

1927.



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PARLIAMENTARY STANDING COMMITTEE
ON PUBLIC WORKS.

Admonahan
Clerk of the Senate.
24th Nov, 1927.

REPORT

TOGETHER WITH

MINUTES OF EVIDENCE

RELATING TO THE PROPOSED ESTABLISHMENT OF AN

AUTOMATIC TELEPHONE EXCHANGE

AT

COTTESLOE, WESTERN AUSTRALIA.

By Authority:

H. J. GREEN, Government Printer, Canberra.

MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

(Fifth Committee.)

GEORGE HUGH MACKAY, Esq., M.P., Chairman.

Senate.

Senator John Barnes.
 Senator Patrick Joseph Lynch.*
 Senator Herbert James Mockford Payne.†
 Senator Matthew Reid.

House of Representatives.

Malcolm Duncan Cameron, Esq., M.P.§
 Robert Cook, Esq., M.P.
 The Honorable Henry Gregory, M.P.†
 Andrew William Lacey, Esq., M.P.
 David Charles McGrath, Esq., M.P.
 Alfred Charles Seabrook, Esq., M.P.

* Resigned 30th June, 1924.

† Appointed 1st July, 1920.

‡ Resigned 2nd March, 1927.

§ Appointed 24th March, 1927.

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EXTRACT FROM THE MINUTES OF THE EXECUTIVE COUNCIL—No. 105, DATED, 22ND AUGUST, 1927.

Postmaster-General's Department,
 22nd August, 1927.

Departmental No. 105.

MINUTE PAPER FOR THE EXECUTIVE COUNCIL.

Executive Council.

Subject :

No. 41.

PROPOSAL FOR THE ESTABLISHMENT OF AN AUTOMATIC TELEPHONE EXCHANGE AT COTTESLOE, WESTERN AUSTRALIA.

Approved in Council.

I recommend for the approval of His Excellency the Governor-General in Council that in accordance with the *Commonwealth Public Works Committee Act 1913-1921* the undermentioned work be referred to the Parliamentary Standing Committee on Public Works for investigation for Governor-General, and report thereon to the House of Representatives, viz. :—

24th August, 1927.

Cottesloe, Western Australia ; establishment of an automatic telephone exchange.

Filed in the Records
 of the Council
 (Sgd.) J. H. STARLING,
 Secretary to the
 Executive Council.

(Signed)

W. G. GIBSON,
 Postmaster-General.

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COTTESLOE AUTOMATIC TELEPHONE EXCHANGE.

REPORT.

The Parliamentary Standing Committee on Public Works to which His Excellency the Governor-General in Council referred, for investigation and report to the House of Representatives, the question of the proposed establishment of an Automatic Telephone Exchange at Cottesloe, Western Australia, has the honour to report as follows:—

INTRODUCTION.

1. On the 6th December, 1921, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for investigation and report a proposal to establish an Automatic Telephone Exchange at Cottesloe, Western Australia, as from the 1st June, 1923, at an estimated cost of £44,576.

2. The Committee, after taking evidence in the matter, submitted to Parliament a report, dated 31st May, 1922, recommending that the work be put in hand.

3. In the meantime, however, the then Chief Electrical Engineer, who had been making investigations in America, returned to Australia, and after consideration of certain data that he brought back, the Postmaster-General's Department decided that it would be more economical to continue to use the existing manual telephone equipment until a further study of the subject had been made.

4. During the period of five years which has elapsed since then, conditions have altered, considerable improvements have been made in automatic telephone apparatus, and the proposal has been varied in regard to the number of subscribers' lines to be connected, and the cost per line, consequently it was thought advisable to submit the matter afresh for review by the Committee.

PRESENT PROPOSAL.

5. The proposal now brought forward is to erect a building on a site already acquired at the corner of Clive-road, Cordon-street, and Claremont-avenue, Cottesloe, and to install therein an automatic telephone switching system having an initial equipment for 1,700 subscribers' lines, and an ultimate capacity of approximately 4,400 subscribers' lines. It is proposed that the initial equipment shall be capable of extension to the ultimate capacity named, and thus enable requirements in the proposed automatic exchange area to be met for twenty years after the proposed date of opening.

REASONS FOR THE PROPOSAL.

6. It is stated that the existing manual magneto telephone exchange will not give satisfactory service beyond 1929, and that owing to building limitations it cannot be extended in the existing building. Representations have been made that it would not be economical to utilize the site of the present exchange owing to its distance from the telephonic centre of the area. It is proposed, therefore, to install modern plant in a new building on a new site, in order to give efficient service to the existing and prospective subscribers in the area.

ESTIMATED COST.

7. The estimated immediate cost of the proposal as submitted to the Committee is set down at:—

	£
Site (already acquired)	120
Building	4,750
Air Conditioning Plant	2,080
Exchange Equipment (including that necessary at other exchanges)	34,391
Sub-station Equipment	8,000
Line Plant (Diversion)	400
Sundries	250
	<u>£49,101</u>

COMMITTEE'S INVESTIGATIONS.

8. The Committee visited Cottesloe and inspected the existing manual telephone exchange, and the site suggested for the new automatic installation, and traversed portion of the district which would be served by the new exchange. Careful inquiries were made as to the design of the building proposed, and evidence was taken from local Parliamentary and Municipal representatives and from the Telephone and Works officials concerned with the proposal.

SITE.

9. The site, acquired for the sum of £120, is situated at the corner of Clive-road, Congdon-street, and Claremont-avenue, Cottesloe, and has a frontage of approximately 58 feet by a depth of 166 feet. The area is almost level, good building land, and as it is located approximately at the telephonic centre of the proposed automatic exchange area, it is represented as being quite suitable for the purpose for which it is intended.

BUILDING.

10. The building suggested has been planned to suit the site, and conforms with the requirements of the Postmaster-General's Department. The design is for a fire-resisting structure comprising a switch-room 49 feet by 34 ft. 6 in. for all but 8 feet of its length, when its width is 22 ft. 9 in.; an air-conditioning room 20 ft. 7 in. by 19 ft. 6 in.; a power-plant room 15 ft. 8 in. by 30 feet 7 in.; a battery room 22 ft. 9 in. by 20 feet 7 in.; and a small verandah acting as a covered way to the luncheon room, which will be 17 feet by 12 ft. 6 in. All rooms are to be 10 feet high, with the exception of the switch-room which will be 14 feet high.

11. The construction will be of brick with concrete ceilings and floors with the exception of the luncheon room which for the sake of additional comfort will be given a wooden floor. Window frames will be of steel with wired glass where there is any possible risk of fire. Foundations will be of concrete 12 inches deep and 2 ft. 6 in. wide.

12. Two designs were submitted for the roof of the proposed building, namely: an iron roof with parapet walls, or alternatively a tiled roof with concrete cornices estimated to cost an additional £188.

13. After carefully examining the plans submitted and hearing the explanations of the Works officials, the Committee is satisfied that the building as designed will meet all requirements. In view of the fact that the proposed exchange will occupy a prominent position facing a main road in a locality consisting of good class residences, the Committee is unanimously of opinion that the proposed structure should have a tiled roof—the concrete ceiling to be extended so as to protect the roof timbers from possible risk of fire.

AIR CONDITIONING PLANT.

14. Included in the estimate of cost for the installation of the proposed exchange, is an item of £2,680 for Air Conditioning Plant. This plant, designed to eliminate dust and to regulate the temperature and humidity of the air in the switch room, is said to be necessitated by the fact that the manufacturers of the automatic switching equipment do not guarantee reliability unless the atmosphere of the switch room is kept free from dust, the temperature is kept below 70 degrees Fahrenheit, and the relative humidity is not allowed to exceed 70 per cent.

15. Evidence placed before the Committee indicated that there is some doubt as to whether a complete air conditioning plant is necessary in all cases—especially in those parts of Australia where there are few days of high humidity in the summer—and the opinion was expressed that in small exchanges at places like Cottesloe, experience might show that an elaborate plant was not essential. It was stated in evidence that careful observations are being made and records kept in respect of the air conditioning plants now in existence in other automatic exchanges in Australia, with a view to ascertaining in what way they can be improved, and to what extent they can be reduced in size and cost.

16. Under these circumstances the Committee is of opinion that the installation of a complete air conditioning plant at Cottesloe should be left in abeyance pending further investigation, in view of the possibility of additional information on the subject being obtained by the officials of the Postmaster-General's Department at present travelling abroad.

FINANCIAL ASPECT.

17. It was stated in evidence that the total annual charges, including interest and depreciation, for the proposed automatic system as at the date of establishment, viz., 1st January, 1930, are estimated at £14,981, and five years later at £18,016. The estimated revenue at 1st January, 1930, is set down at £16,125, and five years later at £21,500. The assets thrown spare if the automatic system is installed on 1st January, 1930, are estimated to have a recoverable value of £5,858.

COMMITTEE'S RECOMMENDATION.

18. After carefully considering the evidence received, the Committee unanimously agreed to recommend that the proposal for the installation of an automatic telephone exchange at Cottesloe, Western Australia, be proceeded with.

G. H. Mackay

G. H. MACKAY,
Chairman.

Office of the Parliamentary Standing Committee on Public Works,
Parliament House, Canberra, 13th October, 1927.

MINUTES OF EVIDENCE.

(Taken at Perth.)

TUESDAY, 6th SEPTEMBER, 1927.

Present :

Mr. MACKAY, Chairman;

Senator Barnes

Mr. Cook

Senator Reid

Mr. Lacey

Mr. Cameron

Mr. McGrath.

Ernest Pringle Ramsay, Deputy Director of Posts and Telegraphs for the State of Western Australia, sworn and examined.

1. To the Chairman.—The position in regard to the proposed establishment of an automatic telephone exchange at Cottesloe does not differ to any extent from that which was set out by my predecessor, Mr. Lloyd, ex-Dputy P.M.G. of this State, before the Parliamentary Standing Committee on Public Works in 1922, except that the proposal as it now stands covers the provision of more plant at the outset. When the proposal was before the committee in 1922, the expenditure then specified covered the provision of equipment for 1400 lines, whereas the proposal now before the committee provides for the immediate provision of 1700 lines. The same site as previously specified will be used. The building has been altered so far as the ground plan is concerned in order to provide immediately for the additional lines. The details of the estimated cost of the original scheme and the scheme as now proposed are as follows:—

	Original Scheme.	Now Scheme.
Number of lines to be provided ..	1,400	1,700
Site (already acquired) ..	£120	£120
Building ..	£4,600	£4,700
Air conditioning plant, &c. ..	£3,000	£2,600
Exchange equipment, including that necessary at other exchanges ..	£29,835	£24,301
Sub-station equipment ..	£9,611	£9,600
Line plant, including conduit, cables, and aerial lines ..	£310	£400
Cut-over of equipment and diversion of external line plant; sundries, &c. ..	£200	£250

Taking these items in their order, there is no difference in the site. In the original scheme the building was designed to accommodate an ultimate capacity of 2,300 lines, whereas, the building in the new scheme is to accommodate an ultimate number of 4,400 subscribers' lines. These are the 30 years' figures. In the original scheme the sum of £29,000 was included and covered the provision of vacuum cleaning, heating, ventilating and air-conditioning plant. In the present scheme a sum of £2,500 has been included to cover these services. The difference in the two costs of exchange requirement represents the cost of the additional equipment required for the 300 lines which it is proposed to install over and above the 1,400 lines included in the first scheme. The figure for sub-station equipment remains practically the same; and the number of subscribers at which new apparatus must be installed, namely, 1,400, will remain the same. The additional cost of line plant, cables, &c., is brought about by the larger number of subscribers for

which the new scheme provides, and the same applies to the next item, namely, "Cut-over of equipment and diversion of external line plant, sundries, &c." The estimated number of subscribers' lines to be connected by 1st January, 1930, the date of opening, is 1,500, and the estimated revenue from these subscribers is £16,125. Five years from the date of opening, that is, 1st January, 1935, it is anticipated that 2,000 subscribers will be connected and that the annual revenue will be £21,500. The exchanges in the Perth metropolitan area are:—Central (automatic), Cannington, Cottesloe, Fremantle, Guildford, Maddington, Midland Junction, North Beach, and South Perth. The automatic exchange at Perth is very satisfactory. In regard to the other exchanges, which are all manual, we have heard a number of complaints. My traffic and engineering officers have endeavoured to do the best they can with the existing equipment at Cottesloe, but it is realized by them and by myself that it is quite out of date, and that because of the rapidly increasing number of subscribers, it will be necessary to provide up-to-date equipment in the near future. The Superintendent of Telephones will give detailed records of the delays which now take place, and which, notwithstanding the closest supervision, are becoming worse. My engineer will be able to give information in regard to the obsolete condition of the existing plant, and describe what is an up-to-date equipment. The establishment of an automatic exchange at Cottesloe was recommended by the Parliamentary Standing Committee on Public Works in 1922, but the central office raised the question of a general automatic scheme for the Perth network, and as the result of information brought back by the Chief Electrical Engineer on his return from abroad, an extensive survey of the whole metropolitan area was made. In the meantime, in order to carry on and keep pace with development, the switchboard at Cottesloe was extended, but the time is fast approaching when, notwithstanding all the efforts we have taken, we cannot give at that exchange the up-to-date service the people should have. As a matter of fact, the whole of the manual exchanges in the Perth metropolitan area should be converted, but that is too big an order for the present. That the automatic system is certainly the most up-to-date is amply exemplified by what is being done in America and Great Britain. It is well known that the British Post Office is very conservative in adopting any new method, but it is now going wholeheartedly into the installation of automatic plant everywhere. We have already taken certain action in regard to Fremantle, but there are proposals under consideration for two other exchanges which, if installed, will be automatic. However, the position at Cottesloe is worse than at any other exchange. Cottesloe and Fremantle are our largest exchanges outside Central, but Fremantle's equipment is fairly up-to-date of its kind; whereas, that at Cottesloe is very much out of date, and the room in which it is situated limits the operating, thus tending to inefficient work.

The witness withdrew.

Aidan Hugh Bryan, Mayor of Cottesloe, sworn and examined.

2. *To the Chairman.*—I have resided in the Cottesloe district for five years, and am well acquainted with the position, progress and growth of the district. I was previously living at Guildford, where we had a lot of trouble with the telephone exchange. My business depends to a large extent on telephonic communication, and when I saw a chance of buying a property at Cottesloe I decided to make my home there, partly because of the announcement that it was proposed to establish an automatic exchange there. Cottesloe is very thriving, and is expanding rapidly. The number of occupied houses in Cottesloe municipality, Claremont municipality, Claremont Road district, Cottesloe Beach and Peppermint Grove, the area covered by the lines radiating from the local exchange is 4,529, and the population is 20,000. The network covers approximately 7,000 acres, containing 103 miles of main roads, and 31 miles of constructed footpaths. The capital value of property in the Cottesloe and Claremont municipalities is £1,755,812, and the unimproved capital value of land in the Claremont, Peppermint Grove and Cottesloe Beach-road districts is £409,830. I have taken considerable interest in the proposal to establish an automatic telephone exchange at Cottesloe. Prior to the last Federal election I telegraphed to Mr. Watson, the member for Fremantle in the House of Representatives, to secure from the then Postmaster-General a statement as to when the exchange was to be built. The reply we received was that plans of the building were being prepared, and that very shortly the exchange would be built. We were satisfied with that information for the time being, but on 19th August, 1925, a public meeting was convened of representatives of the different public bodies in the area, and a large gathering decided to press for the undertaking being fulfilled, and for the erection of a new post office. It was pointed out at the time that the post office, in which the manual exchange is now housed, was 25 years old, very inconveniently situated, unpretentious in style, out of date, and generally not in keeping with the progress of the municipality of Cottesloe. These resolutions were forwarded to Melbourne, and the next we heard was that the Public Works Committee was coming over to Perth. I have used the automatic exchange in Perth extensively, and I can say that in comparison with it the manual system is slow and inefficient. There are long periods of waiting and numerous cut-offs. Generally it is difficult to get through and hold the line for any period of time. Cottesloe is primarily a residential suburb. There is a commercial centre close to the railway station, which would, I am sure, provide numerous applications for connection. With an automatic exchange I should expect a large increase in the number of subscribers. We have large numbers of people in our district during the summer months. We have within our municipality three railway stations, Cottesloe Beach, Cottesloe, and Swanbourne, and last year these furnished 2,026,012 passengers, representing one-fifth of the passenger traffic for the whole of the Perth metropolitan railway system. We have not many public street telephones, there are some at the beach to deal with the rush traffic during the bathing season. We have an influx from 3,000 to 4,000 people from November to the end of March. The figures I have previously quoted relate to the normal population. Knowing nothing of the technical side of the matter, I should say that possibly Fremantle ought to have an automatic telephone service before Cottesloe, but it must be remembered that the latter is the only exchange between the port and Perth. I do not think that the Cottesloe equipment is up to date, because at times it is a difficult task to get

through. From the point of view of the user I should like to see all the metropolitan exchanges converted to automatic. My Council has discussed the matter of the site for the new exchange, and we are agreed that it is the best in the interests of the district. As a matter of fact it is an ideal site, being grouped among other public utilities, and quite close to the police station and fire station. From a town planning standpoint it is situated in the best position in which a telephone exchange could be placed, but it is not the best site for other postal purposes. We intend to press for the erection of a new post office in the business area nearer the Cottesloe railway station. I have not had an opportunity to see the plan of the proposed building, but I understand that it has to come to our council for approval. It is to be built in a brick area. We should like it to have a tiled roof. The majority of the houses in the district are tiled. There is plenty of water in the district for fire purposes. A 30-inch main runs past the site of the proposed building.

3. *To Mr. Lacey.*—I think that the estimate given by the deputy director relative to the proposed development of Cottesloe is on the conservative side. I do not know the condition of the Fremantle exchange. The site of the proposed Cottesloe exchange is really on the Cottesloe boundary, but it is the centre of the heaviest populated area of Cottesloe and Claremont.

4. *To Mr. Cameron.*—The proposed exchange would serve more than the municipal district of Cottesloe. As a matter of fact, I understand that it will take in some of the people of North Fremantle, but I have not included them in my figures. I do not think that I have fared better with the manual exchange at Cottesloe than I did at Guildford. Because of its fewer subscribers the Guildford exchange probably gave the better service. At the public meeting to which I have referred there were pretty strong expressions of opinion in regard to the service provided by the Cottesloe exchange; our town clerk was most emphatic in speaking of the cut-offs, interruptions and general overloading of the exchange. He said that the overloading did not tend to efficiency. I do not want my remarks to be construed as being a complaint against the attendants at the exchange. They are doing their best, and are most obliging in all cases. But when you are talking the voice fades away, and you get the "engaged" signal. It is, I understand, owing to the transfer of the control from board to board. We attribute our difficulties to the congested state of the exchange. There is no complaint against the operators themselves.

5. *To Senator Reid.*—I think that Government plans are sent to our municipal council as a matter of courtesy, and for the purpose of supplying information for statistics, more than for anything else. All the Government jobs done in the district have been up to the standard. We have a good class of houses in Cottesloe. We put a link on the value of a house that can be erected on a block of the railway. At Peppermint Grove the blocks are large, whereas in our municipality we have quarter-acre blocks. Thus there are only 271 houses in Peppermint Grove, while there are 1,161 in Cottesloe. Every year 120 houses are erected in our district. In Nedlands during the last six months over 200 houses have been built, and this increase is likely to continue, because, owing to the absence of roads, there is no other direction in which the metropolis can expand, except perhaps to the north of Perth, which area is already supplied by the central automatic exchange. Cottesloe people who have telephones installed in their homes are worried out of their lives by summer visitors coming to them and asking permission to ring up their homes. Beach businesses have to cater for all this use of telephones, but more public telephones would cope with it. They would need to be removed during

the winter, but half a dozen installed on the beach should prove profitable investment during the summer months. My council would like to see the telephone wires off the streets, and run along the right-of-ways. As a matter of fact, I think the people of the district would rather see the wires put across their backyards. We would certainly prefer to have them put underground. At present they interfere with our street trees. The department has pollarded these trees, and effectively killed them.

6. *To Mr. Cook.*—The public meeting to which I have referred was representative of the whole of the district concerned. Mr. Watson, our member, asked me to get an expression of opinion from the people. All the different local bodies were invited to the meeting, and they were all in agreement in regard to the proposed site.

The witness withdrew.

Charles Frederick John North, Representative for Claremont, in the Legislative Assembly, Western Australia, sworn and examined.

7. I have resided in Cottesloe for many years. My family was among the first settlers in 1897. Fremantle and Perth are 12 miles apart, and this is the only exchange between them. The fact that the electoral roll for the Claremont electoral district, which includes the municipalities of Claremont and Cottesloe, and the road districts of Cottesloe, Claremont and Peppermint Grove, has increased during the last three years from 7,000 to 11,000 adults, best illustrates the progress of the district proposed to be served by this exchange. It is a large roll for a State seat in Western Australia. The population is certainly over 20,000. When the Cottesloe exchange was established many years ago, there was a single line of railway from Perth to Fremantle, and the exchange had to serve a very large sparsely populated district. There were very few houses in the area. To-day it is filled up with houses. The population must increase, because Perth cannot develop, except between Subiaco and North Fremantle. There are five commercial centres in this large residential district, served by the West Subiaco, Karrakatta, Claremont, Swanbourne, Cottesloe and Cottesloe Beach railway stations. The interruptions to conversations at the Cottesloe exchange are more noticeable than at other manual exchanges. The cause of this I am not prepared to say. I simply make this statement. Others have made the same remark. It is said that the trouble is due to the switchboard at Cottesloe being overloaded. I do not suggest that the staff at Cottesloe is responsible for the telephonic delays. The staff is obliging in every way. Many years ago the residents of the district were informed that they were to have an automatic exchange, this decision, I understand, being reached on the expert advice of the department, and why delay has taken place I am not aware. Whenever I go to the eastern States, I find two or three automatic exchanges being established there. It is whispered that the plant intended for Cottesloe was side-tracked and absorbed in one of the eastern capitals. As the legislative member for the district, I may say that the people of Cottesloe were most disgusted that, after hearing that an automatic exchange was to be installed, the matter was postponed. Any statement that the exchange was put elsewhere because the people of Cottesloe did not require it, is not in accordance with the facts. The district has advanced in population faster than any other district now served by a telephone exchange in this State, and I think that the original ambition of the department to install a new exchange at Cottesloe should be carried out at the earliest opportunity. Because of the strong action of the sea air, tiled roofs

are a much more economic proposition at Cottesloe than galvanized iron roofs. I am surprised to learn of the delay in undergrounding the wires in the district to be served by this exchange. Before it is done in more sheltered districts, it should be done in Cottesloe, because of the terrible loss every year through posts being blown down during heavy storms. This applies more particularly to electric lighting poles, but I think the Postal Department would be well advised to underground the telephone wires.

8. *To Mr. McGrath.*—I do not wish to convey the impression that the eastern States have automatic telephone exchanges everywhere, but I know that Perth, the smallest and least important capital, was chosen for an experiment with the automatic system when the latter was not too well known, and that, when it proved a success, automatic exchanges have grown up like mushrooms in the eastern States. There are several in Melbourne and Sydney, whereas there is only one in Perth. I did not know that an alteration in the plans would require a fresh submission to the committee. My statement of the Cottesloe proposal to this committee. My statement in regard to the fact that there are more interruptions and faults at Cottesloe than anywhere else is based on my own observations, and upon the remarks made by friends. The average person does not go into details. The remark usually made is, "I wish we had the automatic." I think it will be found that there are special reasons why Fremantle and other manual exchanges can carry their load better than the Cottesloe exchange. I know that on several occasions the department has announced that Cottesloe is overloaded. I think that the estimate of the department as to the likely development at Cottesloe is a very good one. It does not do to be too ambitious in these matters, but there must be a steady development in an area which lies between the capital and the port.

9. *To Mr. Cameron.*—I live in Cottesloe, but my office is in town, so that I am in a position to compare the automatic and manual systems. The comparison is as that between the trans-Australian railway, and the Perth-Kalgoorlie railway. I was in the Cottesloe Council for two years, and mayor of the municipality for one year. I endorse the remarks of the mayor in regard to the development of the district, and the need for an automatic telephone exchange.

10. *To Senator Reid.*—I do not wish to make use of extravagant language, and I do not suppose that the loss of a promised automatic exchange would matter as much to the people of the district as would the loss of thousands of pounds, but several years ago Cottesloe was selected by the experts as a district that should have an automatic exchange, and there was natural disappointment when its installation was postponed. The disappointment was there although it was not expressed by a large gathering. I am informed that the matter was left in abeyance owing to the lethargy of the public, as if it was their business to complain. The Perth automatic exchange has given entire satisfaction to the public. There was a period when it was slightly over-loaded, and the public complained without knowing the cause. But that trouble has been remedied, and the exchange is now giving marvellous service.

11. *To Mr. Cook.*—Some parts of Perth go ahead quickly; other localities are more select and, because of the better type of homes, have higher values. Peppermint Grove is looked upon as a de luxe suburb. There is not much room for expansion there. Expansion will come in the Cottesloe Road district, and towards Nedlands and Dalkeith in the Claremont Road district.

Present:

James George Kilpatrick, State Engineer, Postmaster-General's Department, Western Australia, sworn and continued.

is proposed that the initial equipment shall be capable of extension to the ultimate capacity named, and thus enable requirements in the proposed automatic exchange area to be met for 50 years after the proposed date of opening. The existing manual magneto telephone exchange will not give satisfactory service beyond 1928, and owing to building limitations cannot be extended, and owing to building limitations cannot be extended to utilize the existing site owing to its distance from the telephonic centre of the area. It is proposed therefore to install modern plant in a new building on a 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)	120
Building	4,750
Air Conditioning Plant	2,500
Exchange equipment (including that necessary at other exchanges)	34,391
Sub-station Equipment	6,000
Line Plant (Diversion)	400
Sundries	250
	<u>49,011</u>

The actual revenue for the year ended 31st March, 1927, and the annual revenue it is estimated will be obtained on the date of opening and five years thereafter is shown hereunder:—

Average number of Subscribers' Lines connected during the year ended 31st March, 1927.	Actual Total Lines received for 1927.	Estimated number of Subscribers' Lines, 1st January, 1930 (date of opening).	Estimated Revenue, 1st January, 1930.	Estimated number of Subscribers' Lines, 1st January, 1935 (five-year date).	Estimated Annual Revenue, 1st January, 1935.
1,164	£12,570	1,500	£10,125	2,000	£21,500

The proposed site is situated at the corner of Clive-road, Congdon-street, approximately 55 feet by 166 feet. Its dimensions are contained approximately at the telephonic centre of the proposed automatic exchange area. It is proposed that the building shall be of simple design and built on the latest fire resisting principles. The immediate installation in the exchange is for an equipment of 3,700 subscribers lines, but the building will be designed to accommodate equipment having a capacity of approximately 4,400 lines. The financial aspect is set out in the following table:—

Expense is set out in the following table—		At the 1.1.30
		£
1. Capital cost—new	40,011	72,088
2. Capital cost—renew and in situ	90,253	110,330
3. Annual working expenses of proposed automatic exchange	5,721	6,647
4. Total annual charges for proposed automatic exchange	14,965	17,990
5. Annual revenue— Actual for year ended 31.3.27, £12,570. Estimated as at 1.1.30	16,125	
Estimated as at 1.1.35		21,600
6. Assets recoverable or thrown away if an automatic ex- change is established on new site on 1.1.30— (i) Book value	11,107	
(ii) Recoverable value	6,558	
(iii) Cost of recovery	318	
7. Estimated annual working ex- penses of existing manual exchange	7,727	
8. Estimated annual charges for existing manual exchange	14,004	

The difference between sub-items (i) and (ii) of item 6, namely £5,309, 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. Justified after the automatic exchange is put into effect, it will show a saving of about £2,000 as against the manual exchange, but the total annual charges will only be about £1,000 less than the annual revenue, owing to the fact that, although the operators in a manual exchange may not be paid for the automatic exchange, the interest on the capital cost is higher. The advantages of the automatic exchange is undoubtedly better for the department, as main-tenance costs are less; but apart from that fact, we cannot carry on at Cottlesloe under present conditions. We must have either a new manual exchange or a new automatic exchange. The existing exchange is obsolete. The jacks are getting very much worn, and as they are of an obsolete type, we would need to have others specially made to replace them. I do not know that among telephone operators the marriage rate is higher than it is in other walks of life, but we train girls for six months—it takes them that time to get ready to work—and then they leave. This trouble is experienced by telephone administrations throughout the world, and it is one big point in favour of establishing automatic exchanges. The complaints the committee heard

The complaints the committee heard exchanged in regard to the existing service at Cottesloe are undoubtedly justified. They are due to the fact that the plant is obsolete. It would be quite all right if the average number of faults per subscriber were low, but at Cottesloe the average is high. If four calls come in at the same time, the four calls have to wait because the girl cannot handle four at once. That slows down the plant. The complaints you have heard in regard to the manual exchange would apply to a minor extent to the automatic exchange. But I doubt if the complaints in regard to slow operators as compared with the automatic system are altogether due to the obsolete apparatus. Subscribers sometimes fail to ring off. They do not give the operator an opportunity to know whether they have finished their conversations, and the consequence is they hold up the lines for quite a long time. When a caller fails to ring off and then wants to ring up again, his subsequent ring is taken as his ring off. The calling rate at Cottesloe is 4.00; at Perth it is 3.25. That is the average number of calls each subscriber makes on each line during the winter. The average speed of answering the calls on an automatic exchange is about five to six seconds, whereas in the manual exchange at Cottesloe it is 10 seconds, and the average in a normal manual exchange is 8.5 seconds. These figures show that the speed of answering at Cottesloe is slow. The speed of disconnecting at Cottesloe has gone as high as 16 seconds; but that is not due to laxity on the part of the operators. The exchange is watched very closely by the supervisors and the operators. On account of its slow type of operating supervisors are very keen to see that the operators disconnect as soon as they get the clearing signal. In an automatic exchange the disconnection is instantaneous. There is an indirect serving with an automatic exchange, because the lines are only held for conversation purposes, and it is not necessary for the department to provide so much plant as is required in a manual exchange where you have the lines held up and not in conversational use. It is a fact that the committee has considered a proposal to establish an automatic telephone exchange at Oakleigh, in Victoria, for 1,000 subscribers, with an ultimate capacity of 4,000; as against the 1,700 subscribers for Cottesloe, with an ultimate capacity of 5,000; and that the cost of the Oakleigh plant is £24,735, against £24,331 for Cottesloe; but the explanation is that the initial installation at Cottesloe is for 400 more subscribers than at Oakleigh, and on direct ratio the cost at Cottesloe should be approximately £23,000 as against £24,000 at Oakleigh. Furthermore, in addition to the equipment at Cottesloe, we have to equip Fremantle

and the other manual exchanges with automatic equipment working in Cottesloe. This accounts for the extra £1,000 Oakleigh they have. Malvern, Collingwood, and Carlton already fitted with this equipment.

It is possible that a number of subscribers already on an automatic exchange will be connected with the new Oakleigh exchange. That may account for the fact that for sub-station equipment only £4,000 is required at Oakleigh, whereas for sub-station equipment at Cottesloe we estimate £10,000 will be required. Newlands is about three miles from the site of the proposed exchange.

We have a few people there on the Perth automatic exchange who will probably be connected with Cottesloe. Other residents of Newlands are connected with the Cottesloe manual exchange. On the 28th June, 1927, the humidity in Perth outside the exchange was 90 per cent. The exchange it was 77 per cent. This shows that the ventilating plant was keeping the humidity in the exchange down to normal, although we generally try to keep it down to 70 per cent. It is necessary to have a steady humidity in the exchange throughout the whole year, and this is obtained by having an air conditioning plant. The average humidity in Perth is fairly steady, but you get some high peaks. Strange to say, at Cottesloe on the date I have mentioned, it was only 65 per cent. in the Cottesloe exchange. The humidity is no air conditioning plant in the exchange now, but the windows were all kept closed. The air conditioning plant in the Perth exchange is satisfactory to a point. It is employed mainly for the purpose of keeping dust out. However, it is not a good plant, and when it reaches the end of its useful life, it must be replaced. Even to-day, if I could do it, I would replace it by a modern plant. Since its installation ten years ago, there has been considerable improvement in air conditioning.

The Electrical Engineer obtained a lot of useful information about air conditioning in America, where automatic exchanges are designed to a high degree. The conditions for the Perth automatic exchange are pretty bad when the humidity is high, and when it is necessary to shut all the windows. The Perth plant was designed by the Mechanical Engineer of the Works and Railways Department, Melbourne. All air conditioning plants can be made in Australia. The dictating plants can be made in Australia. The parts are standardized, and we obtain locally. I cannot give much information regarding the cost of a mechanical plant of this description, because we do not handle such matters. That work is done by the Works and Railways Department; we tell them what we require, and they design the whole thing and give us the cost. I am satisfied that a complete plant should be installed in the Cottesloe exchange.

There will be three mechanics, one assistant, and a foreman working in the exchange. The cost of eleven operators and two mechanics. If approval is given by the committee to the proposal, the exchange should be ready for service on the 1st January, 1930. The site selected is the most satisfactory position nearest the telephone central office to the district. It is possible in a suburb like Cottesloe to get a site practically in the middle of the district. That cannot always be done in the city.

A telephone survey is being carried out by the department. The method followed is briefly as follows:—An officer will proceed along various streets; he will interview land agents and people of that description; and examine the type of buildings existing, using that knowledge as an indication of the type of building likely to be constructed in the future; he will mark on a plan every existing subscriber and all potential subscribers, indicating a particular area that is known as "spotting."

This experience enables the department to get a fairly accurate idea of the number of subscribers in one particular street. He takes

each street in turn. The map shows a series of dots very close together in the shopping area. The plan is then divided into inch sections, and all the dots in each are added downwards and across. This enables you to determine where the greatest congestion will be. There is no danger of this kind, having regard to future development. Three miles is a reasonable length of line from the telephone centre. It all depends upon the congestion. At the outset the exchanges were about six miles apart. For instance, Brighton was six miles from Windsor, but development has been so great that they have found it necessary to establish an intermediate exchange at Elsternwick. The economies would be against having shorter wires at Cottesloe, and another branch for the area for the next total number of subscribers for the area for the next five years is not likely to exceed 2,000. To establish a branch exchange would mean having two 1,000-line exchanges. I believe that there is some trouble in exchange. I believe that there is some trouble in exchange. I believe that there is some trouble in exchange.

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13. To Mr. Lacey.—The fault with the manual exchange at Cottesloe is mainly due to slow service. The subscribers are cut off, or kept waiting a long time. The exchange does not compare favorably with other manual services in the metropolitan area. It is also slow. It is undoubtedly a slow board. It also becomes noisy. You get a high resistance connection due to the plugs not making proper contact. This is disastrous to trunk calls. It is entirely due to the wearing of the jacks. The Cottesloe plant has reached the end of its useful life. World-wide experience has shown that subscribers increase in numbers with the establishment of an automatic exchange. By giving a good service, we get more subscribers. Our figures in regard to our estimated increase are based on past results, and we have not taken into consideration the fact that we propose to give a better service. Our development officer does not know whether he is estimating for a manual or an automatic exchange. He makes his survey solely on the possibilities of the district. For instance, a dense population in small cottages may not be a telephone population. Port Melbourne is not a telephone area. There may be only two subscribers in a congested area. On the other hand, I think it is safe to say that in time every

other house in Cottesloe will be connected with the exchange. Rentals are £5 a year within a certain radius from the exchange. I do not see how it is possible for any subscriber in the area served by the Cottesloe exchange to pay £2.

14. To Mr. Cameron.—It is difficult to staff Cottesloe at present because of the old plant in use. Many local calls have to be passed from the operator who takes them to another operator on the same switchboard. The service is becoming worse and worse. The board is inclined to ask to be transferred. They cannot be blamed if they are slow. The Department is not finding any difficulty in staffing ordinary manual stations except, of course, the difficulty of girls leaving to get married. After a time operating girls leaving to get married. After a time operating girls leaving to get married. After a time operating girls leaving to get married.

15. To Senator Reid.—If Cottesloe were a good exchange, we would not think of putting in an automatic exchange. We do not scrap any exchange simply for the sake of giving an automatic service. Many exchanges should be allowed to continue in operation until the end of their useful life. It is true that a large proportion of the old equipment at Cottesloe will have to be scrapped, but the equipment of the exchange has already paid for itself over and over again, and in any case the scrapping will only be a book entry. In order to underground wires, we must first provide a conduit or pipe at the cost of £800 a mile. On the other hand, a pole line costs at the cost of £150 a mile. The cost of the cable per pair in a conduit is very much less than the cost of wires per pair in a pole, because they are smaller and more concentrated. But you cannot have all the wires underground; the cable has to come up somewhere, and you must put up poles. There might be a case for undergrounding at Cottesloe if all the people were subscribers, but in a scattered area like that we would have long pieces of cable between houses, which would be serving no useful purposes. With a pole line we simply go straight off to the house which is to be connected with the exchange. This means a saving in cost. Wherever it is economically sound to do so copper. Wherever it is economically sound to do so copper. Wherever it is economically sound to do so copper.

16. To Mr. Cook.—Cottesloe is a residential area. There are some secondary industries in Perth. They are on the increase because Perth is going ahead very rapidly. There are woollen factories, motor engineering shops and furniture making establishments. But Perth is at a disadvantage compared with the Eastern

States. It has been stated that immediately an industry is started here, the Eastern States will undercut it. In any case a factory area is a very poor telephone area. A factory covering 10 acres of ground may require five lines. The same area covered by residences may require 200 lines. Factory hands are not telephone users. I understand that in America where the public have the telephone habit, the telephone is installed in the same way as the gas and electric light. In the event of a substantial increase in secondary industries in Perth, Cottesloe would not be the area for them. I think Victoria Park is going ahead faster than Cottesloe, but it is not a telephone area. The type of houses at Victoria Park is smaller than at Cottesloe, where very substantial buildings have been erected. The number of dwellings in Cottesloe in 1923 was 4,882; in the following year the number increased to 5,201; in 1925, the number was 5,264. Those are the latest figures I have, but there is a lot of building in progress now.

17. To Mr. Barnes.—It is possible to overload an automatic exchange, but we have made provision to avoid that in the new Cottesloe exchange. Perth was rather a bad example at the first cut-over. It was one of the first automatic exchanges in the Commonwealth, and the public had a poor telephone system previously. At first there was insufficient gear in the exchange to carry the load, and we had to get additional plant. Since then the apparatus and the plant have improved. In recent years there has been very keen competition among the manufacturers of automatic equipment. The statistics over a period of 10 and 12 years show that we are not likely to overload the Cottesloe exchange. We shall always have a little in hand. We expect 1,500 subscribers at the date of opening, but we shall be installed for 1,700. That will give us 200 in hand, and all the gear necessary to prevent overloading. The rent of a telephone is based on the distance of the subscriber from the exchange. In the metropolitan area the rent is 25 per annum, but if a subscriber is beyond the exchange area he pays something extra.

18. To Mr. McGrath.—People at Claremont are connected with the exchange at Cottesloe. No other exchange in the Perth metropolitan area is in as bad condition as Cottesloe. Fremantle is a common battery exchange, which was an improvement on the magnet type of exchange. Before the automatics were installed, common battery exchanges were installed. The Department has no immediate intention of dealing with Fremantle. We may possibly do something there in 10 years' time, but it all depends upon development. As far as possible, the Department is up-to-date with connections. We cannot give applicants instantaneous service, because sometimes it may take three weeks to get the line plant up to a particular house. Generally speaking, however, we are up-to-date with applications. We have been waiting for switchboards for quite a long time. They are imported. Some were made in the Melbourne workshops during and just after the war, but the costs were far too high. Each part may have to be made here by hand, but abroad they are all punched. If the Cottesloe exchange were my own proposition I would recommend it. Apart from the necessity of abolishing the old exchange, it is a financial proposition to establish an automatic exchange at Cottesloe.

19. To the Chairman.—There are 1,348 subscribers on the manual exchange at Cottesloe. The average during the year is 1,164 subscribers. They expect to open the new exchange with equipment for 1,700, but with immediate connections for 1,500 subscribers. When the proposal was examined in 1924 the estimated cost was £29,000. It is now £34,000.

The difference is accounted for by the fact that originally it was contemplated to connect only 1,400 subscribers. The present proposal is to connect 1,700 subscribers. There is a certain amount of difficulty in working an automatic exchange in connexion with a manual exchange, but the trouble is largely due to the manual element at both ends. From a public service point of view, it would be better to convert the whole of the manual exchanges to automatic, but from an economical point of view, it would not. The automatic offers every prospect of giving a cheaper service. Telephone rentals are cheaper in Australia than in other parts of the world. No charge is made for connecting a subscriber's house with the exchange. If the house is outside a certain distance, necessitating additional line work, we charge a higher rent, which is regulated by the cost of material.

(Taken at Perth.)

THURSDAY, 8TH SEPTEMBER, 1927.

Present:

MR. MACKAY, Chairman;
Senator Barnes Mr. Cook
Senator Reid Mr. Lacey
Mr. Cameron Mr. McGrath
George Sydney Cook, Commonwealth Works Director for Western Australia, sworn and examined.

20. To the Chairman.—Plans for the proposed automatic telephone exchange at Cottesloe have been prepared by the central office of the Works and Railways Department under the Director General of Works, who is in touch with the central branch of the Postal Administration. All telephone exchanges are designed by our central office. In a covering minute I have been asked to check the estimate of local conditions. I am advised by my knowledge of local conditions that may be expected to make any amendments that may be necessitated by local conditions. For instance, there are many building materials available in the eastern States that are not available here. I should not think of specifying a lead damp course, which is not available here. I would use a course suitable to the circumstances. The estimated cost of the building as per blue print furnished is as follows:—

- (a) Iron roof and parapet walls £4,702, including room for air-conditioning plant.
- (b) Tiled roof and concrete cornices, £4,950, including room for air-conditioning plant.

If the room for the air conditioning plant were omitted the deduction would be £250, and the estimated cost would then be—

- (a) £4,512.
- (b) £4,700.

The building is of brick in lime mortar generally, but is in cement mortar to ground level and in piers under girders. The building consists of a switch room 69ft. x 34 ft. 6 in. over the bulk of its length—all but 5 feet in fact; an air-conditioning room, 20 ft. 7½ in. x 10 ft. 6 in.; a power plant room 15 ft. 8½ in. x 20 ft. 7½ in.; a battery room 22 ft. 9 in. x 20 ft. 7½ in., and a small verandah acting as covered way to luncheon room, which is 17 feet x 12 ft. 6 in. All rooms are 10 feet high with the exception of the switch room, which is 14 feet high. The luncheon room is provided with a wooden floor for comfort, while the other rooms are designed with concrete floors, to be thoroughly damp proof. These are in two layers, with 4-inch mineral asphalt dampcourse between layers. The slabs must necessarily be filled to floor level, and it is considered that all danger of dampness will be eliminated. As a protection against dust from concrete floors by wear a surface

composed of magnesium chloride and cement will be provided in the switch room, while the battery room floor will be painted with an acid resisting paint. Concrete ceilings have been allowed for, the concrete being composed of coke breeze, sand and cement. They will protect the equipment against fire from external sources, eliminate dust and protect the equipment against sudden rises and falls in temperature. The walls in the air-conditioning room internally will be of plain exposed brickwork, while all other walls will have cement dados with plastered walls to permit of easy detection and rapid removal of dust. The plan shows alternate treatments for (a) galvanized iron, and (b) tiled roofs. The latter method is recommended as being more suitable to the locality. The site and building will be in full view of the Perth-Fremantle-road, and will be even more prominent by reason of the building being set back from this road by the two chains width of Congdon-street. This latter street should, in years to come, be an attractive avenue, and it is safe to say that tiled roofs will predominate in this locality. The treatment permits of the concrete ceiling being continued as a cornice which will protect the roof timbers from stray sparks, and the setting back of the roof is shown on the plan will prevent danger of falling tiles and meet the requirements of the local authorities. In the event of this treatment being adopted a continuous concrete lintel will replace the four top courses of brickwork. This will reduce the danger of the breeze concrete ceiling and overhanging cornice cracking, and will give the extra strength required for the weight of the tiled roof, &c. Steel frame windows are allowed for, and these, with other features referred to previously, should reduce to a minimum the possibility of the building catching fire from external sources. Fire protection inside the building is provided for by six chemical extinguishers and four buckets of sand, which will be the first line of attack. A hydrant and hose placed outside the building will be available, and the fire station is just on the other side of the street. The estimate includes provision for a septic tank installation to conform to the recent decision to install this method of disposal in the district. The cable well is but a few feet removed from an existing cable manhole, and connection is convenient and easy. It is essential that this chamber be kept perfectly dry, and for this reason a vertical damp proof course of mineral asphalt is indicated, as well as the horizontal course provided for the floors. The estimate of cost prepared by Mr. Solley, our quantity surveyor in Melbourne, is as follows:

WORKS AND RAILWAYS.

The Director-General of Works. Brection of Telephone Exchanges at Cottesloe, Western Australia.

The estimated cost of the above telephone exchange, in accordance with plan No. A/1849, will be Four thousand seven hundred and fifty pounds sterling (£4,750). This estimate includes for building complete, including outbuildings, and tar-paving or gravelling half of back yard.

Cost of main building	£4,600
Cost of outbuildings, gates, fencing, and paving to yard	150
	£4,750

*Separate estimate for engineering services—
Vacuum cleaning plant only 400
Compressed air service plant only 220

	£5,370
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NOTE.—Should a complete air-conditioning plant be required at some later date, its probable cost, including direct radiator heating with oil-fired boiler, would be about

If alternative elevation of building with tile covered roof is adopted, the estimated cost would be	£4,520
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(Sgd.) E. W. SOLLEY, Quantity Surveyor.

I have been instructed to make my own estimate, bearing local conditions in mind. I should think that for a building costing up to £5,000 costs are slightly less in Perth than they are in Melbourne. When I came here from Melbourne 2½ years ago I found that I was estimating a shade on the high side. A lot depends on the type of building. For concrete and plastering work, and particularly for galvanized iron work, I think we are a shade under the Melbourne costs, but when it comes to patent roofing compositions for flat roofs, such as bituminous felts, we are not able to face eastern prices. That is probably due to the fact that Western Australia has to pay extra freight. In Government buildings flooring is cheaper in Western Australia. Almost every decent building in Melbourne is now specifying jarrah for floors carrying heavy traffic, and almost solely for verandahs which are exposed to the weather. Government specifications require jarrah for fence posts. In that respect, therefore, Western Australia is bound to be cheaper than Melbourne. I do not think that any timber is absolutely impervious to white ants. I know that where there is no other timber available, jarrah is attacked by them, but it is certainly very much less liable to attack than pine, or practically any other Australian timber. White ants will tackle any other timber before they will touch jarrah, but in the north-west, where they have practically no other timber to attack, they go for jarrah. Very good local bricks cost 6½s. a thousand at the kiln. They are about the same price at the kiln in Melbourne, but the kilns there are closer to the city, so that the prime cost of bricks in Melbourne would be somewhat lower than in Perth. On the other hand, the finished cost of brickwork here is less than in Melbourne. For general purposes in the Western Australian post offices it costs about £40 a rod in lime mortar. The tiles made in Western Australia are of very good quality, and one very pleasing factor that is absent in other States is the guarantee given by the tile makers here. They prefer to lay the tiles, and they guarantee them for twelve months. The result is that we are getting better average roof tiling in Western Australia than we were getting in Melbourne prior to my coming over here. There is every chance of roofs being waterproof in Western Australia, because of the method adopted. There are so many tile factories in the eastern States, that none of them will pick tiles for the builder; he has practically to take them as they come. In those circumstances it is almost impossible to get a perfect roof. When I was in Melbourne the price for tiling was £3 10s. a square. In Perth the prices vary from £4 to £4 10s. a square. Cement costs 2½s. 6d. per cask in Perth. There are six approved immediately, it would take about eight or nine months to build. If it were approved in three months' time, we could improve on that estimate. The reason is that the brick shortage in Perth is rather pronounced; but the State brickworks have just received their transformers, which are necessary to give them the power they require, and I am informed that they hope to be able to overcome the shortage in the very near future. If the supply of bricks were adequate to demands, the work of erecting the building at Cottesloe could easily be finished within six months. I am quite definite in stating that I would rather have a tiled roof than a galvanized iron roof. My department is responsible for the air conditioning plants installed in automatic exchanges. The Central Engineers of the Postal Department indicate what humidity they require, and the area of the room to be conditioned, and then the Chief Mechanical Engineer of the Works and Railways Department designs a plant to meet the circumstances. In Perth we get persistent rains during June, July and August. The weather is very dry for

the rest of the year. Beyond that I have no information. An air conditioning room has been provided for the Cottesloe exchange. In a minute to me my chief in Melbourne says—

"Should a complete air conditioning plant be required at some later date, its probable cost, including direct radiator heating, with oil-fired boiler, would be about £2,680."

As far back as 1922, the work of designing telephone exchanges was taken out of the hands of the Commonwealth works directors for the various States. The central office has experts on matters dealing with ventilating plants. Having estimated for a plant, the central office has no doubt estimated on some definite figures, and designed a building to accommodate whatever plant is necessary; but what that plant is I do not know. I have seen no plans of the air conditioning plant to be installed in this exchange. There is a good water service available from the street passing the exchange. The site necessarily requires filling up to the floor level. There is a perceptible fall in the land, and it will cost £62 10s. to fill it up to floor level. The expense will not be altogether without its advantages. The telephone people are keen to eliminate as far as possible, all dampness, and the fall in the ground at Cottesloe, which necessitates the filling, will help in itself to prevent that dampness. The soil is sandy, providing a good foundation. The block is 157 ft. 8 in. long by 58 ft. 3 in. wide. We shall be building to both boundaries of the block. I think that is satisfactory. One of the things always taken into consideration is the possibility of future expansion. Our experience has shown that almost every building erected to-day in any important locality will be extended within 30 or 40 years. At Cottesloe I think it is wise to utilize the whole of the space available in the first instance. The rooms built on the boundary of the adjoining block are the machinery and battery rooms. The matter of ventilation for the persons occupying this kind of building is hardly a matter of great concern. If the rooms were housing numbers of people, I should prefer a passage space between it and the boundary of the next block. That would also be advisable for the purpose of getting away storm water readily. But I think it more important to make use of the space available than to consider the ventilation of these particular machinery rooms. The adjoining building is very near the boundary, and there is danger of fire from the eypress hedge, but that has been provided against by taking up parapet walls on that side of the building. The ceilings for this building are graded in concrete, covered with bituminous felt. Therefore, both parapets and ceilings make the machinery rooms as fireproof as it is possible to make them. There are no openings in the wall on the side of the building. There is an 8-ft. entrance to the luncheon room on the north side from Congdon-street. I think it is advisable to put wire-lined glass windows in the luncheon room, but I do not think it is necessary to put them anywhere else. In the Cottesloe district, within the last few months, there has been inaugurated a system of septic tanks for individual houses. It is obligatory for householders to provide them. The estimate of this building provides £150 for a water closet with septic tank. It is possible that the Municipal Council may be installing septic tanks at a cost of £14 each. They may be able to do something in the nature of mass production, and we shall make some inquiry into their system. The extra cost of tiling compared with galvanized iron is £188. Nothing further can be included in the design to make the building more fire-proof. A sprinkler system would certainly do so, but it is

unnecessary in this type of building. I doubt the possibility of fire getting into it from any outside source.

21. To Mr. Cameron.—The flooring in the Cottesloe exchange will be jarrah boarding, out of inch stuff. I should think that a building carried out by a private architect could not cost any less than this. For domestic buildings costing up to about £1,500 it is quite likely that my plans and specifications could be beaten by an outside architect. I have built two houses. One I did on more or less rough and ready lines. Although it was probably the best house in the street, it was not designed as fully as it would be in my office, nor were the specifications anything like as full. The next house I built when I had to leave Melbourne to come to Western Australia, and in order to make sure I made full specifications and very full plans. Although I know that by doing so I would probably put up the price against myself, I considered it worth while. I do not think that the Cottesloe exchange will have stronger and heavier foundations than a private building of a similar nature carrying similar walls. Any building that very materially differed from the foundations we provide would be in trouble. We are not putting in more strength than is necessary. We are guided in our foundations by the class of country in which we are building, and by the weight of walls. I do not think that a vacuum or compressed air cleansing plant would be sufficient in this climate for air conditioning purposes. Investigation has not been made locally as to whether it is necessary to have a large air conditioning plant in the Cottesloe exchange. It is apparent that there is some doubt in the minds of either my head office or the Postmaster-General's Department, as to whether a complete air conditioning plant should be installed immediately at Cottesloe.

22. To Senator Reid.—I do not know of any purpose to which the air conditioning plant room could be devoted, other than for an air conditioning plant. If the plant were dispensed with, I think the room would be unnecessary. It is essential to run a parapet wall on the side of the exchange adjacent to the next block. Otherwise, we should be in trouble with our roof water running on to the next man's property. The rainfall in Perth is about 36 inches a year, but it is the amount of water that falls in ten minutes that does the damage. On the blank wall side of the exchange we have four down pipes draining a surface of 58 feet by 27½ feet. The pipes go down inside the building. The parapet, which will be 18 inches above the roof, should afford sufficient fire protection. There is a flat roof over the machinery rooms. No access is to be given to the roof. In North Melbourne a portion of the air conditioning plant has been put on the roof. The condensing plant has been put up there, and I should not be surprised if they did the same at Cottesloe. The flat roof gives protection against fire, and also serves as a ceiling for the machinery rooms. I prefer a flat roof of concrete to one of timber. Over the battery and power plant rooms a concrete roof with bitumen on top is superior to a pitched roof with an ordinary ceiling under it. There is very little to choose between the prices of the two methods by the time provision has been made for the flashing of a tiled roof. The method of ceiling adopted in the new exchange allows for placing windows on the northern wall of the switch room above the level of the flat roof. It is very rare that we have ceilings in concrete, but having them, it is a simple matter to project the concrete cornice over the concrete cornice. We are providing concrete cornices in this building because the local regulations demand that if your roof overhangs a public street you must make the soffit of the eaves of some non-combustible

material. The local authorities have in mind the prevention of fire from adjoining buildings. It is a wise provision. Some cities permit ordinary wooden eaves, provided you keep all woodwork 4 feet from adjoining buildings, but within the last 18 months a fire in Perth showed the vulnerability of the eaves of a building to a very marked degree. Two well-built buildings were destroyed by fire. One of them was of concrete, and it was destroyed because the eaves were not protected. Any money expended in the way of protecting the eaves in crowded streets or in streets likely to become crowded in the future is well spent. The local regulations insist that there should be protection against the possibility of tiles or any other loose material on a roof falling on people's heads. The method we have adopted will, I think, provide against that possibility. Our walls will be brick to within 12 inches of the ceiling line. The wall plate is stood on the extended concrete ceiling. The ends of the rafters are protected from the outside by a galvanized iron gutter, which turns up at the back of them, and under the tiles. All timber in the roofing is covered up. The walls will be 11 inches thick above the floor line, and 16 inches below the plinth course. The walls of the cable well will be 18 inches thick. The 11-in. wall is strengthened by 16-in. piers. It will be a cavity wall up to the continuous concrete plinth, which is solid. I do not know that tiles are dearer in Perth than they are in Melbourne, but the local people prefer to give a price for the laying of the roof, and they give a guarantee for 12 months. There is only one firm making tiles at present in Perth, but there is nothing but the limited demand to stop anyone else from making them. As a matter of fact, the use of tiles is now here. Galvanized iron roofs have lasted much longer in Perth than in Sydney and Melbourne. Even at Cottesloe, quite close to the sea, there are quite a number of galvanized iron roofs still going up. I should not be at all surprised if galvanized iron roofs lasted 60 or 70 years, if a suitable paint is employed. Such roofs at Fremantle or Cottesloe would require painting very much oftener than in Perth. Sea air limits the life of iron. I think we get value for the money we pay for tiles. I do not think that a delay in calling for tenders for this building would bring about a lower price. If the job were approved of immediately, I should have to allow a greater length of time for the completion of the work than I would if it were three months before approval came through. I should need to ascertain from the Postal Department what provision, if any, they would want to make for the doors being left out while they were getting in their machinery. I do not think that there is any likelihood of a security system being established in Cottesloe in the immediate future. If there were any such likelihood, I do not think they would have gone on with the installation of septic tanks for each house.

23. *To Mr. Cook.*—Tenders will be invited for the work of building the exchange. The shortage of bricks is not due to the action of a combine among the brickmakers. The bulk of the bricks for buildings requiring structural stability are supplied by the State brickworks. There are private brickmakers, but they do not seem able to supplement the State output sufficiently to meet the present demand. On the other hand the State brickworks have apparently not foreseen the demand, or, if they have done so, have not been able to get their machinery quickly enough. Repairs to kilns have limited the supply, and the position during the past 6 months has been distinctly harassing to contractors. They have been unable to get a sufficient quantity of bricks when they needed them, and all construction work has been more or less delayed. The State brickworks are hopeful of overtaking the

shortage now that their transformer plant has reached Perth, and it is probable that within 2 or 3 months there may be a marked improvement. My last knowledge of Melbourne brick prices was that they are about the same at the kiln as they are at Adelaide here. But the West Australian brickworks are further out from Perth than the Melbourne brickworks are from the city of Melbourne. In the circumstances the prime cost of Melbourne bricks is somewhat less than that of Perth bricks. I think that it must cost less to lay bricks in Perth than it does in Melbourne, because completed brickwork is a little cheaper in Perth than it is in Melbourne. Whether it is due to the Perth men laying more bricks per day or to the contractors reducing their profits, I do not know. The price of cement is 40/6 a ton in Perth. I do not know that it costs 24/6 a ton in country towns in Victoria. I shall look into the matter. It is not necessary to have a basement in the exchange at Cottesloe. The building is not designed to carry another story if development requires it. If extension in the future is contemplated, the building will be extended to the rear.

24. *To Senator Barnes.*—No consideration has been given by me to the idea of having a flat concrete roof for the whole of the building. The plan was designed in Melbourne and was sent to me containing two alternatives, a tiled roof or a galvanized iron roof with a parapet. I think that a flat roof over the whole building would be cheaper, seeing that we are already providing for a concrete ceiling, and I think it would also afford more protection from fire. Moreover, the tiled roof is a surer safeguard against dampness.

25. *To Mr. McGrath.*—When approval is given for the creation of the building, we shall call for tenders. In the event of the prices submitted being very much higher than my estimate, I would report the matter to the Director-General of Works, and I should advise one of three things: The acceptance of the lowest tender; the calling of fresh tenders; or, the carrying out of the work at my own estimated cost. In Western Australia tendering for buildings of this type is fairly close. There is any amount of competition in the metropolitan area. It is not the same in the country districts. On one occasion I did not consider the tendering legitimate, and I reported to that effect to the Minister. I advised him that I did not think we could get any better tenders, and that I was prepared to back up my own estimate and do the work by day labour with my own staff. Eventually I did the work for an expenditure which was considerably lower than the lowest tendered price. The work was in a very remote country district. In my opinion the contractors were not keen to undertake work in the locality. I think that the bricks manufactured by the State are better than those manufactured by private concerns. There is very little to choose between the prices, although I believe that at the present time the State bricks are 1s. or perhaps 2s. lower than bricks made at private brickworks. At any rate I prefer the State bricks. I do not know of any particular case in which a contractor has done his own thing. I doubt if any contractor could beat 24/6 a square as charged by the tiling company. I prefer the West Australian system.

26. *To Mr. Lacey.*—There is ample room for expansion at the rear of the Cottesloe exchange. I think it is quite conceivable that if the block had been wider we might have made the switch room wider, taking something off the length, but otherwise I do not think there would be any advantage in having a wider block of land. The price of tiles in Melbourne was 23/10s. 6 square when I was there two and a half years ago. But I think we got 24/6 worth of value in Perth as compared with that 23/10s. 6d. in Melbourne. With our severe winter rains in Perth, we know within twelve months whether the tiling is effective or not.

27. *To Mr. Cook.*—R. O. Law is the principal brick manufacturer here. There are smaller works making wire-cut, and even hand-made bricks, but I do not know that they are working continuously. I do not know if the private firms have as up-to-date machinery as the State brickworks, but I do know that the bricks they turn out are slightly inferior to the State bricks. I would welcome any one who would help us out of the present shortage.

28. *To The Chairman.*—The foundations will be of concrete twelve inches deep and two feet six inches wide. The sand gives a satisfactory foundation. I anticipate no trouble with the drainage. We have taken every precaution on the blank wall to cope with an extraordinary heavy flow of water. The concrete roof would be graded three inches high at one side.

(Taken at Perth.)

FRIDAY, 9TH SEPTEMBER, 1927.

Present:

Mr. MACKAY, Chairman;	
Senator Barnes	Mr. Cook
Senator Reid	Mr. Lacey
Mr. Cameron	Mr. McGrath.

Sidney Laurence Mounslau, Superintendent of Telephones, Western Australia, sworn and examined.

29. *To The Chairman.*—I was appointed to my present position in June, 1926, but I did not occupy it until February, 1927. The service rendered at the Cottesloe manual exchange is reasonably satisfactory, having regard to the type of switchboard in use. It is a magneto system, which does not give that satisfactory service which can be obtained from a modern equipment, such as an automatic exchange. The Cottesloe equipment is maintained in a good condition and is standing up as well as the equipment in other magneto exchanges such as Midland Junction and Guildford. All these exchanges are of the same type, but their equipment requires more maintenance than does the automatic exchange. That is due to the wearing of the plugs and cords, which is greater than the wearing of the apparatus in an automatic exchange. In a manual exchange the life of the plugs is very short, and the cords break at times, with consequent cut-offs. Cottesloe exchange being in use to a greater extent than other exchanges, is not in as good a condition as the other exchanges of the same type. While we are providing a reasonably satisfactory service with a manual exchange, it is not deemed desirable to incur additional expense by replacing it until we get the full use of the life of the equipment. We can say to-day that we have had good use of the equipment at Cottesloe, and we are now asking for the installation of automatic equipment, because we shall use it two years' time. We can carry on in the meantime, but if the new exchange is not authorized, it will not be humane to ask the telephonists to work additional equipment in the manual switchboard room at Cottesloe. At the other exchanges we are in a very fortunate position. Our building capacity at Perth is 7,600 lines. At the moment we have provision for 6,300 lines. The present Cottesloe building will carry 1,500. We now have 1,300 installed. The Fremantle building will carry 1,600 lines; we have 1,400 subscribers connected. At Guildford we have building provision for 600 lines, whereas only 256 lines are connected with the exchange. There is provision at Midland Junction for 1,000 subscribers; the total number of lines connected with the exchange is only 197. At South Perth provision is made for 600 subscribers; the number

now connected is 400. At Cannington we have provision for 400 subscribers, but there are only 71 lines in the exchange. Thus we are in a good position at the other manual exchanges for the time being. From an economic standpoint it is necessary to get the benefit of the expenditure already incurred in providing equipment. We do not propose to ask for an alteration to the automatic system where the existing equipment is giving a reasonably satisfactory service. But the position at Cottesloe is pressing. The engineers are doing very good work in the maintenance of the equipment in the exchange, but they are keeping it going under extreme difficulties. Very little is being done to it. Money will have to be spent on it until the automatic system is installed, but we say that we cannot do it after two years, and still give the people a service. If we remain where we are and do not have an automatic exchange at Cottesloe, the present building will have to be extended in some way. From a traffic point of view, I consider that the installation of an automatic exchange at Cottesloe is absolutely warranted. The calling rate fluctuates between 3.48 per day in winter to 5.1 per day in summer. The Perth calling rate fluctuates from 6.0 per day in winter to approximately 9 per day in the winter. I am satisfied that our method of estimating an increase in the number of subscribers is sound. It is a method which is adopted all over the world. I think our estimate is on the conservative side. The officer does not arrive at it by guesswork. It is the result of a detailed study he has made of the district. He sees the buildings already in position, and notes the class of house, and the allotments which are available for future buildings. Afterwards he talks with town clerks, estate agents, and prominent business people, and with railway and tramway authorities, who all have to estimate for the future. It is, of course, largely a matter of personal judgement, but it is not left to one officer. When the survey officer turns his work in to the engineer, the latter checks it up, and the estimate framed is subject to discussion between the engineer and the survey officer. Every effort is made to check the information to have it as accurate as possible. The department is now canvassing for subscribers. So far, results have been satisfactory. We are doing very well in the Perth area. We combined Fremantle and obtained 50 or 60 additional subscribers. The response was not so great at Midland Junction, because there are only a few business people there, and the residents of the district are not of the affluent class. We are doing rather well in districts like Mount Lawley, and others adjacent to the city. I think that the rentals charged by the department are such as to encourage the average householder to have a telephone. We are now accepting the rent for six months instead of twelve months in advance. A telephone is almost an insurance in a house. It provides means of getting medical assistance, it is an insurance against burglary, and it increases the working capacity of the individual. Generally speaking, it is an adjunct to social life that every family should have. The rent outside the metropolitan area is £3 a year. At Cottesloe it is £5 for the first two miles, measured radially from the exchange, and 10s. extra for each additional quarter of a mile from the exchange. The longest line from the Cottesloe exchange is 3 miles 72 chains. Some of the subscribers pay a rent of £9 a year. It is a heavy charge for the average householder, but it is really a matter of business. It is only reasonable that the Postal Department should get a return on its capital expenditure in providing a line for a distant subscriber. As a matter of fact, the return is not adequate in all cases. If a man lives a fair distance from an exchange, it follows that he is not in the centre of population. His capital expenditure involved in

living at that particular part is less than that of a man living close by the exchange. Reductions of rentals will come with an increase of population. As the population grows there is no doubt that exchanges will be established at other points. For instance, the department is now considering the advisability of building automatic telephone exchanges at Victoria Park and Maylands. It is obvious that in time to come there must be an automatic exchange at Nedlands, and a satellite exchange between Cottesloe and Fremantle. It will be cheaper to adopt that method and, at the same time, give the public the benefit of smaller rentals. Instead of building large exchanges, I see nothing to prevent the erection of small buildings with equipment that is practically unattended. We were considering the establishment of such equipment at Springvale, in Victoria. Sandringham was an unattended exchange at first. It took about 400 subscribers off the Brighton exchange, and it worked for years without having a mechanic in attendance. There are many systems of letting the mechanics in the main exchange know when anything has gone wrong in the satellite exchange. For instance, the use of lamps enabled the mechanics in the Brighton exchange to know when a fault had occurred in the Sandringham exchange. Nedlands is on the extreme edge of the Cottesloe telephone area. The North-east exchange runs lines two miles out to Preston. From Onk-leigh lines are run out towards Dandenong. As population grows we shall establish a satellite exchange at Springvale, and one between Canterbury and Box Hill. It is all a question of the growth of population. The Mount Park Soldiers' Home is connected with Heidelberg, a considerable distance away. It is the capital cost of the undergrounding and the maintenance of the lines that you have to consider. The telephone service in Australia is next to the Swedish system, the cheapest in the world. We are so far situated from the place of manufacture that we cannot always get the material we require, and I think that the Australian government has done exceptionally well in providing telephone facilities in metropolitan and country districts. The conversion of the whole of the manual exchanges to automatics would not reduce the rentals. The telephone system as a whole is run at a loss, because we are providing facilities to break down isolation in country districts. There is a certain amount of difficulty in securing automatic equipment. We do not know which company will supply it. My experience in Melbourne shows that it takes from four to six months to install automatic equipment in an exchange and test it properly. I am sure that the establishment of an automatic exchange at Cottesloe will be a financial success. The people will be provided with a quicker service. On an automatic exchange a subscriber can get his next number within two seconds of clearing the previous connection.

30. *To Senator Reid*—Cottesloe is the oldest manual exchange in the Perth metropolitan area. The service it gives is fairly satisfactory, but I think the district requires something better. Telephone rentals are uniform throughout the Commonwealth, but the country rates are lower than the city. I regret to say that the department is making a loss on country lines, but you cannot estimate the value derived by country people through having a telephone service. It cannot be regarded from the viewpoint of pounds, shillings and pence. It has to be considered from the aspect of keeping people on the land, and making their lives bearable there, thus increasing primary production. That is the policy of the Postal Department. All I know is that we are not showing a profit. Last year I think we improved somewhat on previous years, but we are now getting almost as many subscribers in the country as in the metropolitan area. For

instance, in Western Australia we have 9,000 subscribers in the metropolitan area and almost 9,000 in the country districts. There are 50,000 subscribers in the metropolitan area in Victoria, and an almost similar number in country areas.

31. *To Mr. McGrath*—Kalgoorlie is regarded as a country area. It is all country, ten miles from the G.P.O., Perth. The rate is based on the number of subscribers connected with country exchanges. The rental for an exchange of up to 300 subscribers is £3 per annum. For an exchange with from 300 to 600 subscribers, the annual rental is £3 6s. For an exchange with from 600 to 1,500 subscribers, the annual rental is £4 7s. 6d. For an exchange with from 1,500 to 4,000 subscribers, the annual rental is £4 12s. 6d. For exchanges with 4,000 subscribers and upwards, the annual rental is £5.

32. *To Mr. Cameron*—Our engineers have done good work at Cottesloe to maintain it, but only at extra cost. It is more economical to have 40 subscribers in one street than to have them scattered at various points. It is the lines and connections that cost the money.

33. *To the Chairman*—Undergrounding the wires is more expensive than putting them on poles. I think we can run up a good pole service at a cost of £150 a mile, whereas the undergrounding costs many hundreds of pounds a mile. Each pole will carry 64 wires. Aerial construction is decidedly the cheaper, particularly in this State where there is so much timber available.

(Taken at Melbourne.)

THURSDAY, 15TH SEPTEMBER, 1927.

Present:

Mr. MACRAE, Chairman;

Senator Barnes Mr. Cook
Senator Reid Mr. McGrath.
Mr. M. D. Cameron

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

34. *To the Chairman*—I am responsible for the designs of the proposed automatic telephone exchange at Cottesloe. I regard the work as urgent. Approval of the work was given by a former works committee in 1922. The then chief electrical engineer had just returned from America, and after consideration of certain data that he brought back, it was considered more economical to continue to use the manual equipment until a further study had been made. We have found it practicable to keep the manual equipment in operation until now, when the present room is full. It is necessary, now, to go ahead with the proposal for an automatic exchange. In the meanwhile, the proposal has varied in regard to the number of lines and the cost per line. In 1922, the cost per line was considerably higher than it is now. We have had to incur a certain amount of expenditure to keep the existing exchange going. The advantage is that we are obtaining our switching equipment at a much lower rate per line. The disadvantage has been that, in the meanwhile, subscribers have had the manual instead of the automatic service. They have, however, had a satisfactory service, and there has been no real need to introduce the automatic equipment until we were forced to do it. Considerable improvements have been made in automatic apparatus in the last few years. We propose to take advantage of the latest type of automatic equipment, which is now being manufactured in England, and which was then chiefly manufactured in America. The aim of manufacturers has been to make the traffic

units smaller, more compact, and less costly to maintain. They have, to a certain extent, done that within the last five years. There is a distinct difference between the equipment we are obtaining now and that which we would have obtained in 1922. The estimate of development made in 1922 has been borne out. Owing to the delay, the present proposal is in many respects different from the original one. I do not think that the statement is correct that plant was purchased for this exchange and afterwards diverted to the eastern States. When we purchase equipment it is not necessarily intended for any particular exchange. If we purchased equipment, part of which had been taken into account for a new exchange, we could, of course, divert it to an existing exchange. There is that flexibility about automatic apparatus which does not exist with manual apparatus. I submit the following statement for the information of the committee:

PROPOSAL FOR ESTABLISHING AN AUTOMATIC EXCHANGE AT COTTESLOE, WESTERN AUSTRALIA.

The proposal is to erect a building on a site already acquired at the corner of Clive-road, Congdon-street, and (Marmont-avenue, Cottesloe, and install therein an automatic telephone switching system having an initial equipment for 1,700 subscribers' lines, and an ultimate capacity of approximately 4,400 subscribers' lines. It is proposed that the initial equipment shall be capable of extension to the ultimate capacity named, and thus enable requirements in the proposed automatic exchange area to be met for twenty years after the proposed date of opening.

REASONS FOR THE PROPOSAL.

The existing manual magnetophone exchange will not give satisfactory service beyond 1929, and owing to building limitations cannot be extended in the existing building. It will not be economical to utilize the existing site, owing to its distance from the telephone centre of the area. It is proposed, therefore, to install modern plant in a new building on a new site in order to give efficient service to the existing and prospective subscribers in the area.

ESTIMATED COST.

The estimated immediate cost of the work is—

Site (already acquired)	£120
Building	4,750
Air-conditioning plant	2,680
Exchange equipment (including that necessary at other exchanges)	34,391
Sub-station equipment	6,000
Line plant (diversion)	400
Sundries	250
	<hr/> £49,101

ACTUAL AND ESTIMATED REVENUE.

The actual revenue for the year ended 31st March, 1927, and the annual revenue, it is estimated, will be obtained on the date of opening and five years, thereafter, is shown hereunder—

Average number of Subscribers' Lines connected during the year ended 31st March, 1927.	Actual Total Revenue received for year ended 31st March, 1927.	Estimated number of Subscribers' Lines, 1st Jan. 1929.	Estimated Annual Revenue, 1st Jan. 1929.	Estimated number of Subscribers' Lines, (five-year date).	Estimated Annual Revenue, 1st Jan. 1935.
1,164	£12,670	1,500	£16,125	2,000	£21,500

SITE.

The proposed site is situated at the corner of Clive-road, Congdon-street, and Claremont-avenue, Cottesloe. Its dimensions are approximately 58 feet by 108 feet, and it is located approximately at the telephone centre of the proposed automatic-exchange area.

BUILDINGS.

It is proposed that the building shall be of simple design, and built on the latest fire-resisting principles. The immediate installation in the exchange is for an equipment of 1,700 subscribers' lines, but the building will be designed to accommodate equipment having a capacity of approximately 4,400 lines.

FINANCIAL ASPECT.

Item.	As at 1st Jan., 1930.	As at 1st Jan., 1935.
1. Capital cost—new	£	72,208
2. Capital cost—new and in situ	46,433	110,510
3. Annual working expenses of proposed automatic exchange	6,727	0,663
4. Total annual charges for proposed automatic exchange	14,981	18,010
5. Annual revenue— Actual for year ended 31st March, 1927, £12,670 Estimated as at 1st January, 1930	12,670	16,125
Estimated as at 1st January, 1935		21,500
6. Assets recoverable or thrown spare if an automatic exchange is established on new site on 1st January, 1930— (i) Book value	11,107	—
(ii) Recoverable value	5,558	—
(iii) Cost of recovery	318	—

Regarding item 6 of the foregoing statement, the difference between sub-items (i) and (ii), namely, £5,509, 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.

The figures are prepared in my office from data received from the State Engineer and the Deputy Director at Perth. The committee would be reasonably justified in expecting my figures and those supplied at Perth to agree. We may, however, have used later data than they had in their possession when the committee was there. The reason for the variation in the figure relating to the air-conditioning plant is explained by the fact that we received from the Works and Railways Department a variation of their estimate. In any period of several months there might reasonably be a variation of £180, such as occurs in this item. Other variations in the figures are all consequential on this alteration. When we are preparing our proposal in the first instance we ask the Works and Railways Department for their figure, and they give us as close a figure as they can at that time. Before we present the evidence to the committee, we ask the department for a closer approximation to the cost, and revise our figures accordingly. It is their estimate of the cost, not ours, that has varied. The figure supplied to Mr. Kilpatrick was based on the earlier estimate by the Works and Railways Department. If evidence had been taken from me first, and from officials at Perth afterwards, I should have advised them of the latest data. The population in the area to be served at the 30th June last was 26,610. The number of lines in the existing manual exchange is 1,248, and of stations 1,368. There were fifteen waiting applications on the 31st July. The proportionate value of the existing site is £190. We take the proportionate value because there is a post-office on the site. The existing exchange was opened on the 1st July, 1928. The ratio of automatic to the total number of exchange lines in the metropolitan area of Perth is 63.7 per cent. For the whole State it is 32.8 per cent. The reason for the relatively high proportion in the metropolitan area is that the main exchange in Perth is automatic, while the main exchanges in the other big networks are not automatic, although they shortly will be. The present apparatus at Cottesloe has outlived its life. Some of it has been in use since the exchange was built, but some of the switchboards have been added only during the last two or three years. There are several unattended exchanges in Australia, but they are quite small ones. We do not have an attendant at an exchange if we can do without one. At many exchanges we have no attendant between Saturday afternoon and Monday morning. That statement applies to even fairly large exchanges, such

as Cottesloe. Complaints made as to cost by subscribers apply to areas which are much too big for what we call community exchanges. We have no exchange for a long distance east of Fremantle. If development occurs in that direction, subscribers situated more than a certain distance from the exchange have to pay an extra ground rental. We are establishing additional exchanges shortly in Perth. One will be at South Perth, and another at Maylands. All subscribers within a radius of 2 miles of those exchanges will be relieved of the extra rentals now charged them. It does not pay in a metropolitan area to establish a large number of small exchanges, nor is it good for the community. We could not staff small exchanges continuously, and in that event subscribers would have a service only between 9 a.m. and 6 p.m. It is better to charge them an extra £2 a year and connect them to an exchange where there is a continuous service. I have seen the site at Cottesloe. I am satisfied that it is suitable for the purpose, and large enough to meet probable telephone development. We use wired glass in all automatic exchanges, and the risk of fire is very small. The building will be of concrete, and in the event of a conflagration the fire brigade would have little difficulty in handling the situation. Where it is considered necessary for fire protection purposes we build a dividing wall. We did that at South Brisbane, where we considered that the risk was great. Telephone charges are uniform in the different States, and any concession given to one State is given to all. There is a difference between the charges made in metropolitan and country districts. Our metropolitan network is 10 miles radially from the central exchange. We depart from that on special occasions. We are taking the precaution of providing space for an air-conditioning plant, but will not install the plant until it is found to be necessary. The reduction in the cost of the equipment since 1925 is due to a fall in prices, not to any reduction in the efficiency of the plant.

35. *To Mr. Cook.*—We never have a basement in an automatic exchange. All we have is a cable trench for the purpose of leading in the cables. The cost of filling in the site has, no doubt, been taken into account in the Works and Railways estimate.

36. *To Mr. M. D. Cameron.*—We purchase the bulk of our telephone requirements in England. In this case it will amount to about 90 per cent. of the whole. If America put in a very low price it might obtain the order. We give a certain preference to British manufacturers, and that preference might govern whether the order goes to England or America. Great Britain is always given preference over America, other things being equal. Certain of the switchboards in the present exchange will have to be broken up, but the more recent ones will be removed to other exchanges. The recoverable value is the value of the equipment usable in other exchanges.

37. *To Senator Reid.*—The telephone undertaking is, I think, paying in all the big cities, but not in the country districts.

38. *To Mr. McGrath.*—The reason why the telephones do not pay in the country districts is partly because of the ministerial policy of providing cheap telephone service for the country.

39. *To Senator Reid.*—We have to carry out ministerial policy, and we cannot charge more than we are allowed to charge. Cheap telephones for the country have advantages from the point of view of national development. If country subscribers were charged the same as city subscribers the system would pay all round, but, on the other hand, if country subscribers were charged the whole cost of telephone development, country development might be retarded. The rates are based on the capital cost and the annual charges. I cannot say how long it will be before I shall have

definite information about the air-conditioning plant. It will be a matter of experience over a number of years. It is possible that at Cottesloe, which is close to the ocean, the plant will be needed earlier than elsewhere, and at some places in South Australia, where the humidity of the atmosphere is not great, it may not be needed at all. The additional cost of providing in the building for the future installation of the plant is comparatively microscopic. It is best to assume that the plant will be needed.

(Taken at Melbourne.)

FRIDAY, 23RD SEPTEMBER 1927.

Present:

Mr. MACKAY, Chairman;

Senator Barnes	Mr. Cook
Senator Payne	Mr. McGrath
Senator Reid	Mr. Seabrook
Mr. M. D. Cameron	

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

39A. *To the Chairman.*—I am responsible for the plans submitted to the committee for the Cottesloe exchange. The design shows alternatively an iron roof and a tile roof. One idea was to have a parapet wall with a more or less concealed iron roof, and the other was to allow the eaves to be seen, and to have a tile-covered roof. It was left to the committee to decide after inspection, which design would harmonize better with the surroundings. I had an idea, from general knowledge of Cottesloe, that the site might be an important one from the stand-point of appearance, and I was hopeful that the committee would favour the tile roof. The utility of the building is not affected by either roof. The tile roof will probably cost £200 more. The suggested extension of the concrete ceiling would be quite satisfactory, but a little more expensive than having wooden eaves. The figures submitted to the committee by Major Cook are reliable. The estimate of £4,750 was supplied to the post office by us some time ago; and after full details had been prepared, the figure remained unaltered. I recommend that that estimate be accepted by the committee. All the post office calculations have been based on it. Although we say that a tile roof building will cost £200 more, we may receive a tender for a tile roof building at £4,750. Ample provision is made for dealing with storm-water. Major Cook, after giving evidence before the committee, wrote to me to say that he had told the committee that if the air-conditioning plant was not used £250 could be saved. That, however, is impossible. The room is required.

40. *To Mr. Seabrook.*—All plans for telephone exchanges are similar. They vary only in size and according to the physical condition of the site. The advantage of the tile roof lies only in the matter of appearance.

41. *To Mr. Cook.*—We ought not to outrage the locality by constructing a building that is not in harmony with its surroundings. Building costs are slightly lower in Western Australia than in Melbourne. We get very good competition there. That State is developing rapidly, and there will be a lot of work there during the next two or three years.

42. *To Senator Payne.*—From the utility point of view I should place tiles and iron level. The tiles would be manufactured in Western Australia. They are of a good quality. The additional cost of £200 for tiles takes into account the additional cost of heavier roof

framing. Either roof with an average amount of attention would last as long as the other. Tiles are sometimes damaged in districts where there are heavy hail-storms.

43. *To Senator Reid.*—The idea of having concrete eaves is good. We have used them before.

44. *To Senator Payne.*—I am not aware that we have used glazed tiles. If they were used we could employ

slightly lighter timber. Aesthetically, I prefer the ordinary tile. Cement tiles are quite good. The different tile companies keep their prices fairly close to one another. For some reason cement tiles do not last well at Canberra. I have known tiles to fret away where they touch the battens, but I do not think that occurs with modern tiles. In such cases I have seen they were French tiles.