

1930.



THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA.

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PARLIAMENTARY STANDING COMMITTEE
ON PUBLIC WORKS.

Clerk of the Senate.
16 JUN 1930

REPORT

TOGETHER WITH

MINUTES OF EVIDENCE

RELATING TO THE PROPOSED ESTABLISHMENT OF AN

AUTOMATIC TELEPHONE EXCHANGE

AT

HAWTHORN, VICTORIA.

By Authority:

H. J. GREEN, GOVERNMENT PRINTER, CANBERRA.

MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

(Seventh Committee.)

ANDREW WILLIAM LACEY, Esq., M.P., CHAIRMAN.

<p><i>Senate.</i> Senator John Braidwood Dooly Senator Matthew Reid Senator Burford Sampson.</p>	<p><i>House of Representatives.</i> Malcolm Duncan Cameron, Esq., M.P. John Curtin, Esq., M.P. Hon. Henry Gregory, M.P. Edward James Holloway, Esq., M.P. William John Loeb, Esq., M.P.</p>
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EXTRACT FROM THE VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES, No. 13,
 DATED 11th DECEMBER, 1929.

6. PUBLIC WORKS COMMITTEE—REFERENCE OF WORK—HAWTHORN, VICTORIA—AUTOMATIC TELEPHONE EXCHANGE.—
 Mr. Lyons (Minister for Works and Railways) moved, pursuant to notice, That, in accordance with the provisions of the *Commonwealth Public Works Committee Act 1913-1921*, the following proposed work be referred to the Parliamentary Standing Committee on Public Works for investigation and report:—Hawthorn, Victoria—Establishment of Automatic Telephone Exchange.
 Mr. Lyons having laid on the Table plans, &c., in connexion with the proposed work—
 Debate ensued.
 Question—put and passed.

LIST OF WITNESSES.

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AUTOMATIC TELEPHONE EXCHANGE, HAWTHORN, VICTORIA.

REPORT.

The Parliamentary Standing Committee on Public Works, to which the House of Representatives referred for investigation and report the question of the establishment of an automatic telephone exchange at Hawthorn, Victoria, has the honour to report as follows:—

INTRODUCTORY.

1. The existing Hawthorn Telephone Exchange, located at the corner of Burwood-road and Kent-street, was opened for service in 1891. It has a common battery manual equipment, and, during the year ended 30th June, 1929, catered for an average number of 5,303 subscribers.
2. It is represented that at the average rate of normal expansion, the existing equipment will reach the limit of its capacity during 1932, and further extension to provide for development will not be possible in the present building.

PRESENT PROPOSAL.

3. The proposal now submitted is to erect on a site which has been acquired in Burwood-road, almost opposite the Post Office, a modern exchange building, and install therein an automatic telephone switching system having an initial equipment for 6,900 subscribers' lines and an ultimate capacity of approximately 11,000 subscribers' lines. It is proposed that the initial equipment shall be capable of extension to the ultimate capacity named, and thus enable requirements to be met in the proposed automatic exchange area for a period of approximately twenty years from the proposed date of opening.

ESTIMATED COST.

4. The estimated immediate cost of the work is set down at:—

	£
Site (already acquired)	3,200
Building	15,750
Air-conditioning plant, &c.	2,020
Exchange equipment, including that necessary at other exchanges	122,590
Sub-station equipment	22,190
Line plant (diversion)	4,670
Sundries	2,370
	172,790

and it is estimated that the new exchange will be opened for traffic by about April, 1932.

COMMITTEE'S INVESTIGATIONS.

5. The Committee visited the existing exchange, inspected the site for the proposed new building, and traversed portion of the area which would be served by the new automatic exchange. A careful scrutiny was made of the plans submitted, and evidence obtained from the Chief Engineer, Postmaster-General's Department, and the Principal Designing Architect, Department of Works.

AREA TO BE SERVED.

6. It was ascertained in evidence that the area which would be served by the new exchange is bounded on the east by Burke-road, on the north and west by the River Yarra, and on the south by Gardiner's Creek, and contained at the end of 1929 a population of 50,630.

SITE.

7. The site, which was acquired by the Commonwealth for the sum of £3,200, is situated on the north side of Burwood-road, Hawthorn, at a distance of 238 ft. 7 in. from the north-east corner of Glenferrie-road and Burwood-road. It has a frontage of 71 ft. 11 in. to Burwood-road, by a depth of 215 ft. 1½ in.; with a fall of 5 feet from north to south and a cross fall of 3 feet.

8. Situated in the middle of the allotment is a large old-fashioned brick villa, probably 60 or 70 years old, in front of which is an old over-grown garden containing a number of elms and Moreton Bay fig trees. A report obtained by the Committee indicated that the building is of little value, and to clear the site ready for the proposed exchange would cost, approximately, £100.

9. The ideal location for an automatic telephone exchange, other things being equal, is at what is called the "theoretical copper-centre"—that is; the point at which the least amount of telephone cable will be required to be laid to give service to all the subscribers in the area. It is not necessary that an automatic telephone exchange should be in a position easily accessible to the public, consequently the Committee has hitherto favored the location of such exchanges on inexpensive land away from the main streets. In this instance, however, owing to the density of population in the locality, the available sites were few, and the Committee ascertained that the cheapness of any more remote site of a suitable size was off-set by the greater expense that would have to be incurred in laying the telephone cables to it.

10. After giving the matter careful consideration, and having in view the fact that the site in Burwood-road is conveniently situated as regards the theoretical copper centre and is excellent building land, the Committee agreed to recommend that it be adopted for the telephone exchange.

BUILDING.

11. The building proposed will cover an area of 54 ft. 8 in. by 102 ft. 8 in., and is to be of simple construction, with foundations of reinforced concrete, walls of brick, columns and beams of steel, and floors and staircase of reinforced concrete. The roof principals will be of steel with the ceilings of fibrous cement sheets fixed to wooden bearers. Direct lighting is to be obtained from the corrugated glass in the roof and through sashes in the ceiling. The soffit of eaves will be sheathed in iron or fibrolite. Owing to the prominent position of the building, it is proposed to use terra-cotta tiles on the roof. The whole of the building is to have steel-framed windows, glazed with wired rolled plate glass. The elevations are designed in brick, with cement finishings, and, generally speaking, the building will be of plain design, and fire-resisting.

12. The ground floor will contain a staff-room, 27 feet by 19 ft. 6 in.; power-room, 28 feet by 19 ft. 6 in.; battery-room, 28 feet by 19 ft. 6 in.; air-conditioning room, 28 feet by 19 ft. 6 in.; store 15 feet by 11 ft. 6 in.; and trunk-room, 87 feet by 24 feet.

On the first floor the switch-room will be 100 feet by 52 feet, less the staircase.

The ground floor will have a height of 14 ft. 6 in. from floor to ceiling, and the switch-room on the first floor 12 feet.

It is estimated that the building can be erected in seven or eight months from date of commencement.

MECHANICAL SERVICES.

13. The mechanical services proposed to be installed are as follows:—

	Estimated Cost.
	£
Heating and ventilating plant, with oil type filters for the elimination of dust	1,600
Vacuum cleaning plant	420
Total	2,020

The proposed heating and ventilating plant is similar to that recently approved for other exchanges in Victoria, and is represented by the telephone engineers to be all that is necessary to ensure the efficient working of the equipment under the climatic conditions to be expected at Hawthorn. Space has, however, been provided in the machine-room for the future installation of a full air-conditioning and de-humidifying plant if experience should show that such is necessary.

14. The estimate of the building includes all ordinary electric lighting and power wiring, sewerage and water services. All these services present no difficulties—the necessary main sewers, electric light and water mains being in the adjacent streets. Fire appliances will be installed in accordance with the regulations governing these services as laid down by the Commonwealth Fire Board for all exchanges.

PRICE OF EQUIPMENT.

15. In investigating the various proposals for the establishment of automatic telephone exchanges submitted to it, the Committee has noted that although the prices of metals and materials generally have fallen in recent years, there seems to be no marked reduction in the cost of the equipment installed in these exchanges. This is, of course, a technical matter on the details of which the Committee refrains from expressing a definite opinion, but it is recommended that the close attention of the officials concerned be given to it so that the Government may be assured that all telephone equipment is being obtained at the most reasonable rate possible.

FINANCIAL ASPECT.

16. It was stated in evidence that the total annual charges for the proposed automatic telephone system as at the proposed date of cut-over, namely April, 1932—including interest at 5 per cent. and depreciation at 4 per cent.—are estimated at £55,240 and five years later at 65,810
The actual revenue for the year ended 30th June, 1929, was 58,740
the estimated revenue as at April, 1932, is 69,790
and the estimated revenue five years later 86,400
The assets thrown spare if the automatic system is installed in April, 1932, are estimated to have a recoverable value of 21,200

An amount of £46,310 will have to be written off in the departmental accounts as representing the proportion of the capital outlay on the original assets which is irrecoverable, and includes depreciation due to wear and tear, and labour in installation.

RATE OF INTEREST.

17. In connexion with the financial aspect, the Committee notes that the rate of interest charged is reckoned at 5 per cent. In the opinion of the Committee this is somewhat misleading as it is obvious that at the present time money cannot be obtained at that rate. It is realized that the capital expended on certain plant *in situ* which was purchased some years ago was obtained at a low rate of interest, but to make the financial position quite clear it is recommended that, in future, the interest charged on all new expenditure should be set out at the actual rate paid.

COMMITTEE'S RECOMMENDATION.

18. After considering all the aspects of the question, the Committee recommends that the proposed installation, as suggested by the Department, be put in hand as early as practicable.

A. W. LACEY,
Chairman.

A. W. Lacey

Office of the Parliamentary Standing Committee on Public Works,
Parliament House, Canberra, 23rd May, 1930.

MINUTES OF EVIDENCE.

(Taken at Canberra.)

WEDNESDAY, 14th MAY, 1930.

Present:

Mr. Lacey, Chairman;
 Senator Dooley Mr. Curtin
 Senator Reid Mr. Gregory
 Senator Sampson Mr. Holloway
 Mr. M. Cameron Mr. Long.

John Murray Crawford, Chief Engineer, Postmaster-General's Department, sworn and examined.

1. To the Chairman.—I am responsible for the proposal to establish an automatic telephone exchange at Hawthorn, Victoria. The project is to erect a building on a site, which is Commonwealth property, situated in Burwood-road, near Glenferrie-road, and install thereon an automatic telephone switching system having an initial equipment for 6,000 subscribers' lines, and an ultimate capacity of approximately 11,000 lines. It is proposed that the initial equipment shall be capable of extension to the ultimate capacity named, and thus enable requirements to be met in the proposed automatic exchange area for approximately twenty years after the proposed date of opening. The population of the area proposed to be included in the new automatic exchange was estimated in December, 1929, to be 60,030. The existing common battery manual equipment will reach the limit of its capacity during 1932, and further extensions to provide for development will not be possible in the existing building which was opened for service in 1891, and, therefore, has been in use for 39 years. It is proposed to install a complete modern plant in a new building on the new site, in order to give efficient service to the existing and prospective subscribers in the area. The estimated immediate cost of the work is:—

	£
Site (already acquired)	3,200
Building	15,740
Air conditioning plant, &c.	2,620
Exchange equipment, including that necessary at other exchanges	122,600
Substation equipment	4,470
Lines plant (diversion)	2,370
Sundries	172,790

The actual revenue for the year ended 30th June, 1929, and the annual revenue estimated to be obtained on the date of opening and five years thereafter are shown hereunder:—

	Number of Lines.	Rents.	Calls.	Miscellaneous Charges.	Trunk Line Calls.	Total.
As at cut-over ..	6,300	£ 33,642	£ 31,193	£ 772	£ 4,173	£ 69,782
Five years later ..	7,800	£ 41,028	£ 38,022	£ 958	£ 5,167	£ 85,307

The proposed site is situated in Burwood-road, near Glenferrie-road, Hawthorn, and is Commonwealth property. It has a frontage of approximately 72 feet to Burwood-road, and a depth of approximately 215 feet, and is located as near as practicable to the telephonic centre of the proposed automatic exchange area, adjacent to the existing manual exchange site. It is proposed that the building shall be of simple design,

and designed on the latest fire-resisting principles. The immediate installation in the exchange is for an equipment of 6,000 subscribers' lines, but the building will be designed to accommodate equipment having a capacity of approximately 11,000 subscribers' lines. The financial aspect of the project is shown by the following table:—

Item.	As at April, 1932.	As at April, 1937.
1. Capital cost—new	172,790	189,630
2. Capital cost—new and in situ	486,570	582,890
3. Annual working expenses of proposed automatic exchange, including interest and depreciation	14,230	17,120
4. Total annual charges for proposed automatic exchange, including interest and depreciation	53,240	65,810
5. Annual Revenue—actual for the year ended 30th June, 1929—£58,740. Estimated as at April, 1932	60,700	..
6. Assets recoverable or thrown spare if an automatic exchange be established at April, 1932— (i) Book value	67,510	..
(ii) Recoverable value	21,200	..
(iii) Cost of recovery	2,240	..

Regarding item 6 of the foregoing statement, the difference between sub-items (i) and (ii), namely, £46,310, is an amount which will have to be written off in the departmental accounts as representing the proportion of the capital outlay on the original assets, which is irrecoverable, and includes depreciation due to wear and tear and labour in installation. I submit the following certificate by the acting accountant regarding the actual revenue of the existing exchange and the estimated revenue of the proposed automatic exchange:—

(a) Actual total revenue received from the subscribers and public telephones in the existing Hawthorn Telephone Exchange area for the twelve months ended 30th June, 1929:

	£	s.	d.
Rents	28,318	1	4
Calls	26,238	2	3
Miscellaneous charges	500	4	8
Trunk line calls	3,512	10	4
	58,739	7	7

Average number of lines connected during the above-mentioned twelve months, 5,303.
 Average revenue per line, £11 1s. 6d.

Estimated annual revenue for the proposed Hawthorn Automatic Telephone Exchange area as at the proposed date of cut-over, i.e., April, 1932, and five years later:—

	Average number of subscribers lines connected during the year ended 30th June, 1929.	Actual total annual revenue received for the year ended 30th June, 1929.	Estimated number of subscribers received for 1932 (date of opening).	Estimated annual revenue, April, 1932.	Estimated number of subscribers (five year date).	Estimated annual revenue, April, 1937.
	6,303	£58,740	6,300	£60,700	7,800	£86,400

I hereby certify that the above figures have been computed from the books and records of this office, and the figures with respect to the revenue are, to the best of my knowledge and belief, correct.

R. McDONALD,
 Acting Accountant, Postmaster-General's Department.
 Melbourne, 12th November, 1929.

The area to be served is bounded on the east by Burwood-road, on the north and west by the Yarra River, and on the south by Gardiner's Creek, but eventually portion of the north-eastern corner will form part of a new exchange to be established at East Kew not earlier than five years after the date of the cut-over of the Hawthorn manual exchange to automatic. At present the residents of Hawthorn are served by a common battery manual exchange, but as it has been in operation for 39 years, a large proportion of its equipment is practically worn out. Hawthorn is a fairly populous and well settled suburb, but to the north-east and south-east of the exchange area there is still a fair extent of vacant land. The number of subscribers in the Melbourne metropolitan area has increased at an average rate of 6.5 per cent. per annum, and the Hawthorn exchange will probably grow more rapidly than inner suburban areas like Brunswick, Richmond and Collingwood. Hawthorn is one of those suburbs which may be expected to develop steadily over a considerable period. The present manual exchange has efficiently handled the traffic for many years but is no longer capable of extension. The multiple switchboard has reached the limit of its growth, and we would not be able to extend it. We shall be able to use a certain portion of the equipment, and that has been taken into account in the statement of recoverable assets. The opportunities for using common battery apparatus are remote because the cost of working manual exchanges is greater than the cost of installing automatic equipment. The equipment has already been written down by depreciation and after it has been recovered, comparatively little will be utilisable again. No matter how much attention is paid to maintenance we cannot prevent wear of the jacks and plugs. The multiple could be renewed, but the cost would be so great that it is more economical to provide new automatic equipment. Hawthorn will be one of the postal centres of the future and presumably considerably more building space will be required for postal work than at present. In that way I anticipate that the present exchange building will be utilised, but if it is not required for that purpose soon, the best use to which it can be applied would be to house the foreman mechanic. Whether the building will be available for that purpose I cannot say, but I have no doubt that it could be put to that use. In front of the existing building is a vacant room of fair size which previously was used by the mechanics, but it would not be practicable to extend the building for the purposes of an automatic exchange. The site for the new building was acquired by the Survey Branch of the Works Department acting in conjunction with the Superintending Engineer at Melbourne. The Works Department never purchases land without knowing the use for which it will be required, and it also prepares the plans and estimates the cost of building. I assume that the estimated cost of the building includes the removal of the residences and trees that now occupy the site. The area required is probably the most suitable obtainable. An automatic exchange can always be established in a side street, but it is not economical to do that if it involves a lengthening of the cables. The existing ducts and cables are laid along Burwood-road. If an exchange building were erected 200 yards down a side street, the cost of extending the cables would be greater than the economy effected by buying a cheaper block. It is better to pay more for a block on the main-line of ducts than to incur the expenditure of extending the cables. Presumably, the survey officers consider that the price paid for the land was reasonable. The way-out of the block shows the building so placed that there will be a clear space of 8 feet on one side and 11 feet on the other side. That arrangement will give excellent light all round the building and as the

switch room, which is 52 x 100 feet, is to meet development for the next 20 years, this is a considerable advantage. We may not need the whole depth of the block, but the space at the rear will be of advantage because it will enable us to house our own equipment. I do not say that it is absolutely necessary to have this space, but this proposal is to cater for development in the next twenty years, at the end of which we shall be able to build on to the rear of the proposed building more cheaply than by adding another storey to it. Very little vacant land is available at the back of the present exchange building. Portion of the area is occupied by a brick hall and a weatherboard hall, both of which are used by the Hawthorn City Council, and a small building which is utilized by the Postal Department. We investigated carefully the possibility of extending the existing buildings, but we decided that it would be more economical to purchase another site and erect a new building. If the building at the rear of the existing exchange were removed, the linemen, who are now accommodated there, would have to be provided for elsewhere. The site of the existing exchange building is quite suitable for an automatic exchange, the only objection to it is on account of cost. We are proposing to install a modified air conditioning plant, of the Mid-West oil filter type, similar to that which has been adopted for the new Brunswick automatic exchange. Statistics for the last 20 years show that the highest mean humidity for any month was 59 per cent. and that was in June. As the temperature is low at that period of the year, a high degree of humidity is not so dangerous as in Sydney where often in February and March the humidity is between 80 and 90 per cent. The establishment of an automatic telephone exchange at Hawthorn is urgent because the existing switchboard has nearly reached the limit of its capacity and within a short period we shall not be able to give further service in that area.

2. To Senator Reid.—About three weeks ago we had in hand 35 applications for connexion with the present manual exchange; 28 of those were in course of installation. The other seven were delayed for reasons over which the Department had no control. By 1932 the existing exchange should reach the limit of its capacity. We estimate that the subscribers will increase at the rate of between 6 and 9 per cent. per annum. That is based on the average for similar districts throughout the metropolitan area. There are indications that, owing to the financial depression, the rate of development may drop in the next 18 months or two years, but I regard that as only a passing phase. Throughout the area are many vacant building plots, and I anticipate a steady development. On both sides of the site for the new exchange are residences; at the rear is the municipal yard. The residences are old and are not more than 25 feet high, but it is possible that in time some of these sites may be utilized for the erection of flats. The space on either side of the exchange building, whilst assuring good light in the switch room, will also increase the protection against fire. We are convinced that some sort of air-conditioning plant will be necessary. Apart from the dust nuisance, experience has shown that without such a plant the deterioration of the cable is much greater. The insulation resistance of the switchboard cables drops, and at Edgelyth, Ryde and other exchanges in the Sydney metropolitan area we had great difficulty in keeping the exchanges working during a bad spell of humidity. The lead-covered cable ends at the main frame; there the braided cable commenced, and at the junction the humidity trouble is first apparent. We have had to requisition radiators and install them inside the frames,

and the discomfort of the men when the outside temperature is already in the vicinity of 90 degrees can be imagined. The humidity is worse in Sydney and Brisbane. The type of air-conditioning plant we are proposing to install at Hawthorn takes a certain amount of risk in respect of humidity, but none in respect of dust. Its cost is about half the cost of the full plant to be established at North Sydney. Our own observation coupled with our knowledge of experience in other countries convince us that this type of plant will give reasonable efficiency in places where the humidity, although high, occurs in the cool season. Undoubtedly there is a demand for increased telephone services in the Hawthorn area. We do not expect to be able to pay for this work before 1932, but unless the work is approved now and the equipment ordered we shall not be able to provide additional service by the time the existing manual exchange has reached the maximum of its capacity. If the normal rate of development declines in the next few months, we might be able to carry on with the present plant until 1933 and probably for a little time thereafter by the very expensive expedient of running cables to other exchanges. It is better and cheaper to install an automatic exchange than to patch up an old manual exchange. The staff at present employed at Hawthorn consists of 16 mechanics and 16 telephonists. When we transfer to automatic the total staff will be 20, including three telephonists.

3. To Mr. M. Cameron.—Hawthorn is mainly a residential suburb occupied by middle-class people who will be likely to use the telephone. I do not anticipate that in the near future the present telephone system will be displaced by wireless telephony. I cannot conceive of any exchange which would be a big wireless unit, sending out certain definite frequencies; every body would require to tune in on them; immediately they did so they would interfere with everybody else, using the same frequencies and the confusion would be indescribable. Even though with the development of the wireless art we may be able to get more frequencies within a certain band, you must remember that we are dealing with thousands of subscribers and we would require thousands of different frequencies. If costs are reduced considerably and we can get a band of frequencies to suit our purpose we might conceivably use wireless telephony for the development of the trunk line services. We are now able to have four conversations simultaneously on a pair of trunk lines and for the last six months we have been investigating closely the maximum number of carrier systems we can get between Melbourne and Sydney in order to avoid the creation of additional lines. We cannot put additional carrier systems on the lines at present because the interference with each other would be too great, but we are inquiring into the possibilities of development in that direction and in this way are approaching the ideal of wireless telephony, i.e., we are getting more telephone channels without erecting more wires.

4. To Mr. Gregory.—It would be possible to erect on the site of the existing exchange a building capable of housing both the post office and the automatic telephone exchange, but that arrangement would not be economical. That possibility was carefully investigated. We might get the whole of the existing site for the exchange, but we would also want accommodation for the line inspector, line foreman, and line parties that are now housed there. Certainly the linemen could be accommodated elsewhere, but it would not be economical for them to travel considerable distances to and from the exchange. Taking everything into consideration, the most economical course is to erect a new building on another site. My experience is that the

reconstruction and extension of existing buildings are costly. In my opinion the elevation of the proposed building is quite suitable for a main thoroughfare like Burwood-road. In estimating the annual charges to be borne by the exchange we allow interest at 5 per cent. and depreciation at the rate of 4 per cent. That is in accordance with departmental practice. Much of the money that has been expended on postal work was obtained at 3 per cent.; we cannot get postage works carried out with cheap money from those that are the product of dear money, and we are obliged to allow a flat rate. I am aware that the Commonwealth Government has not been able to borrow under 6 per cent. in recent years. If the Department were debited 6 per cent. for the money to be invested in the proposed automatic exchange it would still be a payable proposition. The estimate of the cost of equipment, which is approximately £19 per subscriber, is based on the latest figures available in the Department when the estimate was prepared. Of the total £122,000, £30,000 will be expended on Australian material and labour; the balance will be sent abroad for equipment. Tenders will be called in Australia and abroad, and copies of the specification will be sent to the High Commissioner. Formerly, five foreign firms tendered for the supply of equipment; on the last occasion six tendered. No Australian firm produced this equipment. We aim at having all the parts interchangeable. Insofar as the parts of any manufacturer are not interchangeable with the equipment at present installed, his tender is loaded; i.e., if a manufacturer says that 80 per cent. of his equipment is interchangeable we calculate the extra cost involved in having a bigger percentage of spares and increased maintenance. If the tender is still the cheapest, notwithstanding this loading, we accept it. I expect that in sympathy with recent falls in the prices of metals and machinery we shall receive lower tenders for the equipment we require. Although telephone rates have increased slightly in the last few years, had the automatic system not been introduced, the increase would have been greater because of the increased cost of material and labour employed in connection with manual exchanges. I cannot think of any service in which the charge to the customers has been kept as low as in the telephone service. New Zealand imposes a flat rate, but Australian and New Zealand costs are not comparable. Shortly before the retirement of the former Engineer in Chief in New Zealand I entered into correspondence with him with a view to comparing the prices New Zealand and the Commonwealth were paying for automatic equipment. We found, however, so many varying factors that a reliable comparison was almost impossible. A large proportion of the cost relates to lines. We tried to confine the comparison to equipment but because New Zealand charges a flat rate, it is able to dispense with certain parts, which are essential in Australia. Moreover, the flat rate induced a higher selling rate. Generally speaking, however, our inquiry showed that the amount we are paying per line is almost the same amount as they are paying. I shall let the committee have a copy of the specifications on which tenders are called. If there should be no increase in the number of subscribers we could carry on with the present manual equipment at Hawthorn for five to seven years. Probably during the next 18 months or two years the rate of development will drop 50 per cent. If so, we shall postpone this proposal for twelve months.

5. To Senator Reid.—You must not assume that this exchange will be established with money borrowed at 6 per cent. Why should it not be built out of revenue? The revenue of the Department goes into its own account, and then is paid into the Treasury. Assuming the use of funds from both revenue and loan we are safe in allowing 5 per cent. for interest.

(Taken at Canberra.)

THURSDAY, 15TH MAY, 1930.

Present:

Mr. Lacey, Chairman;

Senator Dooley	Mr. Curtin
Senator Reid	Mr. Gregory
Senator Sampson	Mr. Holloway
Mr. M. Cameron	Mr. Long

Edwin Hubert Henderson, Principal Designing Architect, Department of Works, Canberra, sworn and examined.

6. *To the Chairman.*—I have been in my present position for six months. I am aware of the proposal to establish an automatic telephone exchange at Hawthorn, Victoria, and will be responsible for the preparation of the working drawings should the proposal be approved. The site is situated in Burwood-road, and has a frontage facing south of 71 ft. 11 in., west 213 ft. 10 1/2 in., east 215 ft. 1 1/2 in. and north 79 ft. 6 in., and covers an area of 10,020 square feet. It is proposed to allow for an entrance way of 6 ft. 1 1/2 in. from the west boundary and 11 ft. 1 1/2 in. on the east to give access to vehicles, &c. The site has a fall from north to south and from east to west. It is proposed that the building shall contain the following accommodation:—Ground floor: Trunk room, battery room, power room, lavatory and store accommodation, staff room containing lockers, sink, &c.; the entrances and staircases are placed one on the right-of-way at the east of the building, and another at the north for machinery, plant, &c. A cable well leading from Burwood-road is allowed for along the west wall of the building. The first floor is given over to the switch room leading by staircase from the ground floor. The entrance for machinery is again placed on the north wall with cat-head over. Foundations are to be of reinforced concrete. The general construction of the building will be of brick, the columns and beams of steel, and floors and staircases of reinforced concrete. The roof principals will be of steel with ceilings of fibro-cement sheets fixed to wooden bearers. Direct lighting is obtained from corrugated glass in the roof and through sashes in the ceiling. The soffit of eaves will be sheeted in iron or fibrolite. Owing to the prominent position of the building, it is proposed to use terra cotta tiles on the roof. The whole of the building is to have steel framed windows glassed with wired rolled plate glass. The elevations are designed in brick, with cement finishings. Generally speaking the building will be of simple design and construction, and fire resisting. The mechanical services proposed to be installed are as follows:—

Estimated
Cost.

- | | |
|--|-------|
| 1. Heating and ventilating plant of the oil filtration type with oil type filters for the elimination of dust .. | 1,090 |
| 2. Vacuum cleaning plant | 420 |

The proposed heating and ventilating plant is similar to that recently described by the Director-General of Works in his evidence before this committee in connection with the Brunswick telephone exchange, which proposal was subsequently approved by the committee. Space has been provided in the machine room for the future installation of a full air-conditioning plant if experience shows that such plant is necessary. The estimate for the building, viz., £15,750 is a tentative one based on the preliminary sketches and compared with the cost of similar exchanges in adjacent districts. It is estimated that the sale of the old house on the site will cover the cost of removal and the clearing of the site. Before putting the work in hand and when detailed drawings are prepared the estimate will be

revised and checked. The estimate includes all ordinary electric lighting and power wiring, sewerage and water services. All these services present no difficulties, the necessary main sewers, electric light and water mains being in the adjacent streets. Fire appliances will be in accordance with the regulations governing these services as laid down by the Commonwealth Fire Board for all exchanges. It is the intention to put eight lights in the roof for the lighting of the building. The rooms on the ground floor will be of the following dimensions:—A staff room, 27 ft. x 19 ft. 6 in., power room 28 ft. x 19 ft. 6 in., battery room 28 ft. x 19 ft. 6 in., air-conditioning room 28 ft. x 19 ft. 6 in., store 15 ft. x 11 ft. 6 in., trunk room 87 ft. x 24 ft. The switch room on the first floor will be 100 ft. x 52 ft., less the staircase. It is estimated that it will take about seven or eight months to erect the building. The exchange building will be 54 ft. 8 in. wide and 102 ft. 8 in. deep. I assume that the acquisition of the strip of land 11 feet wide on one side at a cost of £44 9s. a foot was considered desirable by the department in order to provide access for vehicles. The cost of the site may appear to be high, but this must depend upon whether it was possible to acquire a suitable site elsewhere for less. The estimate of cost for erecting the exchange does not include the removal of existing buildings on the land, but it is anticipated that the sale of material will cover the cost of removal. The site presents no difficulties as regards the foundation for the building; it may be regarded as good building land. I understand that the Works Director in Victoria has been asked to report whether the possibility of utilizing the post office area for a telephone exchange had been considered before this site was acquired. The air-conditioning plant will be similar to plants installed in other exchanges in Victoria.

7. *To Mr. Cameron.*—I cannot say if full air-conditioning plants have been installed in any of the exchanges in Melbourne or suburbs. I have been in Sydney for the last seven years, so I cannot speak definitely as to the policy of the department with regard to automatic telephone exchanges in Victoria; but I can ascertain and will supply the information to the committee. At present building costs are somewhat lower than they were a few months ago, and the successful tenderer for this building may be below the departmental estimate. Day labour is now the policy of the department. This building may be erected under that system. I know of no reason why it should not work out as cheaply as contract. My experience is that there is not much difference in building costs under the two systems. For many years now all departmental work has been done by contract. It is difficult to say which is the more economical, day labour or contract. I presume departmental records have been kept showing the relative costs of the two systems. I consider that the work would be done as satisfactorily under day labour as under contract.

8. *To Mr. Gregory.* The policy with regard to the installation of air-conditioning plant is determined by the telephone department. It is not the responsibility of my department. In the plan of the proposed new exchange, sufficient room has been allowed to install a full air-conditioning plant if it should be considered necessary for the efficient working of the exchange. As far as my knowledge goes, no effort was made by either the Postal or Works Departments to ascertain whether the site of the present post office could be utilized for both postal and automatic telephone exchange purposes. I have not seen the site. Extra lights are shown in the roof, because the frames are so placed that lighting from windows in the walls would not be sufficient. The building, as designed with

eight roof lights, will allow light to come down over the frames. The glass is wired, there should be no risk of leakage of storm water, on to the frames. We can guarantee that the roof will be absolutely secure. The roof lighting will not be visible from the main street. I am quite satisfied with the design of the building from an architectural point of view. The base will be of cemented brickwork, and the building, when completed, will be in keeping with others in the vicinity. The side windows will be of wired glass as a protection against fire. In view of the costliness of the equipment and the desirability of preventing dust from entering the building the windows should be kept closed. I will recommend that provision be made to prevent any of the windows in the switch room from being opened except with the approval of the head of the department. The first floor will be of reinforced concrete, with steel girders. Very little timber will be used. Steel work is a little more costly, but is more satisfactory from the point of view of fire risks. The purlins will be of steel, and the tiles will be fastened to special battens. If it is decided to erect this building by day labour there will be a fairly good organization available. We already have clerks of works. It should not be necessary to hunt round Melbourne to get competent men.

9. *To Senator Dooley.*—I am not conversant with the site of the proposed building, and I am unable to say whether the officials of the department inspected other sites that might have been available.

10. *To Senator Reid.*—All the equipment and plant will be on the ground floor, and the first floor will be reserved for the switches. Overhead lighting will be much more satisfactory than lighting from side windows only. The light from the eight windows in the roof will come through another eight frames in the ceiling. Sometimes it is considered desirable to make provision for opening some of the windows in a switch room, but they should not be opened more often than is necessary, in view of the risk of dust settling on the frames. The officer in charge of the exchange should be able to decide whether or not it is advisable to open any of the windows; but if the head of the department is of the opinion that they should be closed permanently, provision should be made for fixed window lights. The height from the ground floor to the ceiling will be 14 ft. 6 in., and the height of the switch room will be 12 feet. The department requires 12 feet to the underside of the beam to clear the frames. The height of the switch room depends on the number of units placed on the frames. I do not think the department has at present the necessary plant to carry out construction of public buildings by day labour. If this policy is put into force, I presume it will be necessary to get the plant together. It is several years now since any departmental work was done by day labour. The previous government favoured the contract system.

11. *To Mr. Holloway.*—My estimate of the time required to erect the building does not include the installation of the automatic telephone equipment. It relates solely to the erection of the building itself.

12. *To Mr. Curtin.*—The proposed building will be almost identical with the new automatic exchange at Brunswick. As far as I am aware there will be no variation in the cost of the respective buildings. I see no reason why the

exchange should be erected to the street alignment, but I assume that the department considers it undesirable to provide recesses in front of official buildings in busy thoroughfares, because of the tendency for people to hang about the building. The exchange will occupy about one half the superficial area of the land. The balance may be required for future extension. I should like to inspect the site before expressing an opinion concerning the desirability or otherwise of erecting the building 12 feet or some greater distance back from the street alignment. Generally speaking, the policy of the department is to keep official buildings in busy thoroughfares up to the street alignment.

13. *To the Chairman.*—The suggestion that if the local governing authority provided a garden effect and became responsible for the beautification of the land, the building might be set back a certain distance from the street line, seems to be a sound idea.

14. *To Mr. Curtin.*—It is possible that, at some future time the Commonwealth Government will require additional accommodation for some of its departments, and it may be desirable to set the building back; but I understand the policy of the postal department with regard to the automatic telephone exchanges is to provide for extensions on the same floor level rather than to increase the height of the building.

15. *To Mr. Long.*—If the postal department approved of a proposal to set the building back 50 feet from the street alignment so as to make the frontage available for other departmental purposes, to meet future needs, I see no reason why it should not be adopted. I assume that the postal authorities prefer automatic exchange buildings to be erected on the street alignment so as to save expense when extending the building. As far as I know there is nothing to prevent the building from being erected some distance back from the street alignment. I cannot say definitely if the plans will permit of an increase in telephone subscribers beyond the maximum number mentioned in the departmental estimates. I have had considerable experience in the designing of public buildings and have a fair idea of the relative costs of construction by day labour and under the contract system. As regards the quality of work done, I know of no reason why the contract system should be preferred to day labour.

16. *To Mr. Cameron.*—I cannot say what proportion of work in departmental buildings is done by day labour. We have clerks of works who could be placed in charge of any buildings that might be erected by day labour; but it would be necessary to appoint foremen, and if we had half a dozen buildings in course of erection, we should have to employ that number of foremen. They would be engaged in a temporary capacity. I think we could rely upon the ability of the men who would be working under the supervision of the clerk of works.

17. *To Mr. Gregory.*—In my estimate of the cost of the building, I have allowed about £33 per rod for the brick work. I cannot say off-hand what is the estimate for the tile roof, but there will be a saving of about £120 if iron is used for the roof. I think the estimate was prepared in Melbourne and was checked in Canberra. Under existing industrial conditions, departmental buildings should be erected more cheaply than was possible twelve months ago.