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THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

## REPORT

relating to the proposed provision of

# ENGINEERING SERVICES DISTRICT OF DRIPSTONE

at

## Darwin, Northern Territory

(SIXTEENTH REPORT OF 1970)

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## 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	9
Residential Lots	12
Shopping Facilities	15
The Committee's Conclusion	16
The Need	
Population	17
Demand for Housing	19
Committee's Conclusion	26
Design of Dripstone District	27
Shopping and Commercial Facilities	28
Sewerage	32
Electricity	34
Roads and Footpaths	35
Stormwater Drainage	38
Committee's Conclusion	39
Estimate of Cost	40
Programme	41
Other Observations	
Arterial Roads	44
Bridge over Rapid Creek	47
Recommendations and Conclusions	50

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

ENGINEERING SERVICES, DISTRICT OF DRIPSTONE  
DARWIN, NORTHERN TERRITORY

R E P O R T

On 29 July 1970, His Excellency the Governor-General in Council referred to the Parliamentary Standing Committee on Public Works for investigation and report to the Parliament the proposal to provide engineering services to the District of Dripstone, 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 Dripstone district on the north-eastern outskirts of Darwin which will encompass the neighbourhood units of Nakara, Wanguri, Brinkin and Tiwi. The district will provide 2,344 residential blocks and 82 special sites including a 30-acre commercial centre, 50 acres for high rise flats and sites for a hospital, a college, churches, a secondary school, clubs and flats, as well as primary schools, parks and neighbourhood shops. 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 sub-divisions but associated with those already described involve main water supply and sewerage works and a bridge across the mouth of Rapid Creek.

3. The estimated cost of the work is \$10.76 million. The plan is to phase the work starting with the services for the Nakara and Wanguri neighbourhoods during 1970/71.

#### 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 Darwin, we took evidence from their representatives and from Mr. T.A. Bell, M.L.C.

5. We also inspected the sites for the proposed sub-divisions.

#### PREVIOUS ENQUIRIES

6. The Dripstone 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 where the only major urban development is now taking place and which comprises the neighbourhoods of Alawa, Jingili, Moil and Wagaman is well advanced. Casuarina, Dripstone and the future Sanderson district are located east of Rapid Creek and accord with the long term town planning for Darwin.

Each is planned to have four neighbourhood units of roughly the same dimensions producing about 2,400 residential and other lots.

7. The Committee has, since 1965, reported on the provision of engineering services to each of the four neighbourhoods of the Casuarina district, viz. Alawa, Jingili, Moil and Wagaman. 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), the extensions to Stokes Hill Power Station (1967) and sewerage augmentation (1969).

8. It is noteworthy that in the report on the Wagaman sub-division in 1969, the Committee commented that the timing of the sub-divisional development proposals was lagging behind demand and urged the Government to accelerate the land servicing programme so that it is more closely geared to the current rate of population increment. That report went on to state "... the Committee viewed with satisfaction the undertaking of the Northern Territory Administration witness that instead of referring each of the proposals for the engineering services for the four neighbourhood units of Dripstone to the Committee as separate references as was done with Casuarina, the development of the whole district is to be submitted as one reference. We believe this is a positive step which will not only allow the Northern Territory Administration considerably more flexibility in designing, programming and constructing their engineering services and housing proposals, but will permit much closer attention to be paid to the other factors which need to be considered in the broad development context." We were thus gratified that the Northern Territory Administration's undertaking given on that occasion has been fulfilled by referring the Dripstone development to the Committee as a whole.

DARWIN TOWN PLAN

9. 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 urban 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 nucleus of the neighbourhood is the primary school. The road system provides a system of sub-neighbourhoods designed about parks and linked by internal roads capable of taking public transport. The main internal roads lead to the school and community centre. The outer roads of each neighbourhood join to form a pattern of secondary roads collecting outward-bound traffic and delivering it to the arterial road system.
10. Each group of four neighbourhoods form a district, each of which in turn has a commercial centre, a high school, major parks, public utilities and other district services. A regional shopping centre is planned to service both Casuarina and Dripstone.
11. The town plan has been based on the use for urban purposes of vacant Crown land which is suitable for that purpose and is located north-east of the city beyond the R.A.A.F./Airport complex and east of Rapid Creek. This area can eventually provide six districts, the first of which is Casuarina, and is to be followed by Dripstone, Sanderson, Leanyer, Thorak and Holmes.
12. 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 Jingili, Moil and Wagaman. In relation to lot sizes,

they produce average lot dimensions of 8,000 sq. ft with frontages between 70 ft and 85 ft and a depth up to 110 ft depending on location within the overall layout.

13. The Committee were told that lots of these dimensions 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 provide adequate outdoor living space.

14. 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.

15. Shopping Facilities Besides the proposed commercial centre and the regional shopping centre, 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.

16. The Committee's Conclusion The Committee believe that it is appropriate that, in accordance with the approved town plan, for the District of Dripstone to be the site for the next stage of urban development in Darwin. As it is apparent that the principles of town planning design and engineering standards adopted for the development in Casuarina have been satisfactory, we agree that they should be repeated in Dripstone.

#### THE NEED

17. Population The references mentioned in paragraph 7 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, by count, some 7% over a 20 year period to 1966 and, by estimate, over 11% compound since then. At the 1966 census, the population count for the Greater Darwin area was 21,561 including about 800 Aborigines. At 30 June 1969, it was estimated that the figure had grown to 30,150.

18. A recent study on the growth of Darwin concluded that the population could be expected to increase at a rate of not less than 10% per year until 1975. This would mean a population of at least 53,000, an increase of some 20,000 in the next five years. The Committee noted that most of these people would need to be housed in the remainder of the Casuarina district and in Dripstone even though greater use of flats might be expected in older areas of Darwin and some increase in private sub-divisions may occur.

19. 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 not only that there is a continuing heavy demand for serviced residential blocks, but also that the rate of demand itself is growing.

20. The housing waiting list for employees of the Commonwealth in the Northern Territory has grown from 92 to 228 in the four years since 1966, despite 967 allocations during the period. The average waiting time is now 12 months. On the question of the provision of Government housing, the Committee noted with interest that through the unavailability of other serviced residential land, the R.A.A.F. and the Navy have been forced to develop building lots within their own reserves for their married members.



21. 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 1970 the waiting list had been reduced to 569 following an exceptionally heavy run of allocations. New applications are received at a rate of up to 80 per month and the waiting time for a flat is 11 months and for a house seven months.

22. 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 scarcity of land in a well developed market. At sales of 319 lots over the last three years, premiums have ranged as high as \$11,325.

23. The large unsatisfied demand among those wishing to build their own homes has stimulated the development for residential purposes of privately owned or leased land. Although over 400 lots have become available in this way in the last 3/4 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 serviced in Dripstone.

24. As noted in the report on the Wagaman proposal, more and more people are forced to live permanently in caravans located not only in caravan parks, but also in backyards or under houses. In 1966, 169 persons were living permanently in three caravan parks and by May 1970, there were 11 parks accommodating 950 people.

25. The Government's programme for land servicing allows for 1,038 lots to be commenced in 1969/70 and 1,174 in 1970/71. However, only 601 lots are expected to be turned off for the commencement of housing construction in

1969/70 of which 212 will be for government housing, 334 for Housing Commission, 35 for public auction, 14 for special purposes with 6 carried forward to the following year. In 1970/71, about 807 lots are planned to be available for housing construction, 238 for government housing, 320 for Housing Commission and 249 for disposal at auction for private housing.

26. 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 District of Dripstone.

#### DESIGN OF DRIPSTONE DISTRICT

27. Generally, it is proposed that the designs for Dripstone will be similar to those followed for the neighbourhood units in the Casuarina district. The principles of town planning design affecting road layout and lot dimensions discussed in paragraphs 9 to 14 above are being adopted. The area of the district will be broadly of the same dimensions providing, in this instance, 2,344 residential lots and 82 special sites.

28. Shopping and Commercial Facilities The servicing of the regional shopping centre site in the south-east corner of Nakara was completed along with the Moil neighbourhood unit. A lease for development of the centre has recently been granted requiring that buildings valued at a minimum of \$4 million be completed within seven years. However, as part of this reference, provision will be made for a small group of shops in each neighbourhood, generally near the central park, to cater for the minor family needs.

29. Adjacent to the regional shopping centre, a 30-acre commercial centre will provide for a post office, a public library, a bus terminal, business premises, Housing Commission offices and decentralised Government offices.

30. Within the district, water will be reticulated in either cast iron cement lined pipes or asbestos cement pipes located generally within the footpath reservation. Water for fire protection will be delivered from 2½ in. diameter millcocks on standpipes at appropriate points.

31. Water supply works in this reference to be constructed outside the district include the provision of additional pumps at the McMinn's pumping station 19 miles from Darwin. These pumps are required to increase the pumping capacity of the station from 10 to 20 million gallons per day. The expansion of the water source for Darwin is being implemented by the construction of the Darwin River dam and associated works. The McMinn's pumping station is an integral part of the reticulation system from this and other supply sources.

32. Sewerage The neighbourhood unit of Wanguri will discharge sewage directly to the northern zone trunk sewer whilst the southern areas of Brinkin and Nakara will drain by gravity to the Lakeside Drive pumping station under construction near Rapid Creek and thence by rising main into the main trunk sewer to the northern zone treatment works at Leanyer Swamp. The northern areas of Brinkin and Nakara as well as Tiwi will drain by gravity to a new pumping station near the Tiwi neighbourhood and thence into the northern zone trunk sewer. The latter pumping station is part of this reference.

33. Within the sub-divisions sewerage will be reticulated in a system of varying sized mains with concrete manholes. Sewers will be laid mainly at the rear of blocks to minimise the length of connections.

34. 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 which is due to be in use in 1971. Street lighting will comprise sodium lanterns on main traffic routes and twin 20 watt fluorescent lights in minor streets.

35. Roads and Footpaths 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 eastern perimeter of Wanguri, the first half of Lee Point Road will be constructed 36 ft wide as will the northern and southern boundary roads. In the case of Vanderlin Drive, this will be the second half of dual 36 ft carriageways separating Wanguri and Wagaman.

36. The present 36 ft carriageways of Trower Road will extend past the commercial centre to the commencement of Tiwi where it will become dual 24 ft carriageways and continue into Casuarina Drive along the western perimeter and southerly across the mouth of Rapid Creek via a dual two-lane bridge. Dual 24 ft carriageways will also be provided from Trower Road around the western side of the commercial centre. Dripstone Road, along the southern side of Brinkin, the Tiwi perimeter road and the boundary road between Brinkin and Nakara will be 38 ft wide. Neighbourhood distributor roads will be 34 ft wide and other internal roads 24 ft wide.

37. Roads carrying higher density traffic are to be surfaced with 1 in. of bituminous concrete. Minor roads will be provided with bitumen flush surface seals. Footpaths will be surfaced with bituminous concrete.

38. Stormwater Drainage Stormwater will be directed by kerb and gutters into side entry pits at intervals along the roads and conveyed by underground pipe systems throughout the neighbourhoods.

39. Committee's Conclusion Subject to the reservation in paragraph 49 the Committee recommend the construction of the work in this reference.

ESTIMATE OF COST

40. The estimated cost of the work when referred to the Committee was \$10.76 million made up as follows:

	\$
Roads, footpaths and stormwater drainage	6,655,000
Water supply	1,015,000
Sewerage	890,000
Electricity supply	975,000
Bridge, parks etc.	465,000
External services	760,000
	<hr/>
	10,760,000
	<hr/>

PROGRAMME

41. The Committee were informed that it is proposed to phase construction in the light of actual requirements and in accordance with the level of funds available. We noted, furthermore, the funds have been allocated in the 1970/71 Civil Works Programme for commencements to be made on the internal services to both the Nakara and Wanguri sub-divisions as well as the external sewerage and water supply services.

42. Subject to an early approval to proceed being given, it is expected that designs and documentation for the Nakara sub-division will be completed in November 1970 and for Wanguri, by April 1971. Documentation time for Brinkin and Tiwi, when required, will be approximately six months.

43. The construction of each neighbourhood is expected to take two years after a contract is let.

OTHER OBSERVATIONS

44. Arterial Roads The Committee, in reporting on the Jingili, Moil and Wagaman proposals were critical of the tardiness of the planning of the arterial road system and in particular the connections between the city area and the north-eastern districts of Nightcliff and Casuarina.

45. Since 1967, the Commonwealth has accepted responsibility for the construction of nominated main roads in Darwin and as a result Bagot Road between the Stuart Highway and Nightcliff has now been reconstructed with dual carriageways. It is noted, furthermore, that the construction of Stuart Highway between Bagot Road and Stuart Park in dual carriageways is programmed for commencement in 1970/71.

46. We have now been told that a private consultant has reported to the Government on the overall development of the arterial road system in Darwin and that a further submission to the Committee may be expected shortly on this subject. In dealing with the present reference, the Northern Territory Administration witness forecast that the proposed arterial roads will broadly follow the provisions already made in the town plan.

47. Bridge over Rapid Creek As a link in the arterial road system, the work in the present reference includes an extension of Casuarina Drive on the western side of Brinkin, southwards to Rapid Creek, and a bridge over Rapid Creek to connect, through Nightcliff, either with Bagot Road or with the projected Palmerston Freeway to give access to the city. The bridge is therefore an important arterial access to and from the western part of Dripstone.

48. Consideration has been given for some time to the treatment of Rapid Creek where it adjoins Alawa and Brinkin on the eastern bank and the suburb of Rapid Creek to the west and from the crossing of the creek at

Trower Road to its mouth. The creek is tidal and in the area described is virtually a swamp. One suggestion is that by controlling the entry of water into the creek and cleaning it out, a lake/water feature could be created for recreation and similar purposes.

49. A means of controlling the level of water in the lake would be the construction of a weir at the mouth of the creek. The point of the Committee raising the matter here is to suggest that the design of the bridge over Rapid Creek at its mouth should not be finalised until a decision is taken on the future treatment of the Rapid Creek swamp because of the possibility of the construction of a combined bridge and weir. In expressing this view, we are conscious of the necessity for an early decision to be made because of the importance of the bridge in the developing arterial road network.

#### 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 DRIPSTONE TO BE THE SITE FOR THE NEXT STAGE OF URBAN DEVELOPMENT IN DARWIN.	16
2.	THE PRINCIPLES OF TOWN PLANNING DESIGN AND ENGINEERING STANDARDS ADOPTED FOR THE DEVELOPMENT IN CASUARINA SHOULD BE REPEATED IN DRIPSTONE.	16
3.	THERE IS A CONTINUING REQUIREMENT FOR SERVICED RESIDENTIAL LAND IN DARWIN.	26

	<u>Paragraph</u>
4. THERE IS A NEED FOR THE PROPOSED ENGINEERING SERVICES TO BE PROVIDED IN THE DISTRICT OF DRIPSTONE.	26
5. SUBJECT TO THE RESERVATION IN PARAGRAPH 49 THE COMMITTEE RECOMMEND THE CONSTRUCTION OF THE WORK IN THIS REFERENCE.	39
6. THE ESTIMATED COST OF THE WORK WHEN REFERRED TO THE COMMITTEE WAS \$10.76 MILLION.	40
7. THE DESIGN OF THE BRIDGE OVER RAPID CREEK AT ITS MOUTH SHOULD NOT BE FINALISED UNTIL A DECISION IS TAKEN ON THE FUTURE TREATMENT OF THE RAPID CREEK SWAMP.	49

  
(C.R. KELLY)  
Chairman.

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

17 September 1970.