14s. per 1,000 at the kiln. I would not recommend that the vehicle store floor should be of ironstone gravel. We have experimented with such floors in shelter sheds and other buildings, and have found them to be unsatisfactory. They have to be constantly watered and rolled. Then again, they are also dusty. We have used a great deal of jarrah plank flooring. A brick floor would be more durable. If a plank floor were put down we should povellize the jarrah. If that were done there would not be much danger of the vehicles stored there being attacked by white ants. We have known white ants to get through a concrete floor. If the vehicles were regularly inspected there would be no danger from white ants. It is not our experience that plank floors encourage white ants. A brick floor would be cheaper and better than a wooden floor. I will consider the suggestion that instead of framed ledge doors being used at the end of the vehicle store lattice doors or well-framed doors lined with pig netting should be used. These big doors must be expensive in any event, because steel mesh of all kinds is very dear. I am not a railway expert, but the siding proposed to be erected is of the usual class, and in keeping with those put in at the abattoirs and other places. I think it might well be a little longer, but it could not be extended very considerably since the railway grade becomes bad towards the southern end of the site. I do not think that the presence of the workshop on the site set apart for it on the plan would constitute a serious element of danger. I am not aware of the class of work to be carried out in it—whether small or large forges will be used in it—but if it is a reasonable distance from the stores there should be no serious risk. If, as you say, the workshop is to be occupied by armourers and, perhaps, one or two blacksmiths who would require small forges, then assuming that it would not interfere with the general working of the whole scheme there would be no objection to its erection beyond this site. It is only reasonable that forges and furnaces should be as far away as possible from the stores. I would recommend that the erection of these buildings be carried out by contract. It is difficult at present to rush work, and I think it would take from six to eight months to complete all these buildings. The first ordnance store might be erected in from two to three months.

attacked by white ants. Even assuming that the wagons in the vehicle stores would not be taken out very often, I should not recommend a gravel floor.

68. *To the Chairman.*—We have now to pay £2 14s. per cask for cement, and wherever possible we avoid its use. It is not manufactured here. Karri is very much cheaper than Oregon, but it is a little more expensive to work. You say that the estimate for the erection of vehicle stores at Seymour was only £8,500, although Oregon principles are to be used, whereas in this case the estimate is £7,287. As against that, we estimate having to pay something like £70 per ton for galvanized iron, whereas that for the Seymour store was purchased at £52 per ton. That will go a long way towards accounting for the higher price. Karri, which is to be used here, will be slightly cheaper than Oregon. It is estimated that the vehicle shed will require about 300 squares, or roughly, 20 tons of galvanized iron. That means only an additional £400 in respect of the cost of iron, but I do not think a comparison between this estimate and that for Seymour store can be fairly made. In making up this estimate we have been guided by recent contracts and prices. At the present time we must have regard, not to what we may think a work is worth, but to what we have to pay for it. In the event of the tenders received being too high, I would not recommend that our Department should carry out the work at the prices set out. The prices given in our estimate, however, are fair.

69. *To Mr. Mathews.*—We are at the mercy of not only the contractors but a shifting market. We pay about 20s. per 100 super. feet for karri, but have not used any for some time.

70. *To the Chairman.*—As to water service, we originally provided for a 3-inch supply pipe coming in from the main from the Mundaring reservoir, but after consultation with Mr. Murdoch we have decided to increase it to a 4-inch pipe. I do not think we would recommend the installation of a sprinkler system for these stores, notwithstanding the value of the goods to be carried by them. This is a class of building that we should probably insure. We insure isolated buildings. The provision against fire in this case is in accordance with our usual system, and standpipes are erected with a 4-in. service pipe and standpipes are to be erected. We consult the Chief of the Fire Brigades Board in these matters, and generally adopt his recommendations.

71. *To Mr. Mathews.*—The State Government has constructed various buildings by day labour. We built the Woolloomoo sanatorium and also the wireless station, and the Midland Junction Post-office by day labour, while, as chairman of the Workmen's Homes Board, I have built by day labour workmen's cottages representing an expenditure of over £100,000. I think that the Woolloomoo sanatorium is the only case where we exceeded the estimate. The increased cost, which was considerably above the estimate, was due partly to labour troubles and partly to the increased cost of material. I would not recommend that day-labour work be done by the Department. I should not mind undertaking day-labour work, however, if I were free to buy where I pleased, to make my own discounts, and to employ my own foremen in my own way. That would be quite different from following all the ramifications of departmental method. Given power to select my own staff and to follow my own system, I could build by day labour as cheaply as by contract, and could turn out an equally good job. The contract system in this case would be satisfactory, since under it I should get better results than by day labour under the ordinary departmental system.

72. *To the Chairman.*—Since the making of the estimate of the cost of these works there has been a 15 per cent. rise in timber. I allowed 7½ per cent. for contingencies, although we usually allow only 5 per cent.

(Taken at Perth.)

WEDNESDAY, 28th JULY, 1920.

PRESENT:

(Sectional Committee.)

Mr. GIBSON, Chairman;

Senator Newland, Mr. Mathews,
Mr. Atkinson, Mr. Moloney.

Colonel Wallace Brown, Commandant, 5th Military District, sworn and examined.

73. *To the Chairman.*—I have been in command here for about ten weeks. On taking over the various details of my command I inquired into the matter of the ordnance and mobilization stores, and found at the district headquarters, the ordnance store, the senior ordnance officer and part of his staff, while others were in a building in Hay-street east, as well as at Karrakatta and various other places. I asked whether action had been taken to secure premises, and was told of the proposal now before the Committee. The matter had been dealt with before I took command, so that I had nothing to do with the design of the buildings or the choosing of the site. I satisfied myself, however, as to the class and location of the site selected. I ascertained that Blackboy had been selected for the mobilization camp, and that the site was adjacent to a railway line and reasonably distant from the coast. I have not gone through the files, but I have inspected the site and have examined Midland Junction in relation to other parts of Western Australia affected by the handling of stores. Captain Andrewartha, engineer officer, was here while the departmental investigations were being made, and is prepared to give evidence. I have not been consulted as to the selection of the site or the location of the buildings to be erected. This is my first appointment as commandant of a military district. I have not had previous experience regarding the essentials of an ordnance store, but have been associated with ordnance in relation to troops. For many years I carried out the duties of general staff officer in various States, and, in that way was associated with the organization for the issue of stores to the troops when mobilizing for war and also for the annual issue to camps. In selecting a site for an ordnance store, and having regard to the receipt and delivery of goods there, I should, first of all, require that it should be near the centre of the railway system, so that, in the event of an alteration in the existing arrangements for mobilization, stores could be sent as readily in one direction as in another. The site should be a suitable distance from the sea-board. The extra railway journey involved in sending overseas goods from Fremantle to Midland Junction instead of to Perth, as at present, is immaterial, because on arrival at Perth they would have to be huddled and conveyed by wagons to the stores there, whereas we shall be able to take them off the railway trucks at the proposed siding and put them straight into the stores. The additional mileage is nothing, seeing that the railway in this case will run alongside our own stores. The usual issue of stores to regiments which goes on every month should not be taken

into consideration in determining the position of ordnance stores for mobilization purposes. The ordinary every-day issues can be made as readily as possible day-to-day from Midland Junction or any railway station outside Perth. Once a regiment receives its stores, only small parcels are sent out to it from time to time to make up losses or to keep up supplies. Such parcels can be consigned by rail. Midland Junction is the hub of the State railway system, and from the point of view of rail-road communication, the site is also suitable. Most of our materials come from overseas.

If any of our requirements are supplied by local manufacturers, it will be an easy matter to arrange for them to deliver at Midland Junction. If we made contracts with manufacturers in Perth and delivery had to be that respect, because the road to Midland Junction is good and the distance is not great. The expense attaching to road deliveries would not be excessive. In choosing a site I should give equal consideration to road and rail communication. Midland Junction is within easy reach of Perth. The contour of the ground lends itself to the erection of the required and, so far as I can judge, the drainage of the site is ample. The site is about 2 miles from Blackboy Camp. We will have a temporary store at Blackboy, where much of the ordinary camp material would have to be kept. Blankets and other goods requiring care will, however, have to be kept at the ordnance store and sent out to Blackboy as required. We are going to concentrate our stores at Midland Junction. At present they are scattered all over Perth. That means a larger staff, additional danger of loss by fire, and payment of rentals for leased buildings. The erection of these stores is urgent. The buildings we are renting must be vacated by a certain date, and at present we are engaged in removing stores from the Hay-street building to the camp. I do not know the nature of the next consignment of mobilization stores to be received. The equipment now arriving comprises wagons, &c., for the housing of which we have made temporary arrangements at Blackboy Camp. We have received a list of some of the things to come to us, but I cannot say that the list is complete. That being so, I am unable to express an opinion as to whether the proposed mobilization store will be ample. The matter, however, has been gone into by head-quarters, who know more than I do as to the development of the Forces. I think I have been here long enough to enable me to express the opinion that the Blackboy Camp should be permanent. I have not seen a more convenient site anywhere within a few miles radius of Perth. Its relative proximity to a big city like Perth does not lessen its value as a camp for mobilization purposes. It is convenient for any class of mobilization, and I should have no objection to putting any class of men into camp there. It is gravelled, well drained, has a pleasing aspect, and is a most excellent place in which to live. From the point of view of convenience of housing and training, I would prefer to use the Blackboy Camp for our annual training purposes rather than some more distant place in the hills. Our Citizen Forces are required to attend in camp for drill for only a certain number of days per annum, and we could not afford the loss of time that would be involved in carrying them to and from a more distant camp. Blackboy Camp may be reasonably regarded as a permanent camp for troops and conveniently situated. I should not like to say that it is the best that could be secured, because I have only travelled a few miles around Perth.

74. *To Mr. Mathews.*—I have not gone into the question of the proximity of Blackboy to the sea-coast for mobilization purposes. I consider it would be suitable for mobilization either for local defence or for overseas purposes. It is far enough inland for mobilization. It is not likely to be affected by sparks from the engines because of its proximity to the railway siding. One man can readily handle a box of 303 ammunition.

75. *To Mr. Moloney.*—The repairs to be carried out in the projected workshop would be similar to those done at an ordinary blacksmith's shop in town. I do not think the erection of the workshop on the site shown on the plan would constitute an additional danger from fire. The workshop, apart from vehicles, in which the forges would be used, could be located in a different spot so as to lessen the risk.

76. *To the Chairman.*—I fear the passing of an engine under the projecting roof would constitute a danger, having regard to my experience of the sparks given out from Collier coal. It is essential to the economical working of the stores that the workshop should be on the same site. I cannot offer an opinion as to whether or not the buildings provided for in the plan will be sufficient for all purposes for some years to come. That is not a point into which I have gone.

The witness withdrew.

Captain Ernest Andrewartha, Staff Officer for Engineers, 5th Military District, sworn and examined.

77. *To the Chairman.*—I have been associated with the proposal to erect these stores. When it was first made I was asked to advise as to what should be done. The general layout was not determined by me, but was carried out in combination with the authorities at Melbourne. We set out our storage requirements as borne office, with the information before it, took action had been arrived at as to the floor space required. We examined three or four sites. We had first of all strategic requirements of the military district. The information that we received was that there must be a natural obstacle between the site to be selected and the coast, that it should be a safe distance from the coast, in close communication with all strategic railways for the rapid handling of troops and stores. We were advised that the site must be on the other side of the river, and that instruction meant that we were confined to a site in or about the Midland district. We were also instructed that the site must be fairly level and capable of taking in all the stores to be ground at Karrakatta, but it was too near our own ground at Karrakatta, and I should have no objection to putting any class of men into camp there. It is gravelled, well drained, has a pleasing aspect, and is a most excellent place in which to live. From the point of view of convenience of housing and training, I would prefer to use the Blackboy Camp for our annual training purposes rather than some more distant place in the hills. Our Citizen Forces are required to attend in camp for drill for only a certain number of days per annum, and we could not afford the loss of time that would be involved in carrying them to and from a more distant camp. Blackboy Camp may be reasonably regarded as a permanent camp for troops and conveniently situated. I should not like to say that it is the best that could be secured, because I have only travelled a few miles around Perth.

circumstances, we went on to Midland Junction and selected a site where the wheat-sheds are at present. That was considered suitable, but the Railway Department would not allow us to have it. We then went to the present site, which was selected by Colonel Murdoch and myself as being suitable for the requirements of the Defence Department and as conforming to the instructions which had been laid down. This selection was immediately reported to Melbourne and was accepted. I have been over practically the whole of the Midlands area, and the site now selected is, to my mind, the only suitable one for our ordnance available at the present time in that locality. The site in the vicinity of Healeen Vale Race-course was mentioned by Melbourne, but is under water for the greater part of the winter months. In all these circumstances, we were confined to the one good site at Midland, which is close to Blackboy and conforms to strategical requirements.

78. *To Mr. Atkinson.*—We have 160 acres at Karrakatta, but that is only 2 miles from the sea-shore. A railway siding could be put in there, but, for strategical reasons, the Karrakatta site was not acceptable.

79. *To the Chairman.*—It is also too far removed from the railway centre. In order to insure the rapid handling of stores it was necessary that we should get closer to the hub of railway activities, and that is Midland Junction. The area acquired at Midland is 12 acres 0 roods 39 perches. It has a width of 350 links, which is equal to 231 feet, and the purchase price was £900. Blackboy has always been regarded as our permanent camp. A large sum has been expended upon it. It is fairly well removed from an active railway station. Believe, the nearest station, cannot be regarded as an "active" one. There is only one local hotel and that can always be put under control. Blackboy is also close to a centre from which troops can be conveyed to any part of the State, with the exception of Bunbury, which can be reached, however, through East Perth. We have always looked upon Blackboy as a training camp. To make it a big training camp we should require more ground for drill, but not for manœuvre purposes. The camp area is sufficient for ordinary mobilization purposes, but for manœuvre purposes we should have to place large tracts of suitable country under proclamation, as the cost of the land would preclude the acquiring of it. Assuming that the permanent camp was removed from Blackboy to some distance from Perth, the Midland Junction site for ordnance store purposes would not be suitable. If the camp were removed to another centre, which would be Northam, or close to it, it would be necessary to have our mobilization stores there, but the ordinary stores for regimental purposes could still be sent out from Midland Junction. The site has both good railway and road communication. It provides for convenience of handling in every shape and form, and strategically there is no objection to it. The report of the Senior Ordnance Officer here was that deliveries from Midland Junction would really cost no more than if the ordnance store remained in Perth. Once the stores are put ashore at Fremantle there will be practically no difference in freightage as between Midland Junction and Perth. A proposition which the Senior Ordnance Officer will put before you is that the present ordnance store in Francis-street should be used as an expense depot—that is to say, small stores issued locally, it is thought, should be stored in the present ordnance stores, and the small deliveries at Perth should be received at Francis-street. Apart from any question as to the Senior Ordnance Officer's personal convenience being suited by his remaining here, a small expense depot in Perth is necessary. It is a sound

proposition, but such an expense depot should not be allowed to assume the proportions of an ordnance store. Briefly put, the suggestion is that it should be a receiving depot for small parcels. I see no objection to the small-arms ammunition store being placed on any part of the site, except immediately contiguous to the forge. The proximity of the railway to the site shown on the plan as the location of the small-arms ammunition store is immaterial. Small-arms ammunition is safety ammunition. It should, however, be stored in a building 70 degrees Fahrenheit. The building should be of brick, with raised floors, a gable roof, and overhanging eaves. That is the normal construction. The plan provides for what we would describe as sound construction. Full siding accommodation for the rapid receipt and delivery of large quantities of goods is provided. The single line siding might have to be duplicated if the stores were largely extended. There is accommodation for a double railway siding, and with a siding running the full length of the stores rapid handling is insured. You ask what would be the position if in the one train we had a truck of goods for the ordnance store and one for the mobilization stores—how we should get the goods into the latter store? The answer is that we would simply kick on the truck to the ordnance store. The suggested objection applies to every railway scheme. The trucks must be marshalled in the order of the buildings. A single siding will be ample for present requirements, but room should be left for a double siding: A single siding on this gauge should not be more than 11 feet or 12 feet. The proposed workshop will be 60 feet wide. That will allow of the construction of a new roadway to provide for two-way traffic. I think it will be ample for rapid handling. We shall have something like £250,000 worth of goods in the ordnance store; and these goods will not be insured, but I would not have any hesitation in placing the workshop at the point shown on the plan. The sparks from an ordinary forge are very few, and, so to speak, very dead. With a blast on the forge very little goes up the chimney. Electric motors will be used in the machine-rooms. We shall have a machine-room for the armourers and artificers, a carpenter's shop, a painter's shop, a plumber's shop, and a tinsmith's room, in which we shall have electric motors, and I do not think we shall be taking any undue risk in erecting the workshop at the point shown on the plan. No inconvenience would be caused if it were shifted up a little further.

80. *To Mr. Mathews.*—We shall have a machine tool shop.

81. *To the Chairman.*—If the occupancy of the whole of this area by stores is contemplated, then the acquiring of a block on the other side of the road as an area for the expansion of the existing scheme should be considered. In dealing with this plan, I do not think we should look ahead for more than twenty years. We cannot definitely lay out any plan which might not have to be entirely altered twenty years hence. The acquisition of the piece of land on the other side of the road, together with the brick cottage on it, would be very desirable. If it were acquired, the workshop could be erected there, and that would allow of future expansion. It is desirable, but not necessary, to acquire this additional block at the present moment. The site already acquired, together with the area of some 6 acres on the other side of the road, should be sufficient to cover all possible requirements for the next twenty years. I am aware that the proposed ordnance and equipment stores are to be of galvanized iron and the ceilings are to be lined with wood.

There is to be a brick wall across the centre of the mobilization store, with bulkhead fire-proof doors. I think the mobilization store should be lined. A building in which saddlery and greasy leather are to be stored must be kept below a certain temperature. The climate here is warm during the summer months, and the walls, as well as the ceiling of this building, should be lined. A building with plain galvanized iron walls is not in the best interests of the Service, seeing that a lot of harness and saddlery will have to be stored. At the very least, one part of the building should be lined. As to the suggestion that adjoining the brick dividing wall a brick room 20 feet by 30 feet should be provided to carry rubber goods, I think that rubber goods should be underground, and that a proper storage cellar should be provided for the purpose. If any considerable quantity of expensive rubber goods is to be stored, cellar accommodation should be provided. That is in accordance with all that I have been taught. A clear overhead of 9 ft. 6 in. would cover any vehicle to be taken into the vehicle store. Coming to the question of water supply, the Mundaring scheme runs through the area, and I believe that there is an 8-inch main, so that we shall have ample pressure against fire. The plan shows that ample provision for water supply against fire has been made. A 4-inch service pipe will be quite satisfactory. A gravel floor for the vehicle shed would not be satisfactory. If gravel were used it would be necessary to lay down jarrah runners. A brick floor laid in sand or ashes would be satisfactory. A rammed ash floor with jarrah runners would be as good as any. Rammed gravel binds nicely, and with 6-in. by 3-in. or 8-in. by 3-in. jarrah runners for the wheels to run on, you would have a very good store floor. A brick floor at the present time would be expensive. We have had no trouble with white ants at Blackboy, but the country there is different from Midland Junction.

82. *To Mr. Mathews.*—The small-arms ammunition store must be kept cool, and I agree with the proposal to have a double roof—the outer of galvanized iron and the inner of asphalt with a wooden ceiling. I also approve of the overhanging eaves. If the funnel of a passing engine came under the projecting eaves, or in a line with them, there would be danger of fire. The funnel of the engine should be clear of the overhanging roof. It would, however, be only a passing risk, such as is taken by every railway building throughout the continent. The ends of the roof could be lined with gauze as a spark-arrester. To obviate the difficulty the small-arms ammunition store could be set back a little further from the railway siding and a wider platform erected in front of it. The funnel of an engine should by no means be allowed to go under the projecting roof. If the funnel passed outside it nothing more than the ordinary railway building risk would be incurred. For economy of handling, it is essential that the small-arms ammunition store should be close to the railway platform. A cover-piece over the ends of the eaves would give all the safety from fire that we require.

83. *To Mr. Moloney.*—I have seen the Midland Junction site in wet weather, and am perfectly satisfied with it. I have inspected it after the heaviest rains that we have had here for years. I see no reason to alter the present layout, but would advise the acquisition of the piece of land on the other side of the road in order to protect our interests. As soon as we commence operations the site will become a small centre of business activity, and it would, therefore, be advisable to acquire the additional area at the present time, when it can be secured at a reasonable rate, for

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future use. Another reason which weighed with us in selecting the Midland Junction site was its close proximity to the railway engineering workshops, which we would have to use in time of war. We should be dependent upon those workshops to do all our arsenal work.

84. *To Mr. Atkinson.*—The block of land on the other side of the road is not of first quality. It would require a little filling, but we should be able to obtain from the Midland workshops, alongside, ashes at a hauling charge of 1s. or 1s. 3d. per cubic yard. Two thousand loads of these ashes would make it a perfect piece of ground. We could commence building operations on it as it stands. There is a little pop-hole on the site, but it is not worth considering. I have been in this State for two years and three months, and have been over every defence property in it. The question of whether or not there is within a reasonable distance of Perth a better site than Blackboy for a permanent camp is a matter of personal opinion. If we were to go outside Blackboy it would be necessary to go to another central area in the vicinity of Spencer's Brook, Northam, which is 70 miles distant. It is an active centre, and, in my opinion, is too far out. I think it is very necessary that a small changing-room and lanching-room should be provided for the personnel. A building 20 feet by 20 feet would provide ample accommodation, and I certainly suggest its erection. My own view is that the scheme, as put before the Committee, is sound and ample, and the site selected is the best of which I know.

(Taken at Perth.)

THURSDAY, 20th JULY, 1920.

(Sectional Committee.)

PRESENT:

Mr. GREGORY, Chairman;

Senator Newland, Mr. Moloney,
Mr. Atkinson, Mr. Parker Moloney,
Walter Chapman Paton, Senior Ordnance Officer,
Fifth Military District, sworn and examined.

85. *To the Chairman.*—I have been associated with ordnance work ever since I left school, and have been connected with the Ordnance Department since 1877. I was stationed for many years at Sydney, where I was chief clerk in the Ordnance Branch, and I have been in full charge here since my arrival in February, 1916. The housing conditions for our material appear to have been adequate up to 1914, and until 1916 we managed to carry on by securing the Old King's warehouse, which gave us an additional 5,500 square feet of floor space. Early in 1916, however, it was found impossible to carry on, and the old skating rink in Hay-street east was leased by the Government. That gave us considerable relief, enabling us to sort our stores and to house them much better than before. Subsequently waggon began to arrive, and we had to transfer some of them to the artillery sheds at Guildford. Later on waggons began to arrive from the Old Country as part of our mobilization stores. We had to house some of them in the Lord-street drill hall, and the remainder have been sent to Blackboy Camp, where they have been housed as a temporary measure. We hope to transfer them to the new stores to be erected at Midland Junction, and thus to have all our material together. The fact that our stores are scattered at the present time places us at a great

disadvantage. I have the clothing store and the armoury in Museum-street. The drill hall adjoining has also been given over to us because of the pressure, and we have the camp stores and small-arms ammunition at Karrakatta. We have unserviceable stores housed in the Old King's warehouse at the corner of William-street and Mount's Bay-road, and the quick-firing ammunition magazines at East Guildford. We also have waggon, harness, saddlery, and accoutrements at Blackboy. The old premises at Hay-street east have been sold, and we have none of these stores on hand. It is necessary to maintain a staff at all these places except at the warehouse, Bazaar-terrace, which we use for the accumulation of unserviceable stores. I send a man to that warehouse now and again, and every half-year we sell the unserviceable stores. At times, therefore, we have none of these stores on hand. It would be wrong to waste them, because the material in them can be weighed out and, as we say, brought to "produce," or, in other words, classified, weighed, and sold. If we could concentrate our stores we should be able to economize in many ways, and the Administration would be helped. The field gun ammunition comes under my control; from bulk storage would be an ordnance charge. From an ordnance point of view equipment and mobilization stores are all part and parcel of the one charge. We must be ready for an immediate issue to troops in the case of an emergency, but at the present time we have not sufficient accommodation to set out all mobilization stores. We do not at present separate the ordnance and mobilization stores. They all go on the ledger charge. Before the war we required for ordnance purposes at head-quarters, that is to say, in Museum-street, Perth, 14,026 square feet of floor space, and 7,500 square feet at Karrakatta, and also at Karrakatta 2,600 square feet for ammunition, and 1,012 square feet for gunpowder which, of course, was kept in the magazine. The 2,600 square feet of floor space covered small arms ammunition requirements. The space occupied at the present time, inclusive of mobilization stores and everything under my control, is 41,978 square feet. I do not know what is to be the future scheme of Defence, so that I am unable to say that when things become normal I shall require much more space than I used before the war. Coming to the vehicle shed shown on the plan, I would point out that the vehicles must not be unduly congested. There must be room for the men to pass between the waggons, so that they may clean them, and turn the wheels from time to time. The ammunition floor space provided on the plan is satisfactory, but the office space is on the small side. I should like to have an unserviceable store provided at Midland Junction, because the Customs Department desire us to vacate the King's warehouse. I am only asking for an additional building 50 feet by 40 feet. It is not desirable that the serviceable stores should remain with unserviceable stores in the same building. The ordnance store alone, which will have 30,600 square feet of floor space, will not give me sufficient space. I shall want another 15,000 square feet quite apart from mobilization stores. An armoury will be required. The projected workshop is for something non-existent, so far as I am concerned. At present I have only one workman, namely, a sail-maker. The armament artificers are not under my control. If the projected workshop is built at Midland Junction we will not house the armourers in it. It will be used by artificers—blacksmiths and others. The officers who have provided for the erection of the workshop shown on the plan must be in possession of information which

I do not possess when they suggest the erection of so large a building. I may get instructions that the artificers are to come under my control. There would be nothing objectionable in having two authorities sharing the one area. We must work together harmoniously together. My principal concern is that my men shall be comfortably housed, so that they may be able to do good work. I want 6,000 square feet of floor space for the workman. I would have a large room, an office for the chief armourer, a browsing room, a drying room, a store room, and a forge. The ordnance store would not be sufficient in itself to include provision for the armoury. Clothing, harness, saddlery, and equipment will go into that store. The tentmaker will go into the mobilization store. We do not require much space for tent repairing. The ordnance store provides for a floor space of 30,600 square feet, in which I estimate goods to the value of £300,000 will be housed. We do not insure. We would not have a forge in that store. We should have a large room 18 feet by 18 feet in a separate brick building. The fires are always drawn at night so that there is not much danger attaching to them. I would have no objection to the armourers being placed in a separate portion of the workshop some little distance away from my store, but I think they should be provided for in the building where the ordnance stores are kept, because they are part and parcel of the whole scheme. Arms, accoutrements, and clothing are regarded by us as personal equipment, while tents, blankets, picks, shovels, &c., belong to wholly different sections. If the armament artificers are to come over to the ordnance section there will not be room for all the workshop for the armourers would advocate having a workshop for the armourers within the ordnance store itself, notwithstanding that the value of the goods to be housed in the store is £300,000. One-third of that stock will consist of arms. I have shown the Committee a rough sketch, not drawn to scale, showing the accommodation I should like. As to the drying room shown on my plan, after rifles have been brewed with a mixture they have to be placed in an air-tight room to dry. There is no provision in the departmental plan before the Committee for an oil and paint store. Such a building is necessary. I would suggest the erection of two caretaker's cottages instead of one, since it is too much to ask a man to remain constantly on night duty. With two men we should secure contentment on the part of the night watchmen, and they would be able to divide the night work between them. I am blessed with a contented staff, and it is possible to secure contentment and consequently good work only by extending to the men some consideration. In my rough plan I do not make any provision for a workshop outside the ordnance store. I thought of putting the armourers into the ordnance store. The figures shown on my plan as floor space requirements are correct. I was shown certain suggested sites, and I agreed that the Midland Junction site was better than the others for my purposes. Department. I regard it as suitable for my purposes. The special duties being briefly explained. A regiment of ordnance may be requisitioned for what it requires. That requisition is checked, and we make the issue. The method of issuing here is that all writs in the metropolitan area are notified that the goods requisitioned are ready for delivery. They then send for them, take delivery, and the responsible man in each unit checks and signs the vouchers. Goods are returned in the same way. We are notified that it is proposed to return certain goods, and we advise where and when they are to be returned. A responsible officer receives them, checks the vouchers, and signs for them.

Under existing conditions a motor car or general service wagon would be requisitioned for by the unit concerned to take away the goods issued to it. In the case of country districts we despatch by rail to the different units, advising the consignee of the despatch. The vouchers are sent to the units, checked by their responsible officers and returned to us. I have not the pre-war receipts and deliveries in tonnage. My books will show what I received into the stores in 1914, and I shall be glad to supply the Committee with a statement of the tonnage of my incomings and outgoing. The average ingoings at the present time are 1 ton per day, while the average outgoing is 1 1/4 tons. Such an estimate will cover us for some time to come. I can only explain the excess of outgoing over ingoings by pointing out that in some cases we handle the same goods over and over again. In Sydney, for instance, I had to stock tents which had been coming in and going out for twenty or thirty years. Our stocks before the war were not abnormal. Returning to the point as to the ingoings being greater than the outgoing, I would remind the Committee that there is a difference between expendable and non-expendable stores. A tent, for instance, is expendable, but a canvas cover, a keosene, a saw, oil, and paints would be non-expendable, and once issued would not come back to us.

86. To Mr. Mathews.—I have based this average of ingoings and outgoing on the transactions of the last two years. I have checked my figures.

87. To the Chairman.—I am quite satisfied that the rail and road communication with the site is all that could be desired. Small goods for the store will be sent by rail to Midland Junction, and delivery will be in the same way. The traffic arrangements are excellent. We have no motor lorries; at present I do not need any. Heavy goods will go direct to the store by rail. The greater proportion of our stores comes from Melbourne and Sydney. We have not obtained much lately from local manufacturers, but we formerly obtained considerable supplies from them when our stocks were low. We obtained much of our clothing and leather work locally. We invariably call for tenders here. I have a special order that all local manufacturers shall be notified whenever we are inviting tenders. We do not allow the calling of tenders to escape the notice of manufacturers. As a matter of fact, the Minister for Defence wrote over to us asking us to ascertain why local manufacturers did not tender for our supplies. This site will be fairly satisfactory for the delivery of goods from local manufacturers. If, for instance, we were taking delivery of leather goods from a local manufacturer to-day we should receive it at Perth, whereas when this scheme is carried out he will deliver at Midland. We do not propose to have an ordnance office at Perth. The chief officer must necessarily be at Midland Junction. I shall have to be there. I would prefer to stop in Perth not for personal reasons, but because my experience in Sydney convinces me that it is a disadvantage to be at some distance from headquarters. The store at Circular Quay was 3 miles from head-quarters, and when I came over here I discovered at once the value of having my store immediately adjoining head-quarters. I could control the business just as readily from Perth as from Midland Junction. There would be no duplication of work at Midland, and no excess personnel if I had an office at Perth. The office accommodation necessary at Midland to house all the staff would be 50 feet by 30 feet. I think it has been admitted that an error has occurred in providing on the plan for an office only 40 feet by 30 feet. At the present time, inclusive of myself, there

are fifteen men in the office, and it must not be forgotten that it is fairly hot during summer months at the Midland Junction. I shall not be able to reduce the clerical or office work when we have the whole of our ordnance work concentrated, because the same accounts will still have to be kept. So far as the store section is concerned, however, the concentration in Midlands must result in considerable economy. I have not estimated the probable reduction in expenditure, but I shall be glad to do so. The concentration of stores will be a gain. At present much time is lost by the men in going from one store building to another in different parts of the city. The saving in cartage to the Hay-street east building will counterbalance any additional expenditure involved in conveying the goods to the Midland Junction store. I am glad that the ordnance store is to be divided by a brick wall. With the exception of waterproof sheets, we do not store large quantities of rubber goods. Approximately the large quantities of rubber goods which represent the principal waterproof sheets which represent the principal rubber goods kept by me are of the value of about £2,000. They have not deteriorated in the Hay-street east store, which is an unlined galvanized iron building. The roof, however, is very high—it was an old skating rink, and we keep the sheets in the middle of the building, inspect them regularly, and powder them with French chalk, with the result that they are in very good order. Our harness is also in good order. I do not ask for special provision for the protection of harness and rubber goods. I would have preferred a brick building, but that I am told is not possible. I do not think that the walls and ceiling of the whole of the ordnance store should be wood lined. As to the suggestion which has been made to the Committee that there should be a brick room in the ordnance store for the storing of a rubber and leather goods, I would require 4,200 feet of floor space for harness, saddlery, and pack saddlery, and another 4,200 feet for accoutrements. A brick room 20 feet by 20 feet would be sufficient for the housing of my waterproof sheets. I should be quite recomended the provision of a cellar. I should be quite satisfied with a galvanized iron building for the housing of our harness and rubber goods provided that both of the walls and ceiling were lined. I should not anticipate any loss due to climatic conditions if the galvanized iron store were sufficiently lined. I have had under my charge explosives and small arms ammunition. I also have control of the magazine for field gun ammunition. I know something about deterioration of cordite. I am not an expert, but an expert on the staff regularly examines our cordite ammunition and furnishes a certificate. I should be quite satisfied to put all my small arm ammunition in an ammunition store erected on the site shown on the plan. It is all safety ammunition. I approve of the ammunition store being close to the railway line as shown on the plan. Detailed plans showing the construction of the building have not been submitted to me. I have not yet received a full list of the mobilization stores that are to come here, and cannot say what further supplies are anticipated. I am unable to say whether the proposed vehicle shed 300 feet by 100 feet will be ample for our requirements, because I have not been advised as to whether any additional waggons are to come here. In always dealt with mobilization and instructions to separate them. I do not know that they are to be kept separate. I do not think any danger may be apprehended from the fact that the funnel of an engine hauled from the siding will pass under the overhanging eaves of the ammunition store. We have had wags towing ammunition all over Sydney Harbor, and no accident

has happened. I do not think any more danger of fire need be apprehended than arises from an engine passing under a wooden bridge. There is certainly some element of danger, but it is not such as would cause me any concern. We have a chief armorer and four assistants. Their efficiency would not be impaired, if instead of working in the ordnance store itself they were placed in a workshop on the other side of the new roadway to be constructed. If the ordnance store were devoted purely to the housing of stores, and not used as a workshop, we should have more room, but I would prefer to have the armourers in the store, where they would be under my own personal supervision. We could have a forge outside the building; that would not constitute a risk. We have to observe the Fire Brigade Act, and an inspector from the Fire Brigades Board regularly visits our premises. The chief of the Fire Brigade Board here has not complained to me at any time concerning our arrangements, although we have a fire in the store. We keep a hose and a fire alarm outside the building. It would be wise to have sprinklers over our stores at Midland Junction. A sum of £30,000, I think, was expended in the installation of sprinklers at the Circular Quay building, and I know that on two different occasions sprinklers put in by private firms have avoided serious fires. There is a special apparatus attached to the sprinkler system and connected with the alarm bell which is tested every week by the senior fireman. The alarm bell also enables the efficiency of the sprinklers themselves to be tested. I would advocate the installation of sprinklers in this case, because I do not think there is any adequate local fire service. The workmen should be provided with a luncheon room. In round numbers we have fifty men in the office and stores, and they ought to be made comfortable.

89. *To Mr. Moloney.*—I think that the floor space for ordnance stores shown on the plan submitted to the Committee will be ample for all requirements, although, as you point out, it gives 10,000 feet less than the provision made in my rough plan. We shall want all the workshop accommodation shown on my plan. Having reconsidered the matter, I think it would be well to have inside the ordnance store as has been suggested a brick room for the rubber goods. I should still require, however, to have the building lined throughout with wood. Cellars generate untidiness, and are harbours for vermin and white ants. That is why I do not recommend that a cellar should be put in for rubber goods. This place is notorious for silver fish and moths, but my men take an interest in their work, and there has been practically no loss of stock in the Hay-street east building. If our rubber goods were stored in a brick room, their preservation would be insured.

90. *To Senator Newland.*—In my sketch plan I have divided the proposed ordnance store into five or six compartments by wire partitions. In that way we should be enabled to divide the store into sections, and allot one to each man and make him responsible for its care and upkeep. The partitions between the office, the browsing room, the store, and the drying room, shown in my sketch plan would be of wood. A very small room would be ample for the chief armorer. At the present time the floor space occupied by vehicles is 24,000 square feet. The vehicle shed shown on the plan would provide 30,000 square feet, and so enable the men to pass from time to time between the lines of vehicles in order to clean them, and to attend to the wheels, which should be turned at least once in six months. The Committee must add to the stock value, which I have given £22,000 in respect of vehicles.

The floor space of the vehicle store allows for expansion. I have asked for a building for unserviceable stores, and I should also like to have an oil and paint store 40 feet by 20 feet, right away from the other buildings. If it were placed on the western side of the site there would be no danger of fire so far as the other stores were concerned.

90a. *To Mr. Atkinson.*—It would not be possible to house in Perth all the ordnance stores necessary to meet an emergency at anything like the cost which the Midland Junction site will involve. Some time ago I selected what I thought to be ideal sites in the city. One was near the railway station, but it was too costly. No real advantage would be gained by having the ordnance stores in Perth rather than at Midland Junction. I want a floor space of 3,000 feet for the armourers' workshop, and 3,000 feet for the armoury stock I actually possess. The workshop proposed to be erected and shown on the plan will not be large enough to accommodate the armourers, artificers, blacksmiths, wheelwrights, and other workmen connected with the stores. It will be used by armament artificers who will require heavy machinery for their big work. It is for this reason that I prefer the arrangement shown on my sketch plan. I do not think it is intended to put the armourers in the projected workshop.

91. *To Mr. Mathews.*—When the erection of the ordnance store at Midland Junction was first mooted, I did not explain to my senior officers that I wanted my armoury workshop in the ordnance store itself. That point did not crop up. I had no doubt as to where the workshop would go. I think the projected workshop shown on the plan is in anticipation of the transfer to my charge of the armament artificers; but to provide me with any workshop outside the armourers at present is unnecessary. I have not a wheelwright, but should have one. I ought also to have a carpenter. I have a sailmaker who is called a tentmaker.

92. *To Mr. Atkinson.*—Everything in these buildings will be under my control. I am satisfied that they will be sufficient for my requirements for some years to come, subject, of course, to the erection of an un-serviceable stores room, the enlargement of the office, and the building of a changing and luncheon room for the men.

93. *To the Chairman.*—I was told that I was to be provided with an ordnance store 300 feet by 100 feet, including an armoury 100 feet by 80 feet.

(Taken at Perth.)

FRIDAY, 30th JULY, 1920.

(Sectional Committee.)

Present:

Mr. GAZDOUX, Chairman;

Senator Newland, Mr. Mathews,
Mr. Atkinson, Mr. Moloney.

John Digeon, Deputy Chief Engineer of Existing Lines, Western Australian Government Railways, sworn and examined.

94. *To the Chairman.*—I have seen the plans for the siding to be put in for the convenience of the proposed mobilization and equipment stores at Midland Junction. I produce a plan giving the grade of the line going to and from the site. It shows the grade of the existing railway and the proposed grade for the siding. The area is suitable for siding purposes. The siding

itself will be on a grade of 1 in 204. That is quite satisfactory. So far as I can see, it would not be possible to continue the siding for more than about three chains further south since our line runs level, and then falls 1 in 32. The whole ground falls away very quickly, and it would not be desirable to put in points on a steep grade. It would be possible, however, to continue the siding further north if it were found necessary to acquire more land in that direction. The grade would permit of that being done. I have had prepared an estimate of the cost of the siding, but as the cross levels have not been taken, it is only approximate so far as the earth-works are concerned. I have the levels of the ground along the existing line, and have based my estimate on them, but in the absence of sections I am assuming that the cross-fall of the country is level. That might slightly modify the quantity of our earth-works. The total estimated cost of the siding is £1,188. The estimate for rails and fastenings, on the assumption that the Railway Department provides them, and that 60-lb. rails are used, is £784. The rails on the Darling Range line are 46½ lbs. If we could provide 46½-lb. or even 45-lb. rails, they would be quite heavy enough for this siding, but as we have none in stock, I have made provision for the use of 60-lb. rails. We estimate them at £16 4s. 6d. per ton, so that the difference between the cost of 46½-lb. and the 60-lb. rails used in the siding would be only slight. Earth-works are estimated to cost £117; ballast and sleepers, £210; and laying the siding, £77, or a total of £1,188. When a siding is required, the usual practice is for the Department to lay the connexion with the main line. We lay the points and crossings so far as breaking the main line is concerned, but the construction of the rest of the siding may be carried out by arrangement either by the Department or by the other party. You ask whether, if it were necessary to take material in and out with great rapidity at a time of crisis, we could run direct on to this line from the Midland Junction marshalling yards. We would have to cross the main eastern railway line, so that I do not think there would be much gained, because operations on the one line would be hampered. The marshalling yards are on the other side of the main line. We could come in from the main Midland Junction yards. It would be quite feasible in time of war to run in a double line. We have direct access, and could have the ordnance store connected up with a double line within a very short period and at very little cost. I am familiar with the Blackboy Hill Training Camp. The railway grade there is 1 in 60. It would not be possible to have a loop siding on the main line there, because the grade is too steep to allow anything to stand on it. It would not fit in with our railway practice to put a siding on such a grade. A truck standing on the loop with such a grade would easily run away. In such circumstances we could only put in a dead-end siding, and that would be very awkward to work. This siding is 15 chains long. With a grade of 1 in 50 at the dead-end, we should have to excavate to the extent of 20 feet. That would be almost impracticable. This site fits in well with our railway system.

95. *To Mr. Moloney.*—Including the approaches, the siding from point to point will be over 20 chains long, but the approaches are not usable. Our estimates nowadays are high, because the price of materials is high. My estimate has been prepared in accordance with what are practically our standard prices.

96. *To the Chairman.*—On a fairly level country we should be able to construct a 3 ft. 6 in. gauge railway for about £3,000 a mile. That, however, is not a definite estimate.

97. *To Senator Newland.*—A connexion with the main eastern railway line would necessitate the erection of a signalling station. Busland Station is merely a stopping place. No man is employed there. In the event of the piece of land to the north of this site being acquired, you could have the full use of the line along the whole front. If the material were ready we could construct the siding in three weeks.

98. *To Mr. Atkinson.*—We would construct the siding by day labour. As a rule, the State Railway Department maintains all sidings, and it would be more economical for the Commonwealth to hand over the maintenance of the loop line siding to us, because we have the men on the spot. As to the shunting and other charges, I take it that this would come under the heading of a "private siding." The rent for right of access to the eastern railway branches is £25 per annum. There would also be a shunting charge of 2s. for a four-wheeled truck, and 4s. for an eight-wheeled truck. In addition, freight would be charged. There would also be a maintenance charge. We have our own inspector, and a ganger on the length, and we determine when anything needs to be done to a siding. If a siding got into very bad order we could not allow our trucks to go on it. We collect the maintenance charges from owners of private sidings, and carry out the work for them. We treat these sidings as part of the railway system, and charge actual time, plus 10 per cent. for administration, in respect of maintenance.

99. *To Mr. Mathews.*—Cinders are easily obtainable from the workshops. The abattoirs take a lot from us, but the Commonwealth would be able to obtain its share of them. We have at times an excess of cinders, although we use them largely in our own works. If earth were required for an embankment at the site we would have to go some distance, unless we used cinders, which would be the cheapest filling to use. The rails used by us in putting in this siding would most likely be second-hand. The cinders would cost, roughly speaking, from 1s. to 1s. 6d. per cubic yard. The price would depend upon the point at which they had to be deposited. Ten miles is the minimum distance freight charge. As to the overhanging eaves to the ammunition store, we allow our engines to go through our goods sheds and inside the workshops. I think that half-inch mesh at the ends of the eaves would prevent sparks getting between the two roofs. I admit that it would be possible for a spark to pass through a half-inch mesh. I think, on further consideration, that it would be wise, as you suggest, to put the ammunition store a little further back, and to widen the platform in front of it. We have a malthoid roof on the wool sheds at Fremantle, and Collicott sparks must have fallen on it from time to time, but there has been no outbreak of fire. There will be a danger of Collicott sparks falling on the roof of the ammunition store from a passing engine just as there is in the case of the wool sheds at Fremantle. It might be advisable to use fine netting at the ends of the roof in order to minimize the risk, but I do not think any serious danger is involved.

100. *To the Chairman.*—The only alternative to a brick floor for the vehicle shed would be an asphalt floor. That, however, would be rather expensive. Cinders make a good, but not a hard, floor. Cinders mixed with ironstone would make a fairly good floor for the vehicle shed, but it would become dry and dusty. A floor consisting of bluemetal covered with ironstone, but it would also be very expensive. Bluemetal would require a great deal of rolling, but would be better if mixed with tar. We have concrete floors in our workshops. A floor of second-hand railway sleepers would

be rough, but good. We have any number of such sleepers available at a cost of 1s. each. Such a floor would stand for a good many years, but would not last as long as a brick floor, and there would always be a danger of white ants being brought in with those sleepers. On further consideration, I do not think it would be economical in the long run to put in a floor of old sleepers.

101. *To Mr. Moloney.*—A mixture of gravel and tar would make a substantial floor, and, I think, it would be cheaper than bricks.

102. *To the Chairman.*—Gravel, or fine stone, costs about 10s. per yard, plus freight.

103. *To Senator Newland.*—I have assumed in my estimate that the ground across is level. If it is not, there may be more cutting or filling. I think the cross-fall of the country is level, and, if that is so, the cutting will just about provide the filling required.

104. *To the Chairman.*—The railway reservation at this site is about 70 links from the centre of the track to the railway boundary. The green line shows our reservation. It would be possible, from an engineering point of view, to keep the siding close to the green line shown on the plan. It would also be possible to build the siding on the railway land, but that could be done only with the concurrence of the State Railways Commissioners.

The witness withdrew.

Captain Ernest Andrewartha, Staff Officer for Engineers, 5th Military District, recalled and further examined.

105. *To the Chairman.*—A separate fireproof building of brick and concrete, 40 feet by 20 feet, will be required for the storage of paints, oils, petrol, &c. Our original intention was that the whole of the ordnance services should be concentrated at the Midland Junction site. The Senior Ordnance Officer may propose that there should be in Perth one small office for the issue of expense stores. I think it would be advisable for him to retain an office here, and also part of the store that he at present occupies, but not as the headquarters of the ordnance stores. You ask why it is necessary that any part of his work should be carried out at Perth. I would point out, in reply, that our regimental issues—small issues—are drawn by troops in Perth. After the first issue has been made, these consist of only small parcels, the rest are inter-changes. If transport had to go all the way to Midland Junction for very small parcels, or even if the parcels had to be sent by train, or delivery of them from contractors had to be taken at Midland Junction, a good deal of expense would be involved. It might, therefore, be convenient to use portion of the Francis-street building for the purpose, but certainly not to any material extent. The feeling amongst military men is that we should not concentrate any large quantity of stores at the Francis-street building, but use it only as a convenience. Such a convenience, if necessity demanded, could be done without, but it might be wise to consider the retention of a very small expense depot at Francis-street. The projected workshop, 100 feet by 60 feet, shown on the plan, would be used as a carpenter's shop, a blacksmith's shop, a machine shop, and by tentmakers, wheelwrights, and, perhaps, a plumber. These men will be under the control of the Inspector of Ordnance Machinery. He is the chief, but the whole work should come under Ordnance. There should be a workshop supervisor to co-ordinate the work as between the ordnance store and the workshop. That co-ordination is essential to successful working. The sug-

gestion is that a portion of the north-end of the main building be partitioned off for an armourer's workshop. A forge, however, would not be attached to the main building. An additional forge, or fireplace, could be placed in the workshop for the use of the armourers. They have not a great deal of forge work to do, but it would be a mistake not to provide an additional forge in the workshop, which could be used by the artificers when required, and also by the ordnance men. Very little forge work is associated with rifle repairs. It is mostly machine lathe and office work that has to be done, but we need to have in the workshop a forge for the use of the armourers. We do not intend in any circumstances to have any fire work in the main building. All the fire work will be done in the workshop, outside the main building.

106. *To Senator Newland.*—I think it absolutely necessary that there should be a browsing room and a drying room, and also a small office, where the chief armourer will be able to keep records of his ingoings and outgoing. There is no risk attaching to the browsing room. Our proposal is that it shall be in a corner of the main building, so that the fumes may be blown right through and not enter the store. We propose to partition off a small store room, an office, and a browsing and a drying room, each 12 feet by 12 feet. This accommodation is necessary to insure the safety of records, a drying room to be used after the keeping of records, a drying room to be used after the acid bath, and a browsing room for the browsing work. In this way we should take off 3,200 feet, or two bays, from the main building. That would still leave sufficient room for the remainder of the stores. The original plans made provision for these rooms in a detached building. They provided for a brick armoury; but I believe the proposal now made will satisfy all requirements. No difficulty will be involved in carrying the work to be done from the ordnance store to the proposed workshop. The parts of small arms and machine guns that have to be repaired or altered are not heavy, so that no hardship would be imposed upon an artificer in requiring him to carry his work from the store to the workshop where the forge was placed.

107. *To Mr. Mathews.*—As to the suggested retention of a small ordnance office at Perth, I do not think that in time of war ordnance office accommodation would be established at the barracks. My own view is that militia units should be placed in the buildings at head-quarters, which are to be vacated on the erection of these stores. The only big building that we have at head-quarters is the present pay office, and it would comfortably house and provide for all the office work of an army service corps company. We have the Army Medical Corps scattered in offices in Lord-street. It would be wise to concentrate in the pay office the departmental units that are working near Perth at the present time. Our district activities are now scattered about the city, but, I think, we shall bring into the barracks all those associated with our district. It does not relate to my branch of the service, but that is what I think will be done. That is the feeling of the general staff. The present pay office is a temporary building erected during the war. The main barrack annexe is an infantry drill hall in peace time, and the present clothing store is the artillery drill hall. There is no building at head-quarters which could be used for ordnance purposes. We have the Militia Field Artillery at the barracks, and the Garrison Artillery at Fremantle. We have no permanent field artillery here. The building in Museum-street, now occupied by the Ordnance Department, is Commonwealth property, and could be used as a small expense store.

You ask whether the proposed new ordnance store is not too costly a building to warrant 3,000 square feet of its flooring space being used as an armoury work shop, a drying room, and a browsing room. I would sooner sacrifice a portion of the main building in that way than have little caches. As soon as we get away from the section system we are faced with many disadvantages.

The witness withdrew.

James Macfarlane Lapsley, Chief Officer of Fire Brigades in Western Australia, sworn and examined.

108. *To the Chairman.*—I produce the waterworks plan of Midland Junction. There is a 16-inch main on the York-road. The Mundaring main is not reduced to 8 inches until it gets near Perth. This 8-inch main is fed by the 16-inch main, and the 4-inch service pipe which it is proposed to put round these buildings will provide an ample pressure of water to deal with an outbreak of fire in any of them. I have not been consulted by the authorities in regard to this matter. Having examined the plan I think that a 4-inch service main should be the minimum. Usually when large buildings are being erected contiguous to the city my opinion is sought in regard to the precautions to be taken against fire. When the Blackboy Camp was being established I was called in, and recommended the provision of underground tanks with manual fire engines. I report on all the Commonwealth buildings in this city. So far as I can judge the buildings to be erected at Midland Junction will be fairly well protected from fire risk by the provision of a 4-inch pipe as long as there is an ample supply of hose kept in boxes protected from the weather, and standpipes erected at intervals as shown. I would recommend, however, the installation of two fire alarms communicating with the Midland Junction station. Only one line would be required for the two alarms. We have four permanent men at the Midland Junction Station—two firemen and two watchmen for the railway workshops. There is a permanent brigade at Midland Junction. We have not a tell-tale clock system at Midlands. We look upon clothing as dangerous, but when it ignites it creates so much smoke that it is not consumed so readily as is any flimsy material. We always recommend the installation of sprinklers. It is advisable to install them wherever possible. The actual situation of the alarms which I have suggested can be determined when the buildings have been erected. The location of the paint, oil, and petrol store is immaterial, as long as it is detached from the main building. It should have an ample supply of chemical fire extinguishers.

109. *To Mr. Mathews.*—I think it should be possible to have the projecting roof over the ammunition store closed at the end overlooking the railway line. It is not a big fire risk, but it is certainly a bad one. I have had no personal experience of malthoid firing, but there are records of its having fired. Dried horse manure and other litter might be carried by the wind between these two roofs and lodged there, and it would need only one spark to ignite the whole of it. I think, therefore, precautions should be taken to reduce the risk. I would cover the ends with perforated iron, rather than set back the building a little further than is shown on the plan.

110. *To Mr. Moloney.*—Even with a curved projection the sparks would be liable to get between the two roofs. If the building were set back some yards from the railway line a spark from an engine might nevertheless blow between the roofs. It is impossible, therefore, to make the building fireproof.

111. *To Senator Newland.*—We have, in Perth, only a few buildings fitted with sprinklers. Among these are the premises of G. and H. Wills, Sargood Brothers, Sandover's, and the Swan Brewery. The sprinklers at the Swan Brewery gave us some little trouble at the start, but we have no cause for complaint. We examine the sprinklers periodically, but do not test them with fire to knock away the head in the sprinklers. I have not heard of sprinklers refusing to act, but I believe there are on record a few cases where they have failed to act in England. Those failures, however, have been traced to want of water—the water supply having been turned off. Where storage tanks are put in there can be no possibility of failure. It would be necessary in this case to erect storage tanks in order to guard against any trouble with the mains. When an outbreak of fire occurred a main might be turned off because of repairs to be effected to it.

(Taken at Perth.)

SATURDAY, 31st JULY, 1920.

(Sectional Committee.)

Present:

Mr. GARNETT, Chairman;

Senator Newland, Mr. Mathews,
Mr. Atkinson, Mr. Moloney.

Louis Monck, Chief Armourer, Defence Department, Perth, sworn and examined.

112. *To the Chairman.*—I have been in the Ordnance Department here from its inception, having been in the service for 27 years. I submit to the Committee a rough plan, not drawn to scale, showing my requirements in respect of the armoury area a general store, office, drying room, store room for tools, &c., a browsing room, fitters' shop, and store room for machine guns. These cover an area of 100 feet by 31 feet. I submit to the Committee the following letter, addressed by me to the Senior Ordnance Officer:—

Ordnance Department, 6th M.D.,
Perth, W.A.,
26th July, 1920.

The Senior Ordnance Officer, 6th M.D.

Sir,—Herewith attached, I beg to submit a rough plan, not drawn to scale, which, in the interest (now and for the future) of the Department, is, to the best of my belief, minimal. The space as shown in plan, I am unable to further minimize, which may be seen by the cramped conditions, now existing in the armoury. In 1911 the store rooms of the armoury section numbered three of a total floor space of 192 running feet by 29 ft. 0 in., inside measurement. At the present time the stores generally have trebled. The store space now used, and packed with stores, which is not in accordance with regulations, being carried out under the present condition of congestion, is 325 ft. 6 in. running feet by 73 feet, approximately. Therefore I trust, in the interest of the Department, my suggestion may receive favorable consideration.

In support of same I would respectfully submit the following reasons:—
1. The concentration of rifles in a general store in close proximity to the armoury works. These rifles, as stored, must be examined every six months by the experts of the armoury section. (See Regulations, O.S. Services, page 18, paragraphs 125 and 128.) Each rifle must be removed from the chests and 125 examined. The chest is removed from the stack and wheeled to the workshop. If the barrel or furniture of the rifle has deteriorated in any way, the cause has to be removed by the armourers. (See Regulations, O.S. Services, page 18, paragraph 125.) The records of all rifles are then made, and submitted to the S.O.O. by reports from the Chief Armourer, for registration.

In the case of part worn rifles, these must be examined every three months, to obtain the cause and result of nitric acid. If neglect in this case is permitted the result is disastrous.

This store room should be thoroughly damp-proof, and constructed of brick on stone, and celloided, to prevent the damp arising from an iron roof or from any condensation on the ceiling. (See Regulations, O.S. Services, 1910, page 10, paragraph 132.)

2. The issues are made by those thoroughly conversant with the various marks, designs, patterns, &c., especially with regard to part worn equipment. The person must have a full knowledge of the condition and use, viz., of the Chief Armourer or his Senior Assistant. (See Regulations, O.S. Services, 1910, page 10, paragraph 127.)

3. Revolvers.—These are subject to 1 and 2.

4. Machine Guns.—These should be under strict certified expert. The furniture, in all cases, of machine guns is of a scientific nature—in some cases delicate and such should be in close connexion with the workshop to enable the gun (often of a cumbersome nature) to be wheeled into the workshop for immediate repairs. To a large number of cases, to effect the repairs, machinery is often needed. (See Regulations, Changes War Material.) Bushing of tripods, manufacture of elevating and cross-head pins, pins generally, strengthening pieces, cross-head, see Regulations, Changes, 1909, 1st October, 1901, and 1907, 1st November, 1901; also, O.S. Services, page 18, paragraphs 116, 110, 117.

5. Repairs, browning, bluing-of-rifles, machine guns, component parts, sword bayonets, scabbards, fitting of the wood furniture of items, as in 1, 2, 3, and 4, should be in close proximity to the workshop. The general store and machine gun store will be notified on plan, and will barely suffice for all as set out in the foregoing.

6. Components.—In the case of these articles, one and all should be under the direct supervision of the Chief Armourer. Take, for instance, shipments as supplied. These must be checked, examined, and certified to by the armourers. (See O.S. Services, page 19, paragraph 127.) There are so many of various patterns, designs, marks, and similarities that none but a certified person could negotiate with, particularly with receipts and issue. All issues are made on a workshop requisition, and forwarded to the S.O. for registration.

The above remarks, though but few of many which could be made in support of such a building and floor space, which is, in my opinion, absolutely necessary, I beg to submit. Attached is a list of a few articles manufactured in the armoury, which has always been maintaining in the 5th M.D.

A list of machines will also be found attached. These machines, which are now in the workshop, are in constant use. I would point out one item of many is now waiting execution, viz., 84 Lewis guns, 72 Vickers guns. I would point out with reference to the machines. These being properly laid out, and distributed according to factory regulations, will take up one-half of the space as shown on plan, also with conformity to and with the perfection to lives (engineers) and the execution of manufacture and repairs.

List of articles manufactured and repairs. This will show the various sizes and the approximate space required during execution. The staff consists of four armourers, with four benches. It is imperative that the necessary room for each workshop, I most emphatically state, in the interest of this Department, the space as shown on plan is necessary. This does not show any provision for temporary assistance, when necessary, by the Department.

Forges.—Remarks on this, I presume, will be unnecessary, suffice it to say, this must exist.

Browning Room.—Remarks on this also, I think, unnecessary in detail, as it will be clearly understood the nature of this work with acids and the temperature required.

I beg to state, I have no wish to go beyond my province; if I have, it must be understood it has been an expert; but in the interests of this Department, taking into consideration the very serious nature of the proposition.

I beg to leave any future responsibility in the hands of my superiors.

Finally, I would especially draw your attention to the following regulations, Ordnance Store Services, 1910, Index—

- 40. Browning. Paragraphs 144 to 202.
- 41. Packing. Paragraphs 146 and 147.
- 44. Machine guns. Paragraphs 148 to 153.
- 44. Marking. Paragraphs 148 to 165.
- 45. Packing. Paragraphs 129 to 132.
- 45. Receipts of stores. Paragraphs 171 to 170.
- 46. Repairs. Paragraphs 140 to 172.
- 46. Reports. Paragraph 171.
- 46. Rifles. Arms.
- I beg to remain,

Yours respectfully,
I. Moxey, Chief Armourer, 5th M.D., W.A.

LIST OF MACHINES IN MACHINE SHOP.

Motor, two-horse, with pulleys and shafting; revolving drum for cleaning and burnishing; grinding machine; saw-bench, for wood or iron; lathe, engineer's, universal; 4-ft. bed, with planing machine, and polishing head; hack saw machine; lathe, engineer's, screw cutting, 4 ft. 6 in. gap bed; drilling machine, universal; pipe-cutting machine; spinner, for testing rifle barrels; vice, factory, two, M.L.E., M.E., 230 inches, 310 inches; plate, setting, 4 feet 2 feet; universal lathe, with bellows. All the above carrying racks for tools and fixtures.

CLASS OF WORK EXECUTED IN ARMOURY, 5TH M.D., W.A.
Instruments, killing cattle, with mallet; carriers, gun, Maxim, 303 inches (hangers); manufacture of saddle trees, musket fencing, periscopes for trench work; air correctors, revolving drums, for cleaning and burnishing, splines (inspection of barrels), tools (smith's), screws, fixing crank handles (gun, Maxim), cover spring lock (gun, Maxim), bayonets, fencing with key holes and keys (tents), special spring for scissors (operating, medical).

Repairs and overhaul of cookers (Field Service), G.S. wagons, tool cases, overhaul of bicycles, forges (Field Service), scales (weighing), stretchers (ambulance), lamps (folding), painting kitchen (travelling), hand trucks, motors and life, field glasses, registration and date stamping machines, camp kettles, dishes (cooking kitchen; travelling; wagon), field forges (fitting new bellows).

Converting 100 M.L. rifles to musket-fencing.
Converting 3 Mark III. field forges to Mark IV, plan, original.
Cleaning and burnishing, fittings, and furniture, to harness and general equipment.

Repairing, assembling, fitting, breeching-up, browning, and impoaching, also examination of the following—Rifles, 303 inches, 230 inches, 310 inches, 22 inches R. tubes along. Repairing all machine guns, carriage; machine guns, 303 Maxim, 303 inches; gun, Vickers, 203 inches; gun, Lewis, 303 inches; gun, Hotchkiss, and other machine guns, generally. Repairing machine-filling bolts of all descriptions, tubes (storing); pistols of all calibre, marks, patterns, and designs; bayonets and scabbards of all patterns, swords (officers and staff sergeants); scabbards (officers and staff sergeants).

Marking and stamping, all small arms, and machine guns. This—in a large number of cases outside firms have refused to tender for repairs and manufacture. As this is executed in the armoury by the armoury staff. All work is accepted, and none turned away that may be executed in the works of an engineering firm.

I. Moxey, Chief Armourer, 5th M.D., W.A.

The armoury should be of brick or stone, as a precaution against dampness. Corrugated iron is very unsuitable. During frosty or damp weather it weeps, or sheds water, and we need to be protected from that to kind of thing. The delicate parts of our guns—that is to say, the actions—are burnished, and, if subjected to dampness, will quickly become rusty. A corrugated-iron building, thoroughly lined with jarrah, and with a painted wooden ceiling, would be a protection against dampness. There should be a space of 12 inches between the jarrah ceiling and the roof. I am asking that the armoury should be in a building in which our guns are to be stored, instead of in the projected workshop, because it should be close to the work to be carried out. If the armoury were not adjoining the store, my staff would be separated, and this would not mean a saving to the Department. The steam and fumes from the firing of the ordnance stores. We use acids, and fumes would float all over the building. I have vans or boilers in which to boil the mixture, and the steam from these, carrying with it the acid fumes, which are detrimental to any store or store equipment, would float so to speak, all over the place. The fumes should be carefully carried away. There should be thorough ventilation, and I would suggest that louvers be put in the browning room to carry off the steam. The browning room and the drying room should have a whitewashed jarrah ceiling. The whitewash acts as an antidote. If the acid rising from the browning room reached the

general store, they would cause the goods housed there to immediately deteriorate. Foodstuffs, clothing, and leather, for instance, would be detrimentally affected. In my opinion, it would be better if the armoury and the building in which the machines are to be used were kept separate from the remaining rooms. Experts in England consider the South African ordnance store a model building. It is of brick, and is fully 100 feet away from any other store. If I have a rather cumbersome gun to repair, I like to have it near the machinery. It would be absurd to have such a gun 40 or 50 feet away from the machine room in which it would be repaired.

113. To Mr. Mathews.—It would not be sufficient for my purpose to have the drying room, the browning room, and the forge in a separate building adjacent to the armoury. I claim that the whole of the rooms associated with my work should be built of brick. Shortly put, my general store and its adjuncts should be of brick. Mr. Paton is my superior officer. I have full control of the armoury. When the proposal to erect a new ordnance store was made, I was not consulted as to my requirements, except by Mr. Paton. I should like to have the forge outside, but adjacent to the workshop. The drying room and browning room would have to be divided from my general store room by brick walls.

114. To Mr. Moloney.—I do not think it would be sufficient to set apart for my purposes a part of the corrugated-iron ordnance store provided for in the plan, and to completely wood-line that part of the building. I am emphatic on the point that a separate building is necessary. Dampness would penetrate the wood lining of a corrugated-iron building.

115. To Mr. Atkinson.—The fumes of which I have spoken would eat away the galvanized iron. The iron would become rusty, and would gradually go to pieces. Out of the total floor space of 50,000 square feet to be provided for the ordnance store, I hold that 6,000 should be set apart for my services, and should be in a separate brick building. In such a building I would have an aerial escape for the fumes. I should not be satisfied to have part of the ordnance store bricked off for the armoury. I object to a brick room being built inside the main store for that purpose. No man who understood the effects of these fumes on general stores would advocate the setting apart of portion of the ordnance store for an armoury. I do not think it would be satisfactory to have, for the use of the armourers, an additional forge in the proposed workshop. I could not carry on without a forge, and I would have it immediately adjoining the armoury workshop.

116. To Senator Newland.—I have no use for a blast furnace in connexion with my work. I am now working in a brick building, but it has nothing like the conveniences for which I am asking. The building I am using was originally occupied solely by my staff, but two rooms on the second story have since been taken over, and are used, one as an office, and the other for the storage of clothing. The fumes are having a bad effect on the building. My present browning room has been condemned. The fumes have an ill-effect on the workmen. As soon as they begin to feel the effects of the acid, they leave the room. They cannot remain for any time in the browning room, because the steam becomes too dense. Work is constantly being carried out in that room. I have 10,000 rifles, 200 guns, and about 200 revolvers which require browning. An arm may require to be browned after only six months' use; in some cases it may be used for six years before browning becomes necessary. The forge room, originally shown on my rough sketch was marked out by Captain

Andrewartha. It would be sufficient for my purpose to have a forge adjacent to the armoury workshop. Under my proposal, all rifles and guns would be stored in the armoury, instead of in the ordnance store. I have to combat steam as well as acids in the browning room. It would be immaterial to me where the store that I suggest was erected so long as it was near the railway siding.

117. To Mr. Atkinson.—I think the floor space of 6,000 square feet, for which I ask, will provide me with ample accommodation for the present, and allow for the storage of rifles. Ten years hence we should, in all probability, require more accommodation, and the building I suggest should be so constructed as to permit of extensions. There are brick kilns at Bellvue, which is close to Midland Junction.

(Taken at Melbourne.)

TUESDAY, 10th AUGUST, 1920.

Present:

Mr. GERRARD, Chairman;
Senator Foll, Mr. Mackay,
Senator Newland, Mr. Mathews,
Senator Plavin, Mr. Moloney,
Mr. Atkinson,

Charles Hector Sutherland, Armourer, Victoria Barracks, Melbourne, sworn and examined.

118. To the Chairman.—I have held my present position for fifteen years and some nine or ten months. I am not the senior officer, but the second senior. The senior officer, Mr. Drupe, is retiring, at the age of 65, in December next. I had previously no experience of such a position, my occupation being a carpenter. During the Boer War I received a practical knowledge of armourers' work. In Melbourne at the present time there is a staff of fifteen, but we are losing men every year, eight or nine having left and another leaving this week. The full staff would be about 22, but positions have not been filled recently, only temporary men being taken on. In Melbourne we receive new work as well as repairs. Before the war we did the repairing to the arms issued to the Citizen Forces—machine guns and all other kinds of arms—but we did not touch field guns or artillery work. All the rifles for the 3rd Military District imported or made in the factory come direct to us. We open them up and clean them from the coating put on the articles to preserve them during transport. We examine them, and mark them from No. 1 upwards, so that they might be traced if lost. Rifles come back from the rifle clubs and field forces for repair. We are not doing much browning at present, because practically all our rifles are overseas. The rifles do not require much browning, because the barrels are covered with wood top and bottom, and very little steel work is shown. As to any danger arising, either to the proposed building itself or to the goods stored in the adjacent buildings for the work of the armourer, browning means a certain amount of steam, just as it is found in a home on a washing day. There is a certain amount of vapour from the nitric acid which is used. Browning is done by rusting and rubbing off until you get a blue surface on the face of the steel, and this takes four or five days. It is advisable to keep all steel away from the fumes. I could not say what would be the result in the case of leather work or drapery, but I fancy it would not be good for leather. In Melbourne our place is quite distant from the stores; we are really in

a little corner, with no other stores near us. Steel parts and other requirements for the armoury workshops should be kept well away from fumes of this kind. The fumes can be easily taken away by a proper system of Board of Works' ventilators in the ceiling. In Melbourne the rooms later built are well ventilated, but the original rooms built sixty years ago, are not. I have been at the New South Wales place, but I do not know where the browning-room is there. But whatever is essential here is quite as essential there, for that District is as large as the Victorian District. It would be advisable, in case of fire, to have the browning and drying rooms separated from the other rooms by cement or brick fireproof walls. If in Perth there will be £300,000 worth of goods stored, there will be a big risk, unless proper precautions are taken. It is wise on the part of the armourer in Western Australia to desire to have this armoury close to where the rifles are stored, so that he can get the work easily. I do not see why the drying and browning room should not be put alongside the forge. There must be provision for protection against fire at the forge, which is really more dangerous in this regard than the browning-room; the browning fire is under a stove, whereas the forge is an open fire. We do not necessarily have fires in the drying-room or in the browning room; in browning we have found the room warm enough. I could not speak in this regard of Perth, of which I have no knowledge, having been there for only a few hours. The building we occupy in Melbourne is wood-lined, and has a stone floor. I have done browning in my own house with pistols and other small articles, for which it is only necessary to have a little cooking pot. There has to be heat for the articles must be boiled for half-an-hour. An armourer has first to strip the rifle, take off the wood, and separate the parts, which have to be carried to the browning-room, and then back again for re-assembly. For this reason the browning-room must be somewhat close to the workshop. Rifles should not be stored in the workshop; stores should be kept separate. It would not matter if the buildings were separated by 100 yards, except for extra handling of arms. I would not object if the store was at one end of the building, but there must be plenty of space for divisions. I am against the rifles having to go a distance of 60 feet. We have too much carrying rifles where we are. A chest of rifles is about 3 cwt., and unless you have trucks, it means two men to carry a chest, and this is not advisable in dusty or wet weather. I should like the workshop to be somewhere adjacent, so that a man can put the chest on a truck and run it to any part of the store and back again. I would like the armoury to be within the store, and it might be placed at the end of the proposed building, with the protection against fire I have suggested. It all depends on the position of the building. Light is essential, and it is desirable that the windows should face the north, unless the heat is too excessive. In Melbourne the building is an old stone one, and the light is bad at times. The building I work in mostly faces the south, and we get no sun except on summer afternoons. I have no objection to the drying and browning room being in the workshop, 100 yards away, except that the men would have to carry the rifles there and back. Oil blacking is a cheaper and quicker form of browning, and is used for ordinary parts of rifles, like screws. This form of browning, however, is not lasting. When a shipment of rifles comes in, or a consignment from the factory, they are kept away from the rifles already in the store, to avoid them getting mixed. They are opened, checked, and marked, and then wheeled into the general store, and put into

stock. I do not think that the armourer in Western Australia has made any provision for a receiving-room, and he probably contemplates a corner of the store-room. I suggest that there should be a receiving-room, and also a despatch-room. That would be part of the general store work. If the Committee recommend that a brick wall should divide the armoury from the general store, with a doorway to give communication, it would improve the conditions; brick or cement, whatever was the cheaper, could be used for the wall. I have been considering how to improve our own place, for it badly needs improvement, and it is a much bigger establishment than is proposed at Midland Junction.

119. *To Mr. Mathews.*—I understand that the armourer at Midland Junction is asking for a place 100 feet by 63 feet, or thereabouts, or 6,000 square feet. In Melbourne our present storage is 13,515 square feet.

120. *To the Chairman.*—That includes the workshop, the forge, and everything, but the space is not adequate for our requirements, and we are pushing out other departments, and utilizing their sheds. We require at least 15,300 square feet. At present we have stuff in the yard, covered with tarpaulins. The roof is iron on the back portion, and we are storing rifles in iron sheds, which are quite unsuitable. The buildings face north, and on a hot day they are like an oven. An iron roof draws the heat, and the atmosphere inside, being hot and moist, tends to warp the stocks and cause rust. I am speaking now of the low building. These buildings were originally for camp equipment—tents, shovels, and so forth. The sheds are only about 9 or 10 feet high at the low side, rising to 15 feet or 17 feet skillion-wise. I certainly think that special buildings are required for the housing of small arms, for they are valuable, not only as regards their expense, but as things which the nation may require at any time. There ought to be large well-ventilated buildings. The drying process would not appreciably affect iron roofing, because, in any case, a wooden ceiling, with proper ventilation, would prevent any ill-effects. I do not look upon it as essential to have a tiled or slated roof, in view of the amount of browning that requires to be done. Rifles change like the fashions. There will be less work to do at Midland Junction than there is in Melbourne.

121. *To Senator Newland.*—Rifles are "sentenced" to be browned, and then they are stripped, and every screw and part removed and taken to a large copper and boiled in caustic soda to remove all oil inside and out. Oil in any part prevents the rusting of the surface, and thus prevents proper browning. After the boiling they are washed in warm water to remove any caustic soda, then boiled, and, while they are hot, coated with the browning mixture. Every nation has a different system of browning, and the British systems are good, especially the B.S.A. system, which I prefer as leaving a beautiful blue-brown, which stands. We have some rifles that have been in use fifteen years, and others eight and ten years, and the browning is good yet. We apply the browning mixture with a brush or mop, and, while warm, the steel work is stood up in the drying room. The heat in the metal is sufficient to dry them. We shake off any superfluous moisture while the metal is hot. You coat them when they are hot, and after two hours, or whatever time is fixed, the metal is probably boiled again. Then you take the parts out, and let them stand until cold, and re-coat and boil them again. Then you give a scratch sand, similar to that with which rifles are cleaned, in order to scratch off all that you have put on, and make them bright. You continue this treatment until the

metal is so finely rusted and scratched until it becomes blue. The process takes four or five days to complete. It does not take that long to do a single rifle; but it takes four or five days for each barrel; two men may treat 100 barrels in a day. Then, finally, the metal is wiped and oiled to prevent the process going any further. The B.S.A. process is expensive, but it is the best; the Lewis guns are thus browned. All the time this process is going on the men are working in the fumes from the boilers, and so forth, but I do not think that it is injurious to their health. I have never heard of any complaints on this score, but we have not done such a great deal of the work. Rubber finger stalls are worn to keep off the acid. Personally, I have never known men of the case work in the browning room on account of the action of the fumes. The rooms are not closed, and there can be ample ventilation; though, of course, it is a warm, moist atmosphere, in which the necessary rusting is more quickly accomplished than in a cold, dry atmosphere. There may be some difference in the respect between Midland Junction and Melbourne. We have not done any browning lately at Victoria Barracks. So far, the rifles that have come back from the war do not require much browning; the browning seems to be in good order, and, so far as I know, the guns have not had any great wear. Probably during the war they were painted to cover the browning. We have not had many machine gun barrels under review since the war. I deal with twelve just recently, but I do not think they had done much in the war. If there was a piece of browning chipped or rubbed off a machine gun barrel, that barrel would rust back again, and used without deteriorating it; it would not rust if oiled. A light coating of rust would help to hide the chip, and would be no detriment. Machine gun barrels are kept in water in some cases when in use, as, for instance, the Vickers' guns; whereas other machine guns are air-cooled. One reason why we have not so much browning to do is the change in the issues of the guns. The old M.L. rifles were in use for many years, and we did considerable browning in connection with them; but they were superseded by the M.L.E. converted rifle. These were superseded by the M.L.E. short rifle magazine rifle, and later by the M.L.E. short rifle Mark III, which, in turn, is being superseded by the Mark III*, the latest rifle. The rifles are not in use long enough for them to require re-browning. If the Mark III* stays, it will require re-browning in a few years. The men are leaving the staff in Melbourne to better themselves, or on account of their age. The 10,000 feet space we require is really for the repairing and storing of the rifles and machine guns in our own armoury. The rifles should be somewhere close, so that the armourer can keep his eye on them. There are many different grades, the distinctions between which our storemen are not sufficiently qualified to know and they may put them under the wrong headings. That, however, is not a very serious fault, except that it makes the ledgers inaccurate. If the Defence authorities decided to store large quantities of rifles at Seymour, or any other large Ordnance store, that would relieve the pressure on our building considerably. If all the rifles were sent to Seymour we should require only a small repair shop and store. The rifles should be examined at least every year, when they are out on issue, but for the last five years no rifles have been issued to the Citizen Forces. We go through them whenever we have time, and we have only just done so. They must be inspected every year in stores

in order to see that they are not deteriorating. I am satisfied that an iron roof would be suitable for a browning room, but iron walls would be too cold for rusting, and, perhaps, too cold for men to work in, particularly if there was a stone floor. My objection would not be on account of the acid fumes, but on account of the unsuitability of the building for the work.

122. *To Mr. Moloney.*—I would like the store-room and workshop in one building; I mean a store-room for small arms and machine guns. I cannot say definitely as to the effect of the fumes on galvanized iron, but I should think that, in view of the small quantity of browning done, there would be no effect. If the work of browning extended I do not think the fumes would prove any detriment to the galvanized iron if there was a ceiling with proper vents to carry the moisture through. I would recommend that the armourers' forge be somewhere near the workshop, adjoining the workshop. There is less browning to be done on the Mark III rifle than on the older rifles, but in another two years, there may be a new rifle which will call for more browning. The buildings in Melbourne are obsolete, and I do not think that the Committee could learn much by inspecting them, though they might see something in the more modern store-rooms that have been erected at the barracks. The store-rooms for saddlery and leather, and clothing, built during the war, are of iron, and I do not think that they are either too hot or too cold. The chemical that affects the steel in the browning process is nitric acid; but it is not used in large quantities, being just smeared over the surface with it. It is difficult to say how fumes travel. If you have a large quantity of material rusting, and it is against a galvanized iron wall, it will, no doubt, in time, take the galvanizing off. There are certainly fumes from nitric acid, but not such as one may see from a cigarette, for instance; however, what causes rust to one thing will cause rust to another adjoining. With the small quantity of browning that is required we only want proper ventilation.

123. *To Mr. Mackay.*—The plan submitted to the Committee is not the one, perhaps, that I would pick out myself, though, of course, it may be better than one I should devise, because I have not gone very deeply into the matter. I see that the armourer probably requires two rooms, one for browning and one for drying; whereas I think that one room would probably be sufficient. However, the requirements depend largely on the policy of the Government. I do not observe that the armourer has provided any store-room for his screws, springs, and so forth, and I suppose he intends to keep those separate parts in the office. I suppose that the large store-room is to accommodate the tools; we require a room for tools apart from the stores, for there are different men responsible for them.

124. *To Senator Plain.*—It is essential to have a thoroughly good building in which there will be no depreciation of the stores. Any building that will dry will do for browning. In an up-to-date general store, the floor should be off the ground, so that lorries can be backed to the doors, and the floor should be all on one level so that trucks can be easily run about.

125. *To Mr. Atkinson.*—I think that for an Ordnance store a galvanized iron building, lined, would be a store a sufficient protection against the browning fumes. If sufficient protection against the browning fumes, at the end of the order there were a browning room at the end of the Ordnance store it would certainly be easy to carry off the fumes. I think that it would be quite enough if a

portion of the ordnance store, roughly, 6,000 square feet, was separated by a fireproof dividing wall.

120. *To Senator Foll.*—The browning process is applied whenever it is necessary. It has not been necessary during the last ten years, because the rifles have been so quickly superseded, but provision must be made for it. We should be doing some browning now, and if the rifles go out to the Citizen Forces they will require browning in two years' time; it all depends on the life of the rifle, and the new Mark 111* should stand four or five years. A rifle that has been overseas and rubbed about will have to be browned in the next two years. Rifles when sent in for repairs and browning should be re-browned straightaway if the men and plant are available. If we got rifles in now for re-browning, we should have to shift our machine guns which are now in the browning room.

121. *To Mr. Mathews.*—All the different States were equipped with the Mark 111, and, therefore, any browning necessary in Western Australia will be necessary in Victoria. During my fifteen years in the armoury, there have not been 100 barrels browned. Browning is really scientific form of rusting in order to prevent further rusting. Gun-metal watches are treated in this way, and we have seen how they turn white. It is my idea to have the browning and drying rooms in one, provided, of course, that there is not too much work, and provided you have benches so that you can stack your parts. For small quantities it is really better to have both in one, because the air is warmer and moister. If, at the northern end of this store and forge, a browning and drying room is separated from the rest of the building with doors of communication, an iron and brick-lined building would do for the rest of the stores and rifles, provided there be a pitched roof high enough to give proper ventilation. I think that would be suitable in hot weather in Victoria. Unserviceable goods which we may require to sell have a special store in the ordnance store, but not in the armoury. When a thing is condemned as unserviceable, it is certified as such by the senior ordnance officer, or one of the supervisors. On frosty mornings there is always a drip in wood-lined iron buildings, but, as in Victoria, that trouble could be prevented by ceilings.

The witness withdrew.

Lieutenant-Colonel Archie John Landles Wilson, Director of Equipment and Ordnance Stores, Department of Defence, recalled and further examined.

128. *To Senator Newland.*—It has been decided by the Quartermaster-General that, so far as the Midland Junction Stores are concerned, the armoury workshop should be portion of a general workshop, and not in the main ordnance stores. I do not consider it advisable that the armoury should be accommodated in the ordnance stores. It is, in my opinion, a sounder proposition that all the trades should be accommodated under the one roof. In my previous evidence I expressed the opinion that the site proposed for the workshop is not a suitable one, and recommended that it should be erected towards the southern end of the land, or upon an additional area. I understand that the land across the railway line, to the west, is not available, and I would strongly recommend the acquisition of the land, comprising about 6 acres, to the north of the site. I think that would be a very good site for the erection of the workshop. There is a cottage erected on that land, and I recommend that the cottage and the entire block should be acquired. That would be quite close to the ordnance store, and the rifles could be housed

in the northern end of the store. The rifles and machine guns would be stored in the main store, but the armourers' workshop would be in another building, the forming part of the general workshop. Portion of the arms could be accommodated in the mobilization store, but rifles would not be stored in the armourers' workshop. When I am informed that the armourers' work of opinion that rifles should be stored in the same building as the armourers' workshop, I have to say that I do not agree with that view at all. A working saddler might, with equal reason, claim that all harness equipment should be stored in the saddlers' shop, or a sail-maker might, with equal reason, claim that all canvas, tents, and so on, should be stored in his shop. In my opinion, from 1,200 to 1,500 square feet of space is ample room for an armoury in Western Australia. An area of 6,000 square feet is altogether unnecessary for the purpose. With regard to fire risk and the suggestion that the armourers' workshop might be established in a portion of the ordnance store building if it were partitioned off from the rest of the building, I should like to say that the degree of risk depends upon the operations to be performed by the armoury section. In my opinion, it is not economical that the armourers should do any work other than the overhauling, repairing, cleaning, and browning of arms. Under these conditions, no plant which would cause risk of fire would be installed in the armoury, except that which would be necessary for browning. I am of opinion that the browning plant should be in a separate building. There would be no great risk of fire if the browning plant were properly cut off from the rest of the building. In my opinion, a forge is not necessary in the armourers' store. If one were put in, it would be idle for 90 per cent. of the time. The proper place for the forge is in the general workshop, where it would be available for general use. There would be no objection to the browning being done in the main building so long as suitable partitions were put up to separate the browning room from the rest of the building. The effect of fumes or acids from the browning room would be to rust metals, and all metals would be affected in that way by those fumes or acids. Under ordinary conditions, very little browning would be done in the armourers' store. For perhaps the next twelve months, while rifles, and particularly pistols, are coming out from Home, we shall have a fair amount of browning to do. Once that is done, there will be very little browning work to be done in the armourers' shop. There is not much browning work done in the ordnance stores at Melbourne, and there will be less of that work to be done in Western Australia. When I am asked whether I consider it economical to put up a special building for browning when there is so little of the work to be done, I must say that the question is a somewhat difficult one to answer without being in possession of actual statistics of the volume of work to be done. In my opinion, however, the erection of a separate building for browning could stand over until the matter of the provision of general workshops is decided. It is not urgent to decide upon having a separate building for browning. The main ordnance store, as distinguished from the mobilization stores, should be lined particularly on the northern and western sides. I previously expressed the view that the main ordnance stores should be lined, particularly on the northern and western sides, having in mind the climate of Western Australia—that it is hotter there than in Melbourne—and also the fact that there would be a number of men working there. I consider that an unlined galvanized-iron building would be hot, and the conditions would not be as congenial as they might be to those called upon to work in it, or satisfactory for the preservation

of equipment, portion of which would be exposed in the ordnance stores. Material accommodated in the mobilization stores would practically all be cased. I understand that the roof of the ordnance stores is to be lined, and that would prevent the dripping of moisture from the roof. Buildings used as ordnance stores in England with galvanized-iron roofs have the roofs coated on the inside with a preparation of cork to prevent the dripping of moisture. I have seen the plan of the roof of the ammunition store, and have noted the fact that it extends over the railway platform, and would cover the funnel of a locomotive alongside the platform. I consider that the risk of fire from sparks from locomotives should be avoided. As a general rule, ammunition stores are established on a loop, and trucks are kicked into the store, or alongside it. In my opinion, it would be advisable to place the ammunition store a little further back from the line than is proposed, so that the roof might be clear of the engine. It would be necessary to build the protecting platform up to the railway line for the whole length of the building.

129. *To Mr. Moloney.*—If workshops were being erected for the convenience of the ordnance stores, I would consider that the armourers should be accommodated in a building separate from the ordnance stores, and form a part of the general workshop. I do not see any more necessity for the erection of a brick building for the armoury than for any other section of the ordnance. The plan submitted to me as the suggestion of the chief armourer is apparently based on the assumption that all stores coming in, in the way of machine guns, rifles, pistols, or small arm packages are to be in charge of the senior armourer. That is not the policy of the Defence Department. It is not the intention to place responsibility for stores upon any of the tradesmen. The stores will be in charge of the storeroom in the different sections. At the present moment I would not recommend the erection of a special building of brick or any other construction for a browning plant. I consider that the browning room should be part of the general workshop. A plan is at present being prepared for the proposed workshop for this site, and in that plan provision will be made for an armoury workshop and also a browning room.

130. *To Mr. Mackay.*—As to whether rifles and machine guns transported by rail should go to the ordnance stores or to the workshops, everything depends upon where they would come from. If the delivery was of new rifles from the small arms factory the goods would go direct to the ordnance stores. If the delivery were of rifles coming in purely for repair they would be taken straight to the armoury. If, for instance, an order were issued calling in all rifles from the militia they would go to the ordnance stores where they would be outwardly inspected, and any considered to be in need of repair would be sent to the workshop for attention. Under ordinary conditions the transport of rifles from the ordnance store to the workshop would be so very small in volume that a hand truck would be all that would be necessary, and it would be unnecessary to have a tramway between the ordnance store and the workshops. Any evidence given on this point by armourers would possibly be to the effect that there would be a considerable amount of handling of rifles, because it has been the practice in the past for armourers to control the stock of rifles, but that practice has recently been changed, and you will understand that if the care of the bulk stock of rifles, machine guns, and spare parts is taken away from the armourers the traffic between the ordnance stores and the armoury will be represented practically by the small number of rifles coming in, for

repairs. Under the practice now adopted the armoury staff are not held responsible for the stock; they are considered only as tradesmen.

131. *To Senator Foll.*—The armourers have now no control over the stock of rifles. Once rifles are properly put down in their cases and treated, there is little need for further attention to them beyond a periodical inspection when a chest here and there is opened up, and a quantity examined, from 10 per cent. upwards according to place of storage, to see that the rifles it contains are all right. Once rifles leave the armourers' shop there is nothing in connection with them for the armourers' staff to do except that they may always be called upon if necessary to inspect rifles which have been opened up. If a storeman has any doubt as to the condition of rifles, he can call in an armourer to look at them. This duty of inspection is ordinarily controlled by an inspector of small arms. It is not necessary for this reason that the rifles should be kept under the control of the armourers.

132. *To Mr. Mathews.*—There is much less browning done in Western Australia than is done here. We can go on without a browning room in Western Australia at present. We cannot definitely decide on the amount of browning it will be necessary to do until the rifles have been actually received from overseas and have been inspected. Under normal conditions the amount of browning required to be done in Western Australia will be very small indeed. It is my idea that browning and drying can be provided for as part of the equipment of a general workshop, and any small arms requiring attention can be looked after in those workshops. They can be removed from the ordnance stores to the workshop for the purpose, and when attended to taken back to the ordnance stores again. I consider that for the work to be done at Midland Junction 1,500 square feet of floor space would be ample for such a workshop. I think that browning and drying could be done in one room. I would not provide a forge in that room. When work required to be done it could be taken to the general forge of the workshop. I regard the armoury as chiefly for assembling and cleaning. For assembling and cleaning a forge is not necessary. We can very well wait until we know what browning will have to be done before we decide about erecting a special building for that work. The examination and inspection of rifles will be done by armourers. A rifle may come in from a rifle club that clearly requires rebarrelling, and there is no reason why it should first go to the ordnance stores. It can be sent direct to the armourers' shop for repairs. From the armourers' shop after it was repaired it would, of course, be returned through the ordnance stores.

133. *To the Chairman.*—The intention of the Department in submitting plans for this work was to enclose a small portion of the main ordnance store for an armoury until the workshop was put up. That is what we propose now to do. The armoury is to be established at Midland Junction, and all the workmen to be employed will go there. It is not the policy of the Department to have officers connected with these stores in Perth as well as at Midland Junction. The whole clerical staff will be brought out to Midland Junction, and all the work conducted in the one establishment. In the ordnance stores most of the goods will be in packages. Seeing that the ordnance stores and mobilization stores in Western Australia will be on one site, probably all the rubber goods will be put into one building. After careful consideration and consultation with the Quartermaster-General and the Director of Works, I am of opinion that all four walls of the ordnance store building should be lined,

and that 400 square feet of floor space in the south-eastern corner of the ordnance store should be partitioned off for the better protection of waterproof sheets and other rubber goods. In the plans drawn up for workshops provision is made for an oil and paint store. It is recommended that the oil and paint store should be erected on the block of ground to the north, which we recommend should be acquired. A small store will be needed for petrol, and provision will be made for that also. It will be necessary to have what we call an "in-serviceable" store. A building of the cheapest possible construction will be sufficient for the purpose. So far as I am aware no estimates have been prepared for the oil and paint and the petrol stores. I recommended in my previous evidence that provision should be made for both lunching and changing rooms.

134. *To Mr. Mackay.* With respect to the rifles we get from overseas, we cannot actually tell yet whether they will be rifles used by the Australian Imperial Force. The undertaking by the War Office is to issue us with new, or serviceable, equipment. In some lines we find that the equipment is new, and in others it is what is called serviceable equipment. It has been through a workshop and repaired, but judging from the arms that have come to this State the rifles and pistols have not been reworked.

135. *To the Chairman.*—We recommend the acquisition of the entire area to the north of the Midland Junction site and the cottage erected thereon. The Works Director informs me that the total cost of the area of about 6 acres and including the cottages will be about £1,200. The Quartermaster-General very strongly recommends that this property should be acquired.

136. *To Mr. Mathews.* The idea is that for the present the armory will be accommodated in the new building without drying or brownning rooms pending the erection of the general workshop.

The witness withdrew.

John Smith Murdoch, Chief Architect, Department of Works and Railways, recalled, and further examined.

137. *To the Chairman.*—I am aware that some question as to the risk from fire is raised by the fact that provision is made for the roof of the ammunition stores extending for 9 ft. 3 in. from the wall of the building over the railway platform of 3 ft. 3 in., thus bringing the roof of the building over the funnel of an engine alongside. I think that it is important that the building should be further away from trains. Since I was last before the Committee I have given some consideration to this matter, which I regard as very important indeed. A few ideas have occurred to me to overcome the difficulty. I do not think that it would be desirable to shorten the roof projection, which I think is really needed to keep the walls of the building cool, which is a consideration to which attention must be given in connexion with this store. I think that as a way out of the difficulty the platform could be made at least as wide as the roof projection. In that way the funnel of an engine would be removed from the roof. I also think that a very good thing to do would be to lower the floor of the building altogether. Incidentally the floor of the platform would be lowered. This would mean that the deck of the small trolley, which will be used to convey boxes of ammunition from the railway van into the building, would be level with the floor of the van. The effect of that would be that loading from a van into a trolley would be on the level, and the trolley would be taken into the building in the way now proposed. If the floor level of the building

were made 18 inches high that would mean a reduction of 18 inches in the height all over of the building as at present proposed. It would mean a considerable saving in the cost of the building, whilst it would add to the provision for safety from the risk of fire from sparks from an engine. Broadly, what I suggest is that the platform instead of being 3 ft. 3 in. wide should be made at least 9 feet wide, and that the building all over should be reduced in height by 18 inches. If this were done the funnel of an engine alongside the platform would be higher than the eaves of the roof projection, whilst it would be further removed from the building. The floor level of the building instead of being 3 ft. 6 in. high as now proposed could be made 9 ft. high, and thus reduce the height of the building all over by 18 inches. If the floor of the building were made lower as I propose, it would be slightly below the level of the floor of motor lorries into which it would be necessary to load ammunition, but I do not think that that would present any very great difficulty as the boxes of ammunition could readily be moved up an inclined plank to the floor of a van or lorry.

138. *To Mr. Mathews.*—There will be a platform 6 feet wide on the road side of the store, the middle platform in the centre of the building is to be 27 feet long, and will cover the two centre doors. There are isolated platforms 12 feet long covering the two end doors.

139. *To the Chairman.*—The platform could be raised, but I think that for loading of the average type of cart the lower level I propose would be better. If the level of the floor of the trolleys is 3 ft. 6 in. or the height of the floor of railway van above the ground that would be only slightly higher than the level of the floor of the average cart. The suggestions I have made would considerably overcome the objection urged against the present plan, and incidentally would in my opinion provide a more convenient and cheaper building. We should save 18 inches in the height of a brick wall and 18 inches filling. I do not wish to dwell upon the aesthetics of the matter, but I think that the alterations I have suggested would make a better looking building. If these expedients to overcome the difficulty suggested were adopted we should have a cheaper and more convenient building. The railway platform might be made wider than the roof projection. It might be made 10 feet wide, but in that event some of the platform would be exposed overhead. I do not think that is a matter of any importance. I have ascertained that munitions are packed in cases, and it would not be possible for the contents to suffer much from wet in the transport across the small portion of the platform between the railway van and the protection afforded by the roof projection. If it were thought possible that damage might result in that way it could be prevented by putting tarpaulins over the boxes of munitions when they were being taken from the van to the munition stores. I do not see why we should not have a timber platform instead of a brick platform. It would be cheaper, and as the timber platform would be on brick piers it would be quite safe from destruction by white ants. Our instructions at the beginning were that there should be no uncovered space between the railway truck and the building, but I do not think that is very material. I have no wish to pose as an expert upon a matter that may be regarded as a technical military question, but we know that all goods in handling are exposed more or less to the open air, and with a little care it should be possible to prevent any damage to these goods. I think that the idea was to adopt the English standard in connexion with the munition stores. The climate in England is worse

than the climate here, and I believe that the Defence authorities were concerned about securing absolute protection from the weather. I think, however, that we might make provision for a little open space on the platform without any damage to the stores. When I am informed that it is estimated that to acquire the land to the north of the present site with the cottage erected thereon would cost £1,200, I have to say that I consider the estimate high. I was told in Western Australia that the land was probably worth £70 per acre. If we paid £80 per acre for it that would represent £480. If we say that the improvements on the land are worth £500, the total valuation would be £980 or, roughly, £1,000. If the property could be secured for £1,000, or even a little more, it would be good business. If this property were acquired we should be provided with an area of land on which there is at present erected a cottage which I consider quite suitable for the caretaker of a place of this kind. You are aware that the cost of a new building at the present time is very heavy. I had a good look at the cottage on this land. It is in a good state of preservation, and quite suitable for a caretaker. I think that it is a bigger cottage than we have put up at Liverpool, and it would cost about £800 to build it to-day.

140. *To Mr. Mackay.*—A nominal expenditure of £30 or £40 would put the cottage on the land at present into a condition in which it would last for years. The difficulty in connexion with caretakers' cottages is, of course, that those who have to reside in them have rather extravagant ideas of the accommodation which should be provided for them, and look for more than they would expect in private life. It would be more convenient if there were not a road between the cottage and the stores, but this is rather an out-of-the-way place; there is not much traffic on the road, and the severance of this property from the site of the stores is not a serious disadvantage. In Perth Mr. Parker Moloney suggested that I should look into the disparity between the estimated cost of the vehicle

store at Midland Junction and that of a similar store at Seymour. There is a difference of about £100 between the two estimates, the estimate for the building at Midland Junction being £900 higher than the estimate for the building at Seymour. I have looked into it and I find that the important item of difference in cost is the price of the brick flooring. The Department of Works in Perth has never had experience of brick flooring, and I found that in their estimate they quoted the extreme price of 15s. 2d. per square yard. I have done brick paving in the vicinity of Melbourne and in Sydney also, when prices were much lower than they are to-day, for from 4s. 6d. to 4s. 9d. per square yard. Allowing for the increase in prices the estimate for this work at Seymour was 6s. 6d. per square yard. I may say that since that estimate for Seymour was made I am of opinion that we shall find that the cost will run up to from 7s. 6d. to 8s., and perhaps 8s. 6d. per square yard, as the cost of cement and other material is now abnormal. There would still be a tremendous difference between 8s. 6d. per square yard and the Western Australian price of 15s. 2d. I think that we should find no difficulty whatever in getting the work done at Midland Junction, even in view of the increased price of bricks and cement, for 10s. per square yard. That would represent a difference of 5s. per square yard for about 3,000 square yards, which would account for a reduction in the estimate of £750, and go far on that item alone to make up the difference of £900 between the estimate for the vehicle stores at Midland Junction and that for the store at Seymour. I saw the quantity surveyor who made out the estimate for the vehicle store at Midland Junction. He went into the matter with me, and agreed that, assuming that my representations were correct, his price of 15s. 2d. might be brought down to about 9s. 6d. per square yard. Even if we allowed for 10s. per square yard that would mean a reduction in the present estimated price of £750. If the work could be done for 6s. 6d. per square yard, the original estimate for similar work at Seymour, the reduction would of course be considerably greater.