

1972

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

*Parliamentary Standing Committee on Public Works*

## REPORT

relating to the proposed construction of

# ANULA AND WULAGI NEIGHBOURHOODS

Sanderson District  
Darwin, Northern Territory

(SECOND REPORT OF 1972)

## C O N T E N T S

	<u>Paragraph</u>
The Reference	1
The Committee's Investigation	4
Previous Enquiries	6
Darwin Town Plan	
Outline	10
Residential Lots	15
Shopping Facilities	17
Committee's Conclusion	18
The Need	
Population	19
Demand for Housing	21
Future Development	29
Committee's Conclusion	30
Design of Anula and Wulagi Sub-Divisions	31
Facilities	32
Water Supply	33
Sewerage	35
Electricity	38
Roads and Stormwater Drainage	39
Committee's Conclusion	42
Estimate of Cost	43
Programme	44
Arterial Roads	45
Recommendations and Conclusions	50

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

ANULA AND WULAGI NEIGHBOURHOODS  
SANDERSON DISTRICT  
DARWIN, NORTHERN TERRITORY

R E P O R T

By resolution on 14 October 1971, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for investigation and report to the Parliament, the proposal to construct engineering services in the neighbourhoods of Anula and Wulagi in the Sanderson district, Darwin, Northern Territory.

The Committee have the honour to report as follows:

THE REFERENCE

1. The proposal involves the provision of engineering services to residential and other lots in the Sanderson district neighbourhood units of Anula and Wulagi on the north-eastern outskirts of Darwin. The district will eventually also include the neighbourhoods of Malak and Karama. Anula and Wulagi will provide 1,808 residential blocks and 22 special sites for such purposes as primary schools, flats, service stations, neighbourhood shops, parks, recreation areas, walkways and clubs. In and around the sub-divisions, the proposal includes

- roadwork and drainage including road pavements, kerbs, gutters, footpaths and stormwater drains;
- water supply including mains, fire hydrants and house connections;

- reticulation sewers;
- electricity supply including both high and low tension distribution and street lighting; and
- grading of playing fields and construction of amenities buildings.

2. Services outside the neighbourhoods but associated with those already described involve an arterial road, main water supply and sewerage and electricity services.

3. The estimated cost of the work is \$8.75 million. The proposal is to phase the work commencing with the letting of a contract for the Anula stage in 1971/72. Wulagi will then be programmed according to the demand.

#### THE COMMITTEE'S INVESTIGATION

4. The Committee received written submissions and drawings from the Northern Territory Administration and the Department of Works. At a public hearing in Canberra in November 1971, we took evidence from their representatives and from Mrs. A.D. Lawrie, M.L.C. A written submission was made by Mr. T.A. Bell, M.L.C.

5. We inspected the sites for the proposed sub-divisions when in Darwin earlier in 1971 on other business.

6. Previous Enquiries The Sanderson district is one of a number of areas on the north-east outskirts of Darwin being developed or planned for residential purposes. The provision of engineering services, housing and community facilities in the Casuarina district which comprises the neighbourhoods of Alawa, Jingili, Moil and Wagaman, is almost completed.

7. The Dripstone district is being developed and in this connection, it is relevant to note the Committee's conclusion in its report on the Wagaman sub-division in 1969, that "... urgent consideration should be given to whether the Commonwealth is justified, in the present circumstances, in continuing as the sole developer of urban land in Darwin". We were told that Dripstone's Nakara, Wanguri and Tiwi will have been completely serviced by the Commonwealth by mid-1972 and that Brinkin's 600 lots are being offered publicly for private development. The proposal envisages the selected developer being responsible for roads, services, a kindergarten site, parklands and other amenities, and being able to dispose of business and residential lots on a commercial basis. The servicing of Dripstone is therefore expected to be completed in 1972/73 when house and other serviced lots in Brinkin first become available.

8. Casuarina, Dripstone and the Sanderson district which are located east of Rapid Creek are being developed in accordance with the approved town plan. Each is to have four neighbourhoods, with Casuarina and Dripstone each producing about 2,400 residential and other lots and Sanderson some 4,000.

9. The Committee since 1965 have reported separately on the provision of engineering services to each of the four neighbourhoods of the Casuarina district. We have also reported on the provision of engineering services for the district of Dripstone as a whole. During that same period, reports have also been tabled on the provision of main engineering services outside the sub-divisions, including water supply augmentation (1965 and 1969), extensions to Stokes Hill Power Station (1967 and 1971) and sewerage augmentation (1969 and 1971).

DARWIN TOWN PLAN

10.        Outline        The current Darwin town plan which was initiated in 1965 and based on modern town planning techniques, has permitted future growth to be planned in an orderly manner. The unit of design, the neighbourhood, has its own internal street pattern, deliberately planned to exclude or deter the use of internal roads by through traffic. The outer roads of each unit usually connect to form a pattern of secondary roads to carry outward bound traffic to the arterial road system.
11.        Recent development has involved the grouping of four neighbourhood units into a district, each district being provided with a commercial centre, a high school, parks, public utilities and other district services. The neighbourhood units have each yielded some 600 residential lots, as well as sites for parks, primary schools and shops.
12.        However, with the Sanderson district it is proposed to change this pattern of development. Residential lots in each neighbourhood are to be increased to between 900 and 1,000. The Committee were told that optimum sized primary schools can then be constructed and it will also ensure the development of viable neighbourhood shopping centres to satisfy the convenience shopping needs of the community.
13.        Pedestrian parkway spines extending from the perimeter of each unit and converging on the community centre and primary school are also planned instead of the small scattered neighbourhood parks common to earlier sub-divisions. This involves the introduction of loop road systems and culs-de-sac opening on to parkways thus discouraging through traffic. It also enables economic maintenance of open areas, drainage and floodways

clear of development and provides pedestrians, particularly school children, with access to schools, playing fields and shops with minimum traffic interference.

14. The town plan has been based on the use for urban purposes of mainly vacant Crown land located north-east of the city beyond the R.A.A.F./Airport complex and east of Rapid Creek. This area can eventually provide four districts, apart from Casuarina and Dripstone, viz. Sanderson, Leanyer, Thorak and Holmes.

15. Residential Lots One of the conclusions reached by the Committee in 1965 when considering the Alawa sub-division was that " ... the designs proposed for the Alawa unit are satisfactory and set a standard which subsequent units in the Casuarina district might follow". These standards were endorsed subsequently for use in the other Casuarina suburbs and in Dripstone. In relation to lot sizes, they produce average lot dimensions of 8,000 sq. ft, with frontages between 70 ft and 85 ft and depths up to 100 ft, depending on location within the overall layout. The Committee were told that lots of these dimensions continue to provide an appropriate setting for houses designed for a tropical environment where maximum cross ventilation is a design necessity. There is also a need to allow for the establishment of landscaping to absorb street and house noises and to provide adequate outdoor living space.

16. Larger lots are not desirable because of the high cost of continuous watering during the dry season and the need to keep growth under control during the wet. A reasonable depth is required to provide sufficient space behind the houses for lawns, trees and other outdoor facilities.

17.        Shopping Facilities        The Committee were told that a regional shopping and commercial centre will not be developed in the Sanderson district as provision has been made for adequate facilities at the Dripstone centre to meet the needs of Sanderson residents. However, there is a requirement for a small group of shops in each neighbourhood for the minor family needs, particularly at times when the main shopping centre is closed. These local shops are to be conveniently located, generally near the central park in each neighbourhood.

18.        Committee's Conclusion        The Committee believe it is appropriate, in accordance with the approval town plan, for the district of Sanderson to be the site for the next stage of urban development in Darwin. We also agree that the plan to increase the size of the neighbourhood units to between 900 and 1,000 lots is soundly based. We note that other principles of town planning design and engineering standards adopted for previous district development have been satisfactory and we agree that they should be repeated in Sanderson.

#### THE NEED

19.        Population        The work proposals mentioned in paragraph 9 above have all been concerned with meeting the domestic needs of a steadily growing urban population in Darwin. In each case, the need for the work was created, in general terms, by a population whose annual increment was some 7% over a twenty year period to 1966 and about 11% compound since then. At the 1966 Census the population of Darwin was 21,671 persons. At June 1970, this figure had increased to 32,943.

20.        Recent studies on the growth of Darwin suggest that the population could increase at about 10.8% until 1975 and 10.4% between



1975 and 1980. This would mean a Darwin population of 55,000 in 1975 and 90,000 in 1980. The Committee noted that initially most of the additional people will need to be housed in the remainder of the Dripstone district and in Sanderson, even though greater use of flats might be expected in older areas of Darwin and some increase in private sub-division may occur.

21. Demand for Housing . The pressures being created by the growing rate of population increase are underlined by the accelerating demand for housing and for serviced residential land. We were provided with the following facts, which collectively clearly show that there is a continuing heavy demand for serviced residential blocks.

22. The housing waiting list for employees of the Commonwealth in the Northern Territory has grown from 118 to 319 in the three years since 1968. The average waiting time is now twelve months. On the question of the provision of Government housing, the Committee noted with interest that no further suitable land exists at the R.A.A.F. Base in Darwin to meet that Service's requirements beyond 1971-72 and that a request has been made for 140 serviced residential blocks in the Darwin area for that part of the housing construction programme in 1972-73.

23. The waiting list of applicants for Northern Territory Housing Commission accommodation grew from 760 in 1966 to 969 in 1969, notwithstanding the allocation of 1,019 housing or flat units in that period. At 30 June 1971 the waiting list had been reduced to 571 following an exceptionally heavy run of allocations. The waiting time for a one-bedroom flat is now nine to ten months, for a two-bedroom flat three to four months and for a house eight to nine months. Because insufficient serviced land is available to the Commission in 1971-72, it has been found necessary to programme the construction of 70 walk-up flats.

24. The Committee were told that due to the housing shortage, rents averaging \$55 per week are being paid for three-bedroom furnished houses and that rents upwards of \$70 are not uncommon. When Commonwealth housing is unavailable for its staff recruited from outside the Northern Territory, the Commonwealth meets part of the accommodation expenses of renting private premises and these payments are expected to reach \$150,000 in 1971-72 compared with \$28,000 in 1967-68.

25. Residential lots for privately built housing become available either from land serviced by the Government or developed privately. The extent of the demand for this type of land is difficult to gauge but it is evident from the high premiums paid at public auctions of Government developed lots that there is a considerable demand in this area. At sales of 510 lots over the last four years, premiums have ranged as high as \$18,500.

26. The unsatisfied demand among those wishing to build their own homes has stimulated the development for residential purposes of privately owned or leased land. Although some lots have become available in this way in the last few years, it seems that the total demand is such that the relatively small supply will make little, if any, impact on the need for land to be served in Sanderson.

27. As noted in previous reports, more and more people are forced to live permanently in caravans located not only in caravan parks but also in back yards or under houses. In June 1970 some 2,200 persons were living in caravans and of these 1,252 lived on private premises with the remainder in caravan parks.

28. The Government's programme for land servicing has allowed for 1,174 lots to be commenced in 1970-71 and 635 in 1971-72. As mentioned in paragraph 7 a further 600 lots will be available in Brinkin in 1972-73. However, only 807 lots were available for the commencement of housing construction in 1970-71, of which 238 were for Government housing, 320 for Housing Commission and 249 for public auction. In 1971-72 about 772 lots are planned to be available, 250 for Government housing, 250 for Housing Commission, 210 for public auction, 18 for special purposes, with 44 becoming available for allocation in the following year.

29. Future Development It is planned that the remaining two neighbourhood units of the Sanderson district, Malak and Karama, will be the next sub-divisional proposals for Darwin and they will be referred to the Committee when the demand justifies their development. Recommendations concerning subsequent sub-divisions will be based on the results of a current study which is assessing the requirements for serviced land for a population of up to 200,000 people.

30. Committee's Conclusion It is clear that Darwin's population is maintaining a steady growth rate and that consequently there is a continuing requirement for serviced residential land. As the Government is virtually the sole developer of urban land, the Committee concluded that there is a need for the proposed engineering services to be provided in the Sanderson neighbourhoods of Anula and Wulagi.

#### DESIGN OF ANULA AND WULAGI SUB-DIVISIONS

31. Apart from the exceptions mentioned in paragraphs 12 and 13, it is proposed that the designs for Anula and Wulagi will be similar to those

followed for the neighbourhoods in the Casuarina and Dripstone districts. The principles of town planning design affecting road layout and dimensions, discussed in paragraphs 10 to 16, are being adopted. Due to the increased size of the neighbourhoods, the district will be larger than those previously developed and in this instance, Anula and Wulagi will together provide 1,808 residential lots and 22 special sites.

32. Facilities Anula will provide 874 residential lots, four recreation walkways, a central recreation area and sites for a primary school, service station, a block of shops, flats and four special sites for clubs, organizations, etc. Wulagi will contain 934 residential lots, three recreation walkways, two parks, a central recreation area and sites for a primary school, a service station and a block of shops. It is proposed that the main shopping and commercial needs of residents will be met by the facilities to be constructed in Dripstone.

33. Water Supply Water supply will be reticulated throughout the neighbourhoods by pipes located generally within the footpath reservations. Water for fire protection requirements will be delivered from 2½ in. diameter millocks on standpipes at appropriate points. Internal trunk mains have been sized to cater for future development of the Lee Point area and for the future Sanderson neighbourhoods.

34. Water supply works in this reference, to be constructed outside the area, include a 27 in. diameter main along McMillan's Road and augmentation of pumping capacity from the storage tanks at Moil.

35. Sewerage Within the sub-divisions sewerage will be reticulated in a system of varying sized mains laid mainly at the rear of blocks to minimise the length of connections.

36. A trunk sewer, varying in diameter up to 42 in. will run from Wulagi to the Northern Zone treatment works at Leanyer Swamp. The sewer has been designed to serve not only Wulagi and part of Anula but also areas to the east and to the south and an area to the north, all of which are planned for future development. The trunk sewer will be constructed of P.V.C. lined reinforced concrete pipes.

37. Sewerage from about 400 houses in the south-western corner of Anula will be gravity-fed into the Northern Zone trunk sewer in Noil.

38. Electricity Normal Darwin standards for 11 kV and low voltage reticulation and distribution substations are to be adopted. The 11 kV lines will come from the Casuarina Zone substation now under construction. Street lighting will comprise sodium and mercury vapour lamps on main traffic routes and twin 20 watt fluorescent lights in minor streets.

39. Roads and Stormwater Drainage Around the boundaries of the neighbourhoods, where through traffic as well as local traffic is to be provided for, road widths will depend on the expected traffic density. Along the western perimeter of Anula and Wulagi the second half of Lee Point Road will be constructed 36 ft wide. Vanderlin Drive will be continued from Wanguri and Wagaman along the northern boundary of Wulagi with the first of dual 36 ft carriageways.

40. The first carriageway of the proposed Palmerston arterial road along the southern perimeter of Anula will also be 36 ft wide, the second carriageway to be constructed when the need arises. The boundary road between Anula and Wulagi and the road marking their eastern perimeters

will be 38 ft wide. Within the neighbourhoods distributor roads will be 34 ft wide and residential roads 24 ft wide.

41. Roads carrying higher density traffic are to be surfaced with one inch of bituminous concrete. Other roads will have a bitumen surface seal. Footpaths will be surfaced with bituminous concrete. Stormwater will be directed along kerbs and gutters into side-entry pits at intervals along the roads and conveyed by an underground pipe system throughout the neighbourhoods.

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

#### ESTIMATE OF COST

43. The estimated cost of the work when referred to the Committee was \$8.75 million made up as follows:

	\$
Roadworks and stormwater drainage	4,350,000
Water supply	900,000
Sewerage	650,000
Electrical services	660,000
Amenity blocks, playing fields etc.	240,000
External services	<u>1,950,000</u>
	<u>8,750,000</u>

#### PROGRAMME

44. Due to urgency, the design and documentation of the first stage of Anula neighbourhood was authorised in August 1971 and will be ready for tender by the time this report is presented. The Committee were

informed that the timing of documentation for the balance of the neighbourhoods will depend on the number of stages into which the project is divided. It is expected that design will take up to six months for each stage, but if required the different stages can be designed concurrently. The first stage of Anula will take approximately two years for construction. Later stages would require a comparable time.

#### ARTERIAL ROADS

45. The four previous reports of the Committee dealing with the development of Jingili (1967), Moil (1968), Wagaman (1969) and Dripstone (1970) have all been most critical of the absence of a positive approach to the planning of the arterial road system for Darwin and in particular the link between the city area and the suburbs on the north eastern extremity of the city.

46. Some progress has been achieved in that improvements have been effected to Bagot Road and work is advanced on upgrading the Stuart Highway between the Bagot Road intersection and the city. It is, however, regrettable that we are compelled to again report that there is no tangible proof that the protracted planning of the second arterial, the Palmerston Freeway, is bearing fruit. We noted in 1969 that the existing access " ... will be capable of handling something in excess of Moil and would be capable of meeting the situation until at least mid-1972". Despite this recognition that further access would be required to be in use about now, we were told during the present hearing that " a considerable amount of survey investigation and sketch design work has been done on the Palmerston route. Careful investigation of a number of alternative routes

is required in the Fannie Bay - Ludmilla Creek area and these all involve foundation problems where the road crosses the swamp. These investigations are well advanced".

47. Present evidence is that the traffic congestion problems on the Stuart Highway/Bagot Road access continue to grow and the urban development taking place in the north-eastern suburbs is continuing to aggravate these difficulties. Not illogically, it was submitted to the Committee by Mrs. A.D. Lawrie, M.L.C. that the present reference be rejected because there is no solution in sight to the road access difficulty.

48. It has been apparent from the evidence at this and previous enquiries that although the Government recognises the nature and extent of the problem, it has failed to heed the Committee's repeated recommendations and to take appropriate action. We have been told of the various studies and surveys being conducted but to date, these have not produced a positive plan or evidence of action which demonstrates that the alleviation of the problem is in sight. We again direct the attention of the Parliament to this serious shortcoming and strongly recommend that immediate attention be given to the planning and construction of the Palmerston Freeway.

49. Whilst we do not support a rejection or deferment of the current proposal because of the road difficulty, in the Committee's view the situation is so deplorable and urgent that we believe that the Government should, as a matter of priority, examine the possibility of further increasing the capacity of the Stuart Highway/Bagot Road access to meet the peak traffic needs of Darwin, particularly in the critical period before the Palmerston Freeway is available.



RECOMMENDATIONS AND CONCLUSIONS

50. 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.

	<u>Paragraph</u>
1. IT IS APPROPRIATE FOR THE DISTRICT OF SANDERSON TO BE THE SITE FOR THE NEXT STAGE OF URBAN DEVELOPMENT IN DARWIN.	18
2. THE PLAN TO INCREASE THE SIZE OF NEIGHBOURHOOD UNITS TO BETWEEN 900 AND 1,000 LOTS IS SOUNDLY BASED.	18
3. OTHER PRINCIPLES OF TOWN PLANNING DESIGN AND ENGINEERING STANDARDS ADOPTED FOR PREVIOUS DISTRICT DEVELOPMENT SHOULD BE REPEATED IN SANDERSON.	18
4. THERE IS A CONTINUING REQUIREMENT FOR SERVICED RESIDENTIAL LAND IN DARWIN.	30
5. THERE IS A NEED FOR THE PROPOSED ENGINEERING SERVICES TO BE PROVIDED IN THE SANDERSON NEIGHBOURHOODS OF ANULA AND WULAGI.	30
6. THE COMMITTEE RECOMMEND THE CONSTRUCTION OF THE WORK IN THIS REFERENCE.	42
7. THE ESTIMATED COST OF THE WORK WHEN REFERRED TO THE COMMITTEE WAS \$8.75 MILLION.	43

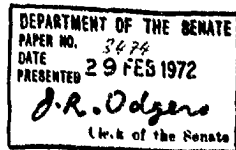
Paragraph

8. IMMEDIATE ATTENTION SHOULD BE GIVEN TO THE  
PLANNING AND CONSTRUCTION OF THE PALMERSTON  
FREEWAY. 48
9. THE GOVERNMENT SHOULD AS A MATTER OF  
PRIORITY EXAMINE THE POSSIBILITY OF FURTHER  
INCREASING THE CAPACITY OF THE STUART HIGHWAY/  
BAGOT ROAD ACCESS. 49

(C.R. KELLY)  
Chairman

Parliamentary Standing Committee on Public Works,  
Parliament House,  
CANBERRA, A.C.T.

24 February 1972.



1972

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

*Parliamentary Standing Committee on Public Works*

## REPORT

relating to the proposed construction of

# ANULA AND WULAGI NEIGHBOURHOODS

Sanderson District  
Darwin, Northern Territory

(SECOND REPORT OF 1972)

## C O N T E N T S

	<u>Paragraph</u>
The Reference	1
The Committee's Investigation	4
Previous Enquiries	6
Darwin Town Plan	
Outline	10
Residential Lots	15
Shopping Facilities	17
Committee's Conclusion	18
The Need	
Population	19
Demand for Housing	21
Future Development	29
Committee's Conclusion	30
Design of Anula and Wulagi Sub-Divisions	31
Facilities	32
Water Supply	33
Sewerage	35
Electricity	38
Roads and Stormwater Drainage	39
Committee's Conclusion	42
Estimate of Cost	43
Programme	44
Arterial Roads	45
Recommendations and Conclusions	50

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

ANULA AND WULAGI NEIGHBOURHOODS  
SANDERSON DISTRICT  
DARWIN, NORTHERN TERRITORY

R E P O R T

By resolution on 14 October 1971, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for investigation and report to the Parliament, the proposal to construct engineering services in the neighbourhoods of Anula and Wulagi in the Sanderson district, Darwin, Northern Territory.

The Committee have the honour to report as follows:

THE REFERENCE

1. The proposal involves the provision of engineering services to residential and other lots in the Sanderson district neighbourhood units of Anula and Wulagi on the north-eastern outskirts of Darwin. The district will eventually also include the neighbourhoods of Malak and Karama. Anula and Wulagi will provide 1,808 residential blocks and 22 special sites for such purposes as primary schools, flats, service stations, neighbourhood shops, parks, recreation areas, walkways and clubs. In and around the sub-divisions, the proposal includes

- roadwork and drainage including road pavements, kerbs, gutters, footpaths and stormwater drains;
- water supply including mains, fire hydrants and house connections;

- reticulation sewers;
- electricity supply including both high and low tension distribution and street lighting; and
- grading of playing fields and construction of amenities buildings.

2. Services outside the neighbourhoods but associated with those already described involve an arterial road, main water supply and sewerage and electricity services.

3. The estimated cost of the work is \$8.75 million. The proposal is to phase the work commencing with the letting of a contract for the Anula stage in 1971/72. Wulagi will then be programmed according to the demand.

#### THE COMMITTEE'S INVESTIGATION

4. The Committee received written submissions and drawings from the Northern Territory Administration and the Department of Works. At a public hearing in Canberra in November 1971, we took evidence from their representatives and from Mrs. A.D. Lawrie, M.L.C. A written submission was made by Mr. T.A. Bell, M.L.C.

5. We inspected the sites for the proposed sub-divisions when in Darwin earlier in 1971 on other business.

6. Previous Enquiries The Sanderson district is one of a number of areas on the north-east outskirts of Darwin being developed or planned for residential purposes. The provision of engineering services, housing and community facilities in the Casuarina district which comprises the neighbourhoods of Alawa, Jingili, Moil and Wagaman, is almost completed.

7. The Dripstone district is being developed and in this connection, it is relevant to note the Committee's conclusion in its report on the Wagaman sub-division in 1969, that "... urgent consideration should be given to whether the Commonwealth is justified, in the present circumstances, in continuing as the sole developer of urban land in Darwin". We were told that Dripstone's Nakara, Wanguri and Tiwi will have been completely serviced by the Commonwealth by mid-1972 and that Brinkin's 600 lots are being offered publicly for private development. The proposal envisages the selected developer being responsible for roads, services, a kindergarten site, parklands and other amenities, and being able to dispose of business and residential lots on a commercial basis. The servicing of Dripstone is therefore expected to be completed in 1972/73 when house and other serviced lots in Brinkin first become available.

8. Casuarina, Dripstone and the Sanderson district which are located east of Rapid Creek are being developed in accordance with the approved town plan. Each is to have four neighbourhoods, with Casuarina and Dripstone each producing about 2,400 residential and other lots and Sanderson some 4,000.

9. The Committee since 1965 have reported separately on the provision of engineering services to each of the four neighbourhoods of the Casuarina district. We have also reported on the provision of engineering services for the district of Dripstone as a whole. During that same period, reports have also been tabled on the provision of main engineering services outside the sub-divisions, including water supply augmentation (1965 and 1969), extensions to Stokes Hill Power Station (1967 and 1971) and sewerage augmentation (1969 and 1971).

DARWIN TOWN PLAN

10. Outline The current Darwin town plan which was initiated in 1965 and based on modern town planning techniques, has permitted future growth to be planned in an orderly manner. The unit of design, the neighbourhood, has its own internal street pattern, deliberately planned to exclude or deter the use of internal roads by through traffic. The outer roads of each unit usually connect to form a pattern of secondary roads to carry outward bound traffic to the arterial road system.
11. Recent development has involved the grouping of four neighbourhood units into a district, each district being provided with a commercial centre, a high school, parks, public utilities and other district services. The neighbourhood units have each yielded some 600 residential lots, as well as sites for parks, primary schools and shops.
12. However, with the Sanderson district it is proposed to change this pattern of development. Residential lots in each neighbourhood are to be increased to between 900 and 1,000. The Committee were told that optimum sized primary schools can then be constructed and it will also ensure the development of viable neighbourhood shopping centres to satisfy the convenience shopping needs of the community.
13. Pedestrian parkway spines extending from the perimeter of each unit and converging on the community centre and primary school are also planned instead of the small scattered neighbourhood parks common to earlier sub-divisions. This involves the introduction of loop road systems and culs-de-sac opening on to parkways thus discouraging through traffic. It also enables economic maintenance of open areas, drainage and floodways



clear of development and provides pedestrians, particularly school children, with access to schools, playing fields and shops with minimum traffic interference.

14. The town plan has been based on the use for urban purposes of mainly vacant Crown land located north-east of the city beyond the R.A.A.F./Airport complex and east of Rapid Creek. This area can eventually provide four districts, apart from Casuarina and Dripstone, viz. Sanderson, Leanyer, Thorak and Holmes.

15. Residential Lots One of the conclusions reached by the Committee in 1965 when considering the Alawa sub-division was that " ... the designs proposed for the Alawa unit are satisfactory and set a standard which subsequent units in the Casuarina district might follow". These standards were endorsed subsequently for use in the other Casuarina suburbs and in Dripstone. In relation to lot sizes, they produce average lot dimensions of 8,000 sq. ft, with frontages between 70 ft and 85 ft and depths up to 100 ft, depending on location within the overall layout. The Committee were told that lots of these dimensions continue to provide an appropriate setting for houses designed for a tropical environment where maximum cross ventilation is a design necessity. There is also a need to allow for the establishment of landscaping to absorb street and house noises and to provide adequate outdoor living space.

16. Larger lots are not desirable because of the high cost of continuous watering during the dry season and the need to keep growth under control during the wet. A reasonable depth is required to provide sufficient space behind the houses for lawns, trees and other outdoor facilities.

17.        Shopping Facilities        The Committee were told that a regional shopping and commercial centre will not be developed in the Sanderson district as provision has been made for adequate facilities at the Dripstone centre to meet the needs of Sanderson residents. However, there is a requirement for a small group of shops in each neighbourhood for the minor family needs, particularly at times when the main shopping centre is closed. These local shops are to be conveniently located, generally near the central park in each neighbourhood.

18.        Committee's Conclusion        The Committee believe it is appropriate, in accordance with the approval town plan, for the district of Sanderson to be the site for the next stage of urban development in Darwin. We also agree that the plan to increase the size of the neighbourhood units to between 900 and 1,000 lots is soundly based. We note that other principles of town planning design and engineering standards adopted for previous district development have been satisfactory and we agree that they should be repeated in Sanderson.

#### THE NEED

19.        Population        The work proposals mentioned in paragraph 9 above have all been concerned with meeting the domestic needs of a steadily growing urban population in Darwin. In each case, the need for the work was created, in general terms, by a population whose annual increment was some 7% over a twenty year period to 1966 and about 11% compound since then. At the 1966 Census the population of Darwin was 21,671 persons. At June 1970, this figure had increased to 32,943.

20.        Recent studies on the growth of Darwin suggest that the population could increase at about 10.8% until 1975 and 10.4% between

1975 and 1980. This would mean a Darwin population of 55,000 in 1975 and 90,000 in 1980. The Committee noted that initially most of the additional people will need to be housed in the remainder of the Dripstone district and in Sanderson, even though greater use of flats might be expected in older areas of Darwin and some increase in private sub-division may occur.

21. Demand for Housing . The pressures being created by the growing rate of population increase are underlined by the accelerating demand for housing and for serviced residential land. We were provided with the following facts, which collectively clearly show that there is a continuing heavy demand for serviced residential blocks.

22. The housing waiting list for employees of the Commonwealth in the Northern Territory has grown from 118 to 319 in the three years since 1968. The average waiting time is now twelve months. On the question of the provision of Government housing, the Committee noted with interest that no further suitable land exists at the R.A.A.F. Base in Darwin to meet that Service's requirements beyond 1971-72 and that a request has been made for 140 serviced residential blocks in the Darwin area for that part of the housing construction programme in 1972-73.

23. The waiting list of applicants for Northern Territory Housing Commission accommodation grew from 760 in 1966 to 969 in 1969, notwithstanding the allocation of 1,019 housing or flat units in that period. At 30 June 1971 the waiting list had been reduced to 571 following an exceptionally heavy run of allocations. The waiting time for a one-bedroom flat is now nine to ten months, for a two-bedroom flat three to four months and for a house eight to nine months. Because insufficient serviced land is available to the Commission in 1971-72, it has been found necessary to programme the construction of 70 walk-up flats.

24. The Committee were told that due to the housing shortage, rents averaging \$55 per week are being paid for three-bedroom furnished houses and that rents upwards of \$70 are not uncommon. When Commonwealth housing is unavailable for its staff recruited from outside the Northern Territory, the Commonwealth meets part of the accommodation expenses of renting private premises and these payments are expected to reach \$150,000 in 1971-72 compared with \$28,000 in 1967-68.

25. Residential lots for privately built housing become available either from land serviced by the Government or developed privately. The extent of the demand for this type of land is difficult to gauge but it is evident from the high premiums paid at public auctions of Government developed lots that there is a considerable demand in this area. At sales of 510 lots over the last four years, premiums have ranged as high as \$18,500.

26. The unsatisfied demand among those wishing to build their own homes has stimulated the development for residential purposes of privately owned or leased land. Although some lots have become available in this way in the last few years, it seems that the total demand is such that the relatively small supply will make little, if any, impact on the need for land to be served in Sanderson.

27. As noted in previous reports, more and more people are forced to live permanently in caravans located not only in caravan parks but also in back yards or under houses. In June 1970 some 2,200 persons were living in caravans and of these 1,252 lived on private premises with the remainder in caravan parks.

28. The Government's programme for land servicing has allowed for 1,174 lots to be commenced in 1970-71 and 635 in 1971-72. As mentioned in paragraph 7 a further 600 lots will be available in Brinkin in 1972-73. However, only 807 lots were available for the commencement of housing construction in 1970-71, of which 238 were for Government housing, 320 for Housing Commission and 249 for public auction. In 1971-72 about 772 lots are planned to be available, 250 for Government housing, 250 for Housing Commission, 210 for public auction, 18 for special purposes, with 44 becoming available for allocation in the following year.

29. Future Development It is planned that the remaining two neighbourhood units of the Sanderson district, Malak and Karama, will be the next sub-divisional proposals for Darwin and they will be referred to the Committee when the demand justifies their development. Recommendations concerning subsequent sub-divisions will be based on the results of a current study which is assessing the requirements for serviced land for a population of up to 200,000 people.

30. Committee's Conclusion It is clear that Darwin's population is maintaining a steady growth rate and that consequently there is a continuing requirement for serviced residential land. As the Government is virtually the sole developer of urban land, the Committee concluded that there is a need for the proposed engineering services to be provided in the Sanderson neighbourhoods of Anula and Wulagi.

#### DESIGN OF ANULA AND WULAGI SUB-DIVISIONS

31. Apart from the exceptions mentioned in paragraphs 12 and 13, it is proposed that the designs for Anula and Wulagi will be similar to those

followed for the neighbourhoods in the Casuarina and Dripstone districts. The principles of town planning design affecting road layout and dimensions, discussed in paragraphs 10 to 16, are being adopted. Due to the increased size of the neighbourhoods, the district will be larger than those previously developed and in this instance, Anula and Wulagi will together provide 1,808 residential lots and 22 special sites.

32. Facilities Anula will provide 874 residential lots, four recreation walkways, a central recreation area and sites for a primary school, service station, a block of shops, flats and four special sites for clubs, organizations, etc. Wulagi will contain 934 residential lots, three recreation walkways, two parks, a central recreation area and sites for a primary school, a service station and a block of shops. It is proposed that the main shopping and commercial needs of residents will be met by the facilities to be constructed in Dripstone.

33. Water Supply Water supply will be reticulated throughout the neighbourhoods by pipes located generally within the footpath reservations. Water for fire protection requirements will be delivered from 2½ in. diameter millcocks on standpipes at appropriate points. Internal trunk mains have been sized to cater for future development of the Lee Point area and for the future Sanderson neighbourhoods.

34. Water supply works in this reference, to be constructed outside the area, include a 27 in. diameter main along McMillan's Road and augmentation of pumping capacity from the storage tanks at Moil.

35. Sewerage Within the sub-divisions sewerage will be reticulated in a system of varying sized mains laid mainly at the rear of blocks to minimise the length of connections.

36. A trunk sewer, varying in diameter up to 42 in. will run from Wulagi to the Northern Zone treatment works at Leanyer Swamp. The sewer has been designed to serve not only Wulagi and part of Anula but also areas to the east and to the south and an area to the north, all of which are planned for future development. The trunk sewer will be constructed of P.V.C. lined reinforced concrete pipes.

37. Sewerage from about 400 houses in the south-western corner of Anula will be gravity-fed into the Northern Zone trunk sewer in Moil.

38. Electricity Normal Darwin standards for 11 kV and low voltage reticulation and distribution substations are to be adopted. The 11 kV lines will come from the Casuarina Zone substation now under construction. Street lighting will comprise sodium and mercury vapour lamps on main traffic routes and twin 20 watt fluorescent lights in minor streets.

39. Roads and Stormwater Drainage Around the boundaries of the neighbourhoods, where through traffic as well as local traffic is to be provided for, road widths will depend on the expected traffic density. Along the western perimeter of Anula and Wulagi the second half of Lee Point Road will be constructed 36 ft wide. Vanderlin Drive will be continued from Wanguri and Wagaman along the northern boundary of Wulagi with the first of dual 36 ft carriageways.

40. The first carriageway of the proposed Palmerston arterial road along the southern perimeter of Anula will also be 36 ft wide, the second carriageway to be constructed when the need arises. The boundary road between Anula and Wulagi and the road marking their eastern perimeters

will be 38 ft wide. Within the neighbourhoods distributor roads will be 34 ft wide and residential roads 24 ft wide.

41. Roads carrying higher density traffic are to be surfaced with one inch of bituminous concrete. Other roads will have a bitumen surface seal. Footpaths will be surfaced with bituminous concrete. Stormwater will be directed along kerbs and gutters into side-entry pits at intervals along the roads and conveyed by an underground pipe system throughout the neighbourhoods.

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

ESTIMATE OF COST

43. The estimated cost of the work when referred to the Committee was \$8.75 million made up as follows:

	3
Roadworks and stormwater drainage	4,350,000
Water supply	900,000
Sewerage	650,000
Electrical services	660,000
Amenity blocks, playing fields etc.	240,000
External services	1,950,000
	<u>8,750,000</u>

PROGRAMME

44. Due to urgency, the design and documentation of the first stage of Anula neighbourhood was authorised in August 1971 and will be ready for tender by the time this report is presented. The Committee were



informed that the timing of documentation for the balance of the neighbourhoods will depend on the number of stages into which the project is divided. It is expected that design will take up to six months for each stage, but if required the different stages can be designed concurrently. The first stage of Anula will take approximately two years for construction. Later stages would require a comparable time.

#### ARTERIAL ROADS

45. The four previous reports of the Committee dealing with the development of Jingili (1967), Moil (1968), Wagaman (1969) and Dripstone (1970) have all been most critical of the absence of a positive approach to the planning of the arterial road system for Darwin and in particular the link between the city area and the suburbs on the north eastern extremity of the city.

46. Some progress has been achieved in that improvements have been effected to Bagot Road and work is advanced on upgrading the Stuart Highway between the Bagot Road intersection and the city. It is, however, regrettable that we are compelled to again report that there is no tangible proof that the protracted planning of the second arterial, the Palmerston Freeway, is bearing fruit. We noted in 1969 that the existing access " ... will be capable of handling something in excess of Moil and would be capable of meeting the situation until at least mid-1972". Despite this recognition that further access would be required to be in use about now, we were told during the present hearing that " a considerable amount of survey investigation and sketch design work has been done on the Palmerston route. Careful investigation of a number of alternative routes

is required in the Fannie Bay - Ludmilla Creek area and these all involve foundation problems where the road crosses the swamp. These investigations are well advanced".

47. Present evidence is that the traffic congestion problems on the Stuart Highway/Bagot Road access continue to grow and the urban development taking place in the north-eastern suburbs is continuing to aggravate these difficulties. Not illogically, it was submitted to the Committee by Mrs. A.D. Lawrie, M.L.C. that the present reference be rejected because there is no solution in sight to the road access difficulty.

48. It has been apparent from the evidence at this and previous enquiries that although the Government recognises the nature and extent of the problem, it has failed to heed the Committee's repeated recommendations and to take appropriate action. We have been told of the various studies and surveys being conducted but to date, these have not produced a positive plan or evidence of action which demonstrates that the alleviation of the problem is in sight. We again direct the attention of the Parliament to this serious shortcoming and strongly recommend that immediate attention be given to the planning and construction of the Palmerston Freeway.

49. Whilst we do not support a rejection or deferment of the current proposal because of the road difficulty, in the Committee's view the situation is so deplorable and urgent that we believe that the Government should, as a matter of priority, examine the possibility of further increasing the capacity of the Stuart Highway/Bagot Road access to meet the peak traffic needs of Darwin, particularly in the critical period before the Palmerston Freeway is available.

RECOMMENDATIONS AND CONCLUSIONS

50. 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.

	<u>Paragraph</u>
1. IT IS APPROPRIATE FOR THE DISTRICT OF SANDERSON TO BE THE SITE FOR THE NEXT STAGE OF URBAN DEVELOPMENT IN DARWIN.	18
2. THE PLAN TO INCREASE THE SIZE OF NEIGHBOURHOOD UNITS TO BETWEEN 900 AND 1,000 LOTS IS SOUNDLY BASED.	18
3. OTHER PRINCIPLES OF TOWN PLANNING DESIGN AND ENGINEERING STANDARDS ADOPTED FOR PREVIOUS DISTRICT DEVELOPMENT SHOULD BE REPEATED IN SANDERSON.	18
4. THERE IS A CONTINUING REQUIREMENT FOR SERVICED RESIDENTIAL LAND IN DARWIN.	30
5. THERE IS A NEED FOR THE PROPOSED ENGINEERING SERVICES TO BE PROVIDED IN THE SANDERSON NEIGHBOURHOODS OF ANULA AND WULAGI.	30
6. THE COMMITTEE RECOMMEND THE CONSTRUCTION OF THE WORK IN THIS REFERENCE.	42
7. THE ESTIMATED COST OF THE WORK WHEN REFERRED TO THE COMMITTEE WAS \$8.75 MILLION.	43

