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THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

R E P O R T

relating to the proposal to extend the

HAWTHORN TELEPHONE EXCHANGE, VICTORIA.

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

EXTENSION OF HAWTHORN TELEPHONE EXCHANGE, VICTORIA

R E P O R T

By resolution on 1 May 1968, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for investigation and report, the proposal to extend the Hawthorn Telephone Exchange, Victoria.

The Committee have the honour to report as follows:

THE COMMITTEE'S INVESTIGATION

1. The Committee received submissions and drawings from the Postmaster-General's Department and the Department of Works. Evidence was taken at a public hearing in Canberra from representatives of these departments. We inspected the site of the proposed extension and the facilities in the existing exchange building.

THE REFERENCE

2. The proposal referred to the Committee is to erect a building with a basement and six upper floors as an extension at the rear of the two-storey Hawthorn Telephone Exchange at 375-383 Burwood Road, Hawthorn. The building is to be structurally capable of taking three additional floors in the future, as a later stage of construction.

3. The proposed accommodation is for subscribers exchange equipment for the Hawthorn local exchange area, tandem exchange equipment for the eastern segment of the Melbourne telephone zone network and automatic

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trunk switching equipment and carrier transmission apparatus associated with subscriber trunk dialling facilities.

4. The extension is designed to meet space requirements at the exchange until about 1985. By then, the three further floors will be required for equipment replacing that in the present building. When the new equipment is in use, it is planned to replace the present structure with a multi-storey building designed for the requirements of the post 20-year period.

THE SITE

5. The site has a frontage of 72 ft to Burwood Road, Hawthorn, widening to about 80 ft at the rear boundary. The depth is 215 ft. The area was acquired in 1928 to provide for exchange development from the existing exchange, then located in the nearby Hawthorn Post Office.

6. The present development was initiated in 1938 when a two-storey exchange building was erected on the southern part of the site. This was extended in 1959. The unused portion of the site at the rear is now about 80 ft square.

7. The site is at the practical cable centre of the area it serves. It is also on the main duct route serving the eastern metropolitan and sub-metropolitan areas. The duct route is also used by large trunk cables which link Surrey Hills, a major radio terminal, to the city trunk centre. The Hawthorn Exchange is thus well placed for local subscriber and trunk switching purposes and for the termination and repeating of trunk channels.

FUNCTIONS AND FACILITIES OF HAWTHORN EXCHANGE

8. The Hawthorn Exchange was established in 1911 in the Post Office building and served a large semi-rural area. By 1939, 7,500 subscribers were connected to the manual exchange. An automatic exchange was put over at this time in the front portion of the present exchange building and some Hawthorn subscribers were transferred from the manual exchange. At that stage, Hawthorn was the main automatic exchange in the eastern sector of the Melbourne network.

9. Between 1948 and 1958, the Hawthorn local subscribers area was reduced because of the establishment of three new exchanges and by the end of the period, 3,700 subscribers were connected to the Hawthorn Exchange. All were served by automatic equipment, the manual exchange having been eliminated.

10. The step-by-step network for the Melbourne Extended Local Service Area (ELSA) is served by 11 through switching exchanges and one of these is established at Hawthorn. It serves subscribers whose numbers begin with 8.

11. The exchange building was extended in 1959 to enable the main exchange element to keep pace with development taking place in the eastern suburbs. At that stage and since, the through switching for step-by-step equipment has dominated space requirements at the exchange.

12. The crossbar network for the Melbourne zone is served by four tandem exchanges which provide through switching for calls from subscribers whose local exchange has crossbar equipment. In 1964, Hawthorn became the crossbar tandem switching centre for exchanges in the eastern sector of the Melbourne

telephone zone. The principal growth in the area recently has been in crossbar equipment and the main exchange equipment for step-by-step switching has been held at its present capacity.

13. At present the main connecting point between the national trunk network and the Melbourne metropolitan network is City West Exchange. When the Lonsdale Exchange building, now under construction, is operating it will become the focal point for trunk traffic for Melbourne and nearby country centres. Lonsdale will house the first permanent crossbar trunk switching exchange in Melbourne and the trunk amplifying and carrier equipment to serve this exchange will also be located at the new trunk switching centre. In recent years, there has been a rapid increase in the use of trunk facilities and it has been predicted that this traffic will grow at the rate of 15% per annum at least for the next three years. Because of this, it will be necessary to provide relief for the Lonsdale automatic trunk exchange by establishing two additional automatic trunk exchanges in the Melbourne network. It is planned that the first of these to be in the Hawthorn Exchange, will be required for cut over about 1973.

GROWTH IN TELEPHONE SUBSCRIBERS

14. The Hawthorn local subscribers exchange area is now a comparatively small one of about 1,600 acres. As the area is one of the older parts of Melbourne and is fully built-up, the redevelopment of some of the older and more depressed parts with flat projects is being considered. This factor is expected to contribute to the telephone growth of the area. After the completion of the work in this reference, subscribers in the Hawthorn local exchange area are expected to increase from 6,250 at present to 6,700 in 1970, 7,800 in 1975, 9,100 in 1980 and 12,200 in 1990.

15. The growth pattern of the other elements of the Hawthorn Exchange complex, such as tandem and automatic trunk switching is more closely governed by the development of both the inner and outer metropolitan areas, particularly the eastern segment of the Melbourne telephone zone. Melbourne has experienced rapid growth over the past 10 years and much of this has occurred in the eastern and south-eastern suburbs. Growth has been principally in the form of medium and high class residential development on land previously used for rural purposes. The Committee were told that there is a high demand for telephone services in this type of community.

16. We noted that post office planning is currently based on a subscriber development of the following order:

	<u>Subscribers in the Hawthorn tandem area</u>	<u>Subscribers in the Melbourne telephone zone</u>	<u>Population of Melbourne ELSA area</u>
1967	100,000	460,000	2,285,000
1970	118,000	540,000	2,460,000
1975	155,000	670,000	2,776,000
1980	194,000	800,000	3,130,000
1985	230,000	930,000	3,495,000
1990	260,000	1,100,000	3,880,000

17. The Committee's Conclusions These facts and figures demonstrate, we believe, that a need is developing for additional telecommunications facilities in the Hawthorn area to meet the demands of future growth.

18. We found that it would be appropriate to provide these facilities in an extension of the Hawthorn Telephone Exchange.

FUTURE DEVELOPMENT OF FACILITIES

19. Subscribers Local Exchange Equipment The Hawthorn local subscribers exchange has equipment for 6,250 subscribers. By the time the local exchange extension is in service in the proposed building, equipment in the existing building will be available for 7,000 subscribers. The initial installation of 600 lines in the extension is expected to meet development for about two years. Ultimately, the crossbar equipment to be installed in the extension will service some 6,500 subscribers.

20. Tandem Exchange Equipment A large part of the present space is occupied by the step-by-step main exchange and new development is being met by a crossbar tandem exchange. The combination of these exchanges will handle the junction traffic for the Hawthorn tandem area until additional tandem equipment is available in the proposed extension about 1971.

21. The need for more tandem equipment space after that time will occur about 1985. It is proposed to provide this in the floors to be added to the building.

22. Automatic Trunk Exchange Equipment The Hawthorn Exchange is planned to be the second of three automatic trunk exchanges required in Melbourne to handle subscriber dialled trunk traffic. Lonsdale Exchange is to have 12,000 terminations and Hawthorn 8,000. Together they will cater for the needs of Melbourne until about 1981.

23. The initial installation at the Hawthorn automatic trunk exchange is to have a capacity of 4,000 terminations. This should meet needs for about four years when the remaining 4,000 terminations will be installed. It is not proposed to extend the Hawthorn automatic trunk exchange beyond this point.

24. Trunk Amplifying and Carrier Equipment Repeaters for 12 channel systems between City West Exchange and eastern outer metropolitan centres and repeaters for the co-axial cables between Surrey Hills and the main city trunk centre are now located in the Hawthorn Exchange.

25. It is expected in the future that greater use will be made of carrier equipment and co-axial cable for short distance junction circuits between metropolitan tandem exchanges. Allowance is therefore being made in the proposed extension for this equipment to be used in conjunction with the Hawthorn crossbar tandem.

26. The national complex of automatic trunk switching exchanges will be interconnected by trunk carrier channels for which the terminating equipment will generally be located adjacent to the trunk switching exchange. Space is therefore being provided in the proposed extension for this type of carrier equipment. It is expected that the number of carrier channels required at the Hawthorn Exchange will increase from 300 in 1970 to over 7,000 in 1990.

OCCUPATION OF THE PROPOSED EXTENSION

27. It is proposed that space in the proposed extension will be occupied in the following way:

Basement:

The need to extend the existing cable chamber at this level dictates the need for a basement in the proposed building, particularly as the new cable chamber must be wide enough to allow cabling to twin main distributing frames on the ground floor and to take the cables required when the site is fully

developed. As vehicle parking on the ground floor is essential, heavy load equipment such as emergency generators and transformers will be located in the basement. Air treatment plant and a pump room will also be at this level.

Ground Floor:

Staff access to the extension will be through the existing building from a new entrance to be provided off Burwood Road. After providing for the parking of 12 official vehicles and unloading and unpacking areas, the remaining space will accommodate twin main distributing frames. Vehicular access will be by a driveway from Burwood Road. Because of the restricted access, an electrically operated turntable is to be provided on the ground floor so that vehicles need not be reversed into Burwood Road.

First Floor:

Tandem exchange equipment, maintenance control and a supervising technician's office will be located here. The floor's power and battery room will service equipment on both this and the level above.

Second Floor:

Local subscribers exchange crossbar equipment will be at this level together with meters, maintenance control, a store and an office. The remaining area will be used for trunk amplifying and carrier equipment.

Third Floor:

Space on this floor, to be occupied ultimately by automatic trunk exchange equipment, will initially be used as office space. Some space will also be provided for automatic trunk installation, toilets, lockers and recreation.

Fourth Floor:

The initial installation of automatic trunk switching equipment will be made on this floor. A power and battery room, maintenance control, a store and an office will also be located here.

Fifth Floor:

Mechanical equipment associated with air treatment will be located on this floor.

Air treatment and emergency power for the existing building will be provided from plant in the proposed extension. This will permit the relocation in the existing building of the fault despatch and centralised testing section, now temporarily based at the South Yarra Exchange.

THE BUILDING PROPOSALS

28. Planning Considerations We noted that an important factor influencing the design was the requirement to construct the cable chamber as an extension of the cable chamber in the existing building. Equipment areas are being located on the western side of the building above the cable Chamber with the main distributing frames on the ground floor.

29. The floor to floor height of 15 ft 9 ins has been fixed by a requirement for a clear height of 12 ft 6 ins for equipment. Supporting facilities are located on the eastern side of the building near the lifts and stairs to minimise the movement of staff through equipment areas.

30. Design The building, though surrounded by single-storey and two-storey commercial development, will dominate the area due to its height and position close to the top of a prominent rise. All elevations will thus be equally important.

31. The Committee were told that brickwork had been chosen as the external facing material because it is considered to be appropriate to the design and for economy reasons. The dark-toned clay bricks will be broken by horizontal expansion joints at each floor. To provide interest, the reinforced concrete vertical columns will be recessed on all elevations.

32. To minimise solar heat loads there will be no windows in equipment areas. This will result in lower building costs and reduce the cost of operating the air conditioning system.

33. Structure The structural frame is to be of reinforced concrete. Basement retaining walls, lift and stair wells and floor slabs will also be of reinforced concrete.

34. The site conditions comprise filling over decomposed mudstone and hard mudstone. Spread footings of reinforced concrete founded on mudstone will be used under columns.

35. Finishes The external facing material will be dark-coloured bricks. The roof will be steel decking laid over the future sixth floor slab.

36. Internal finishes have been selected with a view to economy and low maintenance costs. Walls in equipment areas will have an applied vinyl finish over the off-form concrete or flush jointed brick surfaces. Toilet walls are to be finished with ceramic tiles.

37. Floors will be screeded and surfaced with vinyl tiles generally, except in the vehicle park, substation and cable chamber which will be granolithic, and the toilets where coramic tiles will be used.

38. Ceilings in equipment areas will have a vinyl finish applied to the off-form concrete surface. Suspended ceilings will be used in some selected areas.

39. Mechanical Services Generally, the building will be air conditioned from air handling plants on the fifth floor which will be connected to chilled water and boiler plant in the basement. Equipment to air condition the future additional floors will be installed on the fifth floor when required. The existing exchange will also be air conditioned from the new plant as the present heating and ventilation units are no longer economic to maintain.

40. The basement, fifth floor mechanical plant room, lift machinery room, power and battery rooms and stair well will be mechanically ventilated. The ground floor vehicle parking area, toilets, lift machinery and battery rooms will be mechanically exhausted.

41. An automatic start emergency generating plant of 400 kW capacity will be located in the basement. There will be provision for a future set of similar size.

42. Miscellaneous equipment will include domestic hot water supply to basins and sinks, drinking water coolers, sump pumps, a vehicle turntable and hoists in the basement plant room.

43. Electrical Services The State Electricity Commission will supply power through the basement substation. The Commission will supply and instal the substation equipment.

44. The main low voltage switchboard adjacent to the substation will also control supply to the existing building. Facilities will also be provided on this switchboard to enable connections to be made to either the mains or emergency supply. Distribution in the new building will be by means of a vertical riser from the basement to the top floor.

45. Artificial lighting will be from hot cathode fluorescent fittings.

46. Lifts The lift installation will comprise a passenger lift with a capacity of 2,500 lbs (16 persons) operating at a speed of 350 ft per minute and a goods/passenger lift with a capacity of 4,500 lbs at a speed of 250 ft per minute. The latter will be designed to carry telecommunications equipment racks in the vertical position.

47. Fire Protection The building will be served by thermal fire alarms. Automatic sprinklers will protect the ground floor vehicle park and basement. Fire hydrants will be installed at appropriate points. The internal stair well will be fire isolated and an external fire escape is to be provided.

48. The Committee's Conclusion The Committee recommend the construction of the work in this reference.

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PROGRAMME

49. It is expected that after an approval to proceed is given, the preparation of final drawings and tender documents will take about six months. The Committee noted that the construction of the work is expected to take 18 months after a contract is let.

ESTIMATE OF COST

50. The estimated cost of the work when referred to the Committee was \$1.4 million as follows:

Building work	\$695,800
Engineering services	<u>704,200</u>
	<u>\$1,400,000</u>

RECOMMENDATIONS AND CONCLUSIONS

51. The summary of recommendations and conclusions of the Committee is set out below. Alongside each is shown the paragraph in the report to which it refers.

Paragraph

- | | |
|--|----|
| 1. A NEED IS DEVELOPING FOR ADDITIONAL TELECOMMUNICATIONS FACILITIES IN THE HAWTHORN AREA. | 17 |
| 2. IT WOULD BE APPROPRIATE TO PROVIDE THESE FACILITIES IN AN EXTENSION OF THE HAWTHORN TELEPHONE EXCHANGE. | 18 |
| 3. THE COMMITTEE RECOMMEND THE CONSTRUCTION OF THE WORKS IN THIS REFERENCE. | 48 |
| 4. THE ESTIMATED COST OF THE WORK WHEN REFERRED TO THE COMMITTEE WAS \$1.4 MILLION. | 50 |

Parliamentary Standing Committee on
Public Works,
Parliament House,
CANBERRA.

F. G. Chaney
(F. G. CHANEY)
Chairman

30 May 1968.