PUBLIC ENVIRONMENTAL REVIEW

SOUTHERN RIVER BRIDGE PROJECT

FOR

GOSNELLS CITY COUNCIL

CMPS&F Pty Limited
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INVITATION

The Environmental Protection Authority (EPA) invites people to make a submission on this proposal.

The Public Environmental Review (PER) proposes the construction of a bridge and associated roadworks at the intersection of Spencer Road and Corfield Street, Huntingdale.

Following receipt of comments from government agencies and the public, the EPA will prepare an assessment report with recommendations to the Government, taking into account issues raised in public submissions.

Why write a submission?

A submission is a way to provide information, express your opinion and put forward your suggested course of action - including any alternative approach. It is useful if you indicate any suggestions you have to improve the proposal.

All submissions received by the EPA will be acknowledged. Submissions will be treated as public documents and may be quoted in full or in part in each report unless specifically marked "confidential".

Why not join a group?

If you prefer not to write your own comments, it may be worthwhile joining with a group or other groups interested in making a submission on similar issues. Joint submissions may help to reduce the workload for an individual or group, as well as increase the pool of ideas and information. If you form a small group (up to 10 people), please indicate all the names of the participants. If your group is larger, please indicate how many people your submission represents.

Developing a submission

You may agree or disagree with, or comment on, the general issues discussed in the PER or the specific proposals. It helps if you give reasons for your conclusions, supported by relevant data. You may make an important contribution by suggesting ways to make the proposal environmentally more acceptable.

When making comments on specific proposals in the PER:

- clearly state your point of view;
- indicate the source of your information or argument if this is applicable;
- suggest recommendations, safeguards or alternatives

- This has been brought about by requirements of the Freedom of Information procedures.

By keeping the following points in mind, you will make it easier for your submission to be analysed:

- attempt to list points so that issues raised are clear. A summary of your submission is helpful;
- refer each point to the appropriate section, chapter or recommendation in the PER;
- if you discuss different sections of the PER, keep them distinct and separate, so there is no confusion as to which section you are considering;
- attach any factual information you may wish to provide and give details of the source. Make sure your information is accurate.

Remember to include:

- your name;
- address;
- date and
- whether you want your submission to be confidential.

The closing date for submission is Tuesday 21 June 1994.

Submissions should be addressed to:

The Environmental Protection Authority
Westralia Square
141 St George's Terrace
PERTH WA 6000

ATTENTION: Garry Middle

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Project: This Public Environmental Review has been prepared to assess the need for and impact of the proposed road realignment and new bridge for the Southern River Bridge Project.

Need for the Project: The existing two-lane timber bridge has insufficient capacity for future traffic. The new bridge and road realignment (of four lane dual carriageways) will provide the necessary capacity and increase safety.

The higher profile of the bridge deck will also enhance the rejuvenation of the vegetation of the floodplain it traverses; as well as improving the movement corridor for animals resident in the river floodplain.

Environmental Effects: Although vegetation communities within the floodplain have been widely altered due to clearing and the introduction of exotic species, the area is a valuable fauna habitat.

The clearing of vegetation and placing of fill for abutments will require careful management to ensure that disturbance to existing vegetation and consequent erosion is minimised. This approach will also be important for minimising the impact of the project on the fauna of the area.

With the exception of one area where a slight increase will occur, traffic noise levels will be reduced. All noise levels are predicted to be less than the desired maximum level adjacent to residences.

Visual impacts will be negligible due to the realignment being at ground level and the bridge deck being well below the canopy of trees along the floodplain.

Aboriginal Heritage: No Aboriginal sites were located in the area surveyed. However, Aboriginal sites located within a 4 Km radius suggest that archaeological sites exist within the dense vegetation along the Southern River. The ethnographic survey indicated that important camping and fishing areas were located either side of the Southern River on the alignment of the new bridge.

Public Participation: The proponent conducted a public program of media releases, local area letter drops and a two week public display of the project.

Thirty seven public submissions were received of which thirty one favoured the project, four were against the project and two raised specific concerns. Some twelve matters were raised by various submissions and these have been incorporated in commitments of the Proponent where possible and practical.

Commitments: The Proponent has made a variety of management commitments associated with the detail design and construction of the project.

These commitments are intended to reduce erosion of the floodplain and embankments, to minimise degradation of the biological environment and the risk of pollution of the Southern River and; to protect areas of Aboriginal and ethnographic interest.

To further reduce noise impacts and headlight spill, landscaped barriers will be constructed in the reserves of specific residential streets.

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SECTION 1 - INTRODUCTION

1.1 PROPONENT AND RESPONSIBLE AUTHORITIES

This Public Environmental Review (PER) has been prepared to assess the impact of the proposed Bridge and road realignment for the Southern River Bridge Project. The proponent for the project is the Gosnells City Council.

Other responsible authorities include the Environmental Protection Authority (EPA), the Water Authority of Western Australia, the Waterways Commission, Department of Planning and Urban Development, Main Roads Western Australia and the WA Museum, Department of Aboriginal Sites.

1.2 BACKGROUND

1.2.1 General

The Southern River Bridge project area is situated within the City of Gosnells, some 13.5 km to the south-east of Perth's Central Business District. Figure 1.1 contains the Locality Plan. The project involves the replacement of the existing bridge over the Southern River on Fremantle Road, Gosnells, with a new four-lane dual carriageway bridge on a Spencer Road/Corfield Street alignment, upstream of the existing timber bridge. Fremantle Road will be extended south to intersect Corfield Street at a T-junction to be controlled by a two-lane circulatory flow roundabout. Figure 1.2 contains the conceptual plan of the proposed project.

1.2.2 History of Proposal

A Government Gazette, dated October 1970 is the first record detailing suggestions that Corfield Street should be widened to a 30 metre road reserve with a connection through to Spencer Road.

Following that gazettal Gosnells City Council began to acquire land on the western side of Corfield Street, with Council currently negotiating the purchase of the remaining parcels of land which are required for the project.

In the mid to late 1970's Council initiated a Guided Town Planning Scheme (TPS No 10) for a large parcel of land primarily to the west of Corfield Street. The widening of Corfield Street was incorporated as a scheme requirement. The scheme called for public submissions. There were no objections to the widening of Corfield Street and subsequently the scheme was granted approval by the Minister for Town Planning in April 1981.

In early to mid 1992, Council resolved to initiate a bridge design for the connection of Corfield Street and Spencer Road. Plans were advertised in the "Comment News" on 2nd and 9th June 1992 and on both occasions Council asked for written comments. Seven written submissions were received; six supported the proposal. The proposal was then submitted to the EPA to determine the level of assessment required.

1.3 THE PER AND THE ENVIRONMENTAL PROCESS

A Public Environmental Review (PER) level of assessment has been requested by the EPA in order to enable the Authority to assess the possible environmental implications linked with the construction of the proposed Southern River Bridge Project. The PER has the following objectives:

- To address environmental, social and conservation/heritage issues and impacts
- For each impact, describe any environmental management steps the proponent believes would avoid, mitigate or ameliorate that impact
- To place this project in the context of the regional environment
- To explain the issues and decisions which lead to the choice of this project at this place at this time
- To promote public understanding of the proposal and to facilitate public comment via a public participation exercise which involves a public exhibition, and
- To provide a mechanism whereby public authorities and the general public can raise environmental/social/conservation and heritage issues.

The PER is publicly accessible for a period of eight weeks within which time submissions can be made to the EPA. Once the public review period has ended the comments submitted by the public and other interest groups will be forwarded to the proponent, Gosnells City Council.

EPA guidelines for the Public Environmental Review are contained in Appendix A.

The proponent will provide written responses to any issues raised. The EPA will then prepare an Assessment Report which will provide advice and recommendations to the Minister of the Environment as to the acceptability of the proposal and the conditions which should apply. The public and other interest groups at this time may lodge an appeal in relation to the recommendations/advice given within the EPA's assessment report. The Minister will then determine any appeals and will inform the proponents whether the proposed Southern River Bridge project is acceptable and the conditions, if any, which should apply to the project.

The PER is prepared to provide a clear understandable description of the proposal, its background, the potential environmental, social, conservation and heritage impacts and the management strategies that will be implemented to minimise these impacts.

The main body of the PER is contained in nine sections these being:

1. Introduction

2. Description of Development

3. Need for Development

4. Assessment of Alternatives

5. Description of Site

6. Environmental Issues

7. Aboriginal Issues

8. Public Participation Programme

9. Commitments

1.4 BRIEF DETAIL OF SCOPE AND TIMING OF WORKS

The scope of the proposal embraces approximately a 5.0 hectare site within the City of Gosnells. Figure 1.2 details the project area.

It is intended by the proponent to complete the approval processes for development during 1994 and commence construction in 1995. Figure 1.3 details the history and timing of the entire project.

1.5 RELEVANT STATUTORY REQUIREMENTS AND APPROVALS

The site development project will be under the control of the proponent, Gosnells City Council, empowered by the Local Government Act 1960.

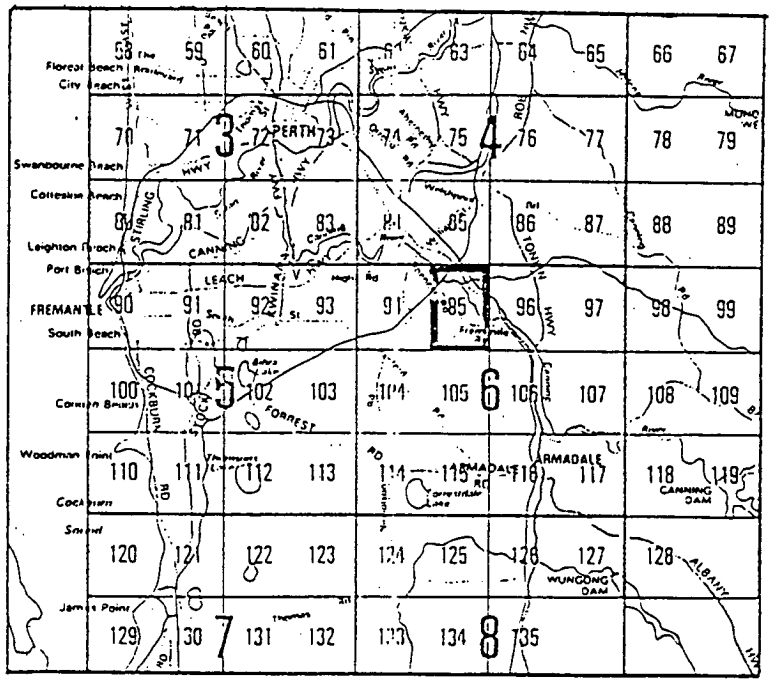
The proposal for bridge development and road realignment works is subject to the Environmental Impact Assessment (EIA) process under the Environmental Protection Act 1986.

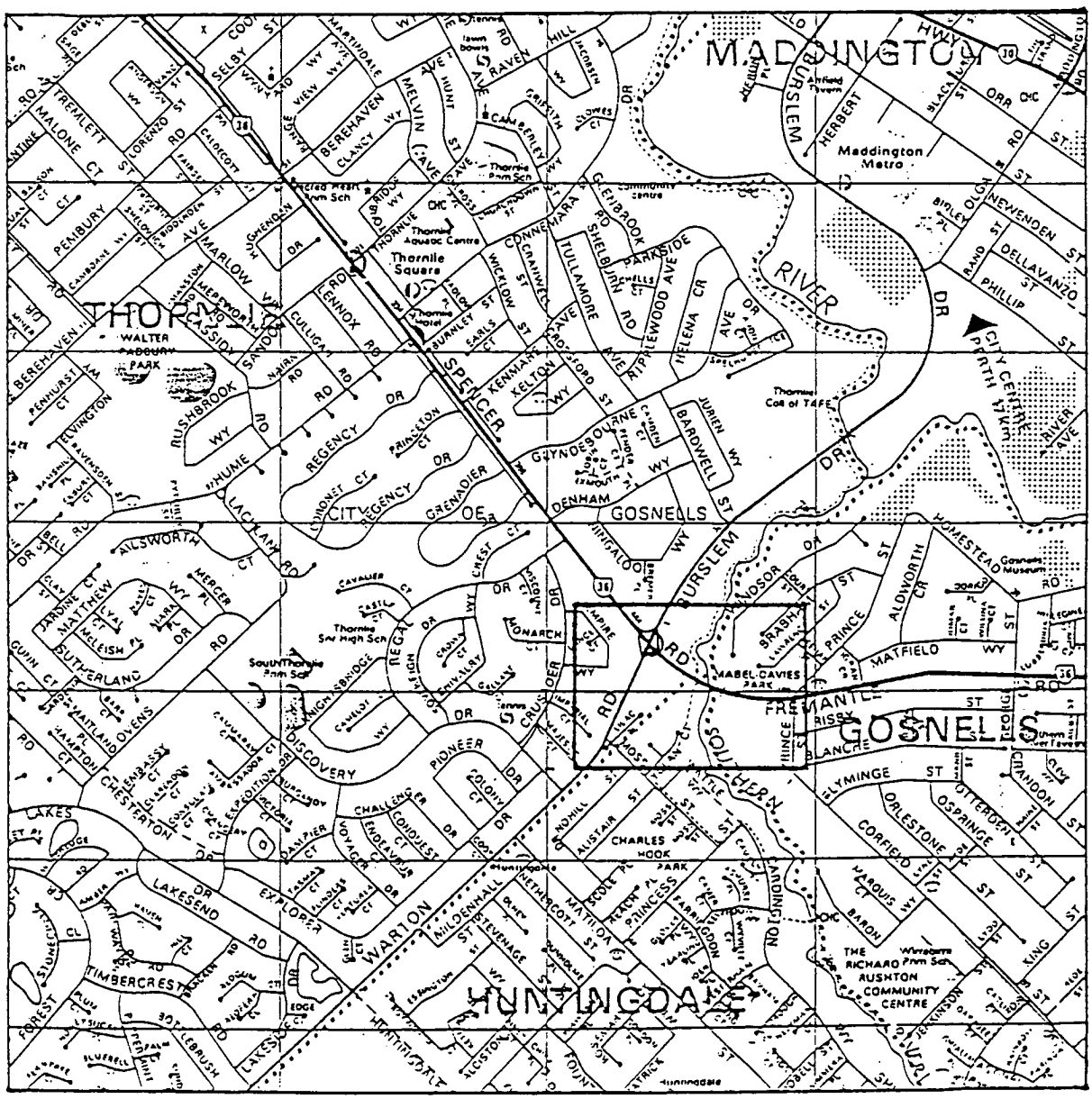
In addition, the proposed development will also be subject to the control of other relevant statutory authorities under appropriate legislation namely:

- Water Authority Act 1984
- Aboriginal Heritage Act 1972 – 1980
- Waterways Conservation Act 1976
- Swan River Trust Act 1988
- Main Roads Act 1938
  Act amended (Public Service Act 113, 1987)
- Wildlife Conservation Act

FIGURE 1.1

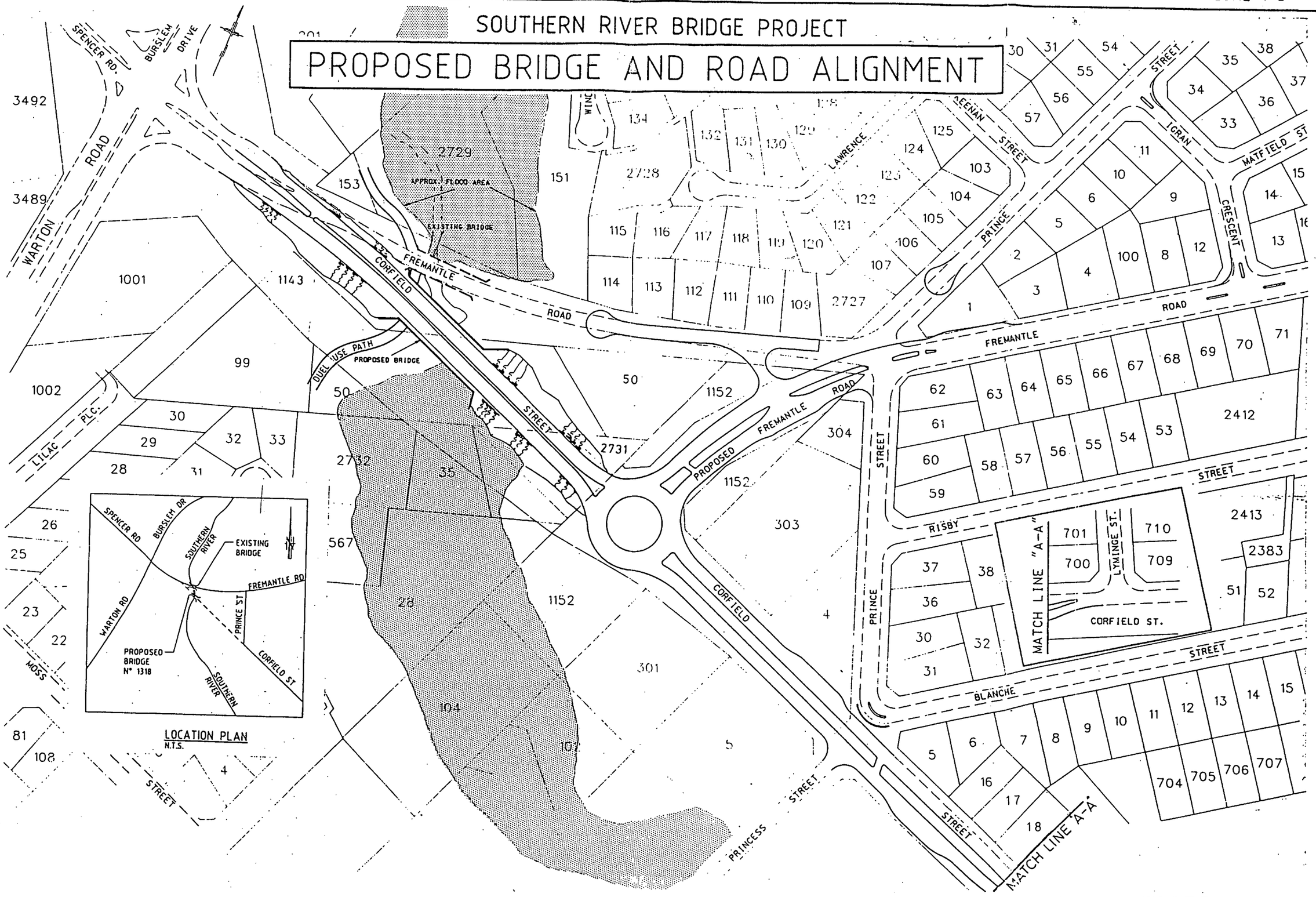
LOCALITY PLAN
OF PROPOSED
DEVELOPMENT





SOUTHERN RIVER BRIDGE PROJECT

PROPOSED BRIDGE AND ROAD ALIGNMENT



LOCATION PLAN
N.T.S.

DISPLAY 2

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FIGURE 1·3
TIMING OF PROJECT

No.	TASK	1991				1992				1993				1994				1995			
		JAN.-MAR.	APR.-JUN.	JUL.-SEP.	OCT.-DEC.	JAN.-MAR.	APR.-JUN.	JUL.-SEP.	OCT.-DEC.	JAN.-MAR.	APR.-JUN.	JUL.-SEP.	OCT.-DEC.	JAN.-MAR.	APR.-JUN.	JUL.-SEP.	OCT.-DEC.	JAN.-MAR.	APR.-JUN.	JUL.-SEP.	OCT.-DEC.
1	DETERMINE ALIGNMENT																				
2	DETERMINE ROAD PATTERN																				
3	ENVIRONMENTAL CATEGORISATION																				
4	PRELIMINARY PLAN TO SWAN																				
	RIVER TRUST FOR COMMENT																				
5	DEVELOPMENT APPLICATION TO DPUD																				
	FOR APPROVAL																				
6	ENVIRONMENTAL STUDIES																				
7	PREPARE CONCEPT PLANS OF BRIDGE																				
	AND ASSOCIATED ROADWORKS																				
8	LAND ACQUISITION																				
9	PUBLIC ENVIRONMENTAL REVIEW																				
	SELECT CONSULTANT																				
	DATA COLLECTION																				
	PUBLIC DISPLAY																				
	DRAFT PER																				
	PUBLIC REVIEW THROUGH EPA																				
	EPA ASSESSMENT AND DECISION																				
10	ARRANGE FUNDING																				
11	DETAILED INVESTIGATION																				
	AND DESIGN																				
12	BRIDGE CONSTRUCTION																				
13	ROAD CONSTRUCTION																				

REV.	DATE	DESCRIPTION

LEGEND

EXISTING MANHOLES	NEW PIPES R.M.S	P.M.G. POLE
NEW MANHOLES	NEW PIPES L.M.S.	W.A. VALVE
EXISTING GULLIES	EXISTING PIPES	LIMIT OF WORK
NEW GULLIES	ROAD CENTRE LINE	
EXISTING PIPES	HYDRANT	
NEW PIPES	GAS PIPE	
EXISTING KERBS	S.E.C. POWER POLES	
NEW KERBS	S.E.C. POWER LINES	
FUTURE KERB LINE	OPEN UNLINED DRAIN	
EXISTING ROAD EDGE	P.M.G. PIT	

CITY OF GOSNELLS

ALBANY HIGHWAY/HILLS ROAD
GOSNELLS

F.B. No.
L.B. No.
DATUM: A.H.D.
JOB No.:

SOUTHERN RIVER BRIDGE

SPENCER RD./CORFIELD ST. ALIGNMENT
PRECONSTRUCTION PLANNING CHART

DESIGN: I.L.C. | DRAWN: J.W.L.B. | SCALE: N.T.S.
SURVEY: | CHK.: | DATE: 11·8·93

PLAN No.
G/S61

SHEET No.: 1 of 1

CITY ENGINEER
I.L. CAMPBELL

SECTION 2 – DESCRIPTION OF DEVELOPMENT

SECTION 2 - DESCRIPTION OF DEVELOPMENT

2.1 BRIDGE AND ROAD LAYOUT

The proposed Southern River Bridge development consists of a three span bridge, with two 17.65 metre long approach spans and a single 18 metre long central span. This span was approved by the Water Authority of Western Australia. The bridge will have an overall width of 20.65 metres, comprising a four–lane dual carriageway and a dual use path along its southern margin.

Spencer Road and Corfield Street will be extended and widened to cater for a four–lane dual carriageway which commences at the junction of Spencer/Warton Road and extends across the proposed Southern River Bridge to the intersection of Corfield and Lyminge Streets. The existing Fremantle Road will be widened and realigned in a southerly direction from the intersection of Prince Street to a proposed T–junction intersection located along the extended section of Corfield Street. The intersection will be controlled by a two–lane circulatory flow roundabout. The realigned section of Fremantle Road will be four–lane dual carriageway.

The existing section of Fremantle Road to the west of the Prince Street intersection will be a cul–de–sac, access will be via the extended section of Fremantle Road. Figure 1.2 depicts the conceptual road realignment design.

The old bridge will be maintained as long as is economically viable for pedestrian and cyclist access.

2.2 BRIDGE CONSTRUCTION

The superstructure will consist of precast concrete beams and an insitu reinforced concrete deck slab. The deck is continuous over the supports. The substructure at each of the abutments will comprise of reinforced concrete cap beam supported on driven concrete piles.

The substructure at the pier will consist of approximately 750 mm–diameter reinforced concrete columns supported on pile caps and driven concrete piles.

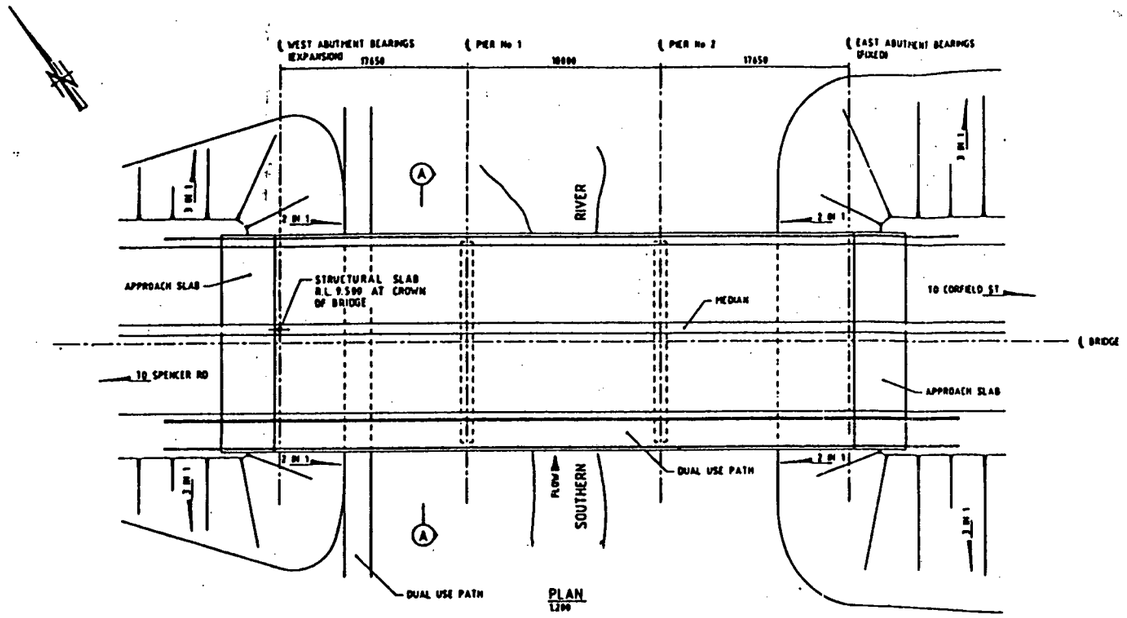
Figure 2.1 depicts a cross–section of the bridge with construction detail.

2.3 EMBANKMENT CONFIGURATION

The embankments situated at each end of the approach spans will extend from the upper river terrace, partially onto the floodfringe on both sides of the river. Each embankment will be constructed with compacted sand fill and landscaped with topsoil and trees. The surface will be stabilised to provide protection against erosion. A dual use path will run along the base of the western embankment. The path will reconnect the existing path which runs along the western terrace of the Southern River, either side of the proposed bridge.

SOUTHERN RIVER BRIDGE PROJECT

PROPOSED BRIDGE LAYOUT



PLAN
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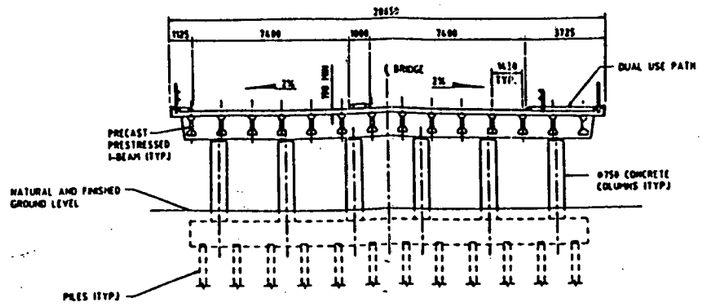

SECTION (A)
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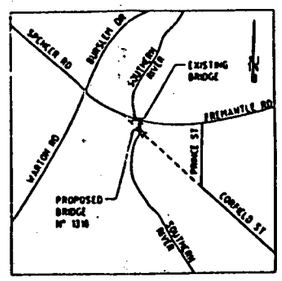
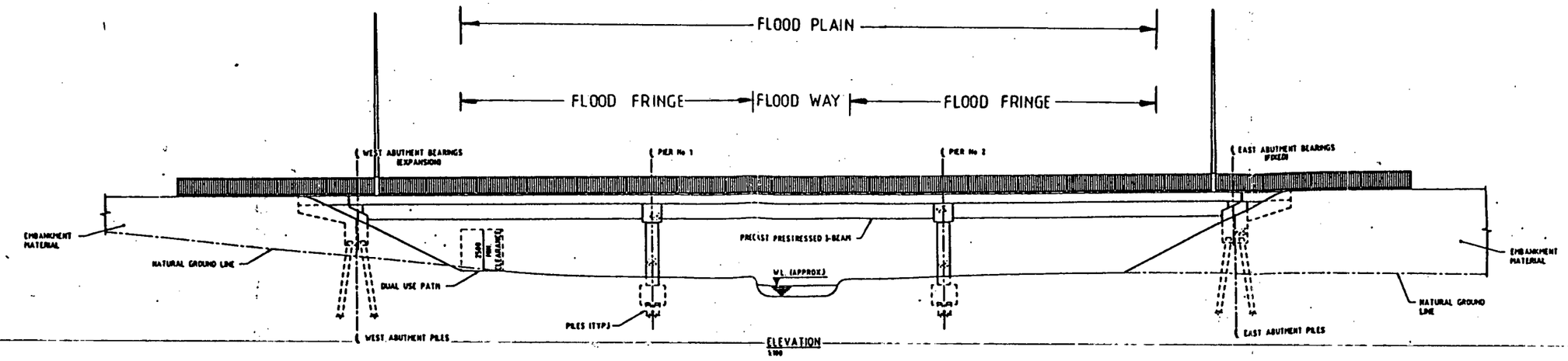


LOCATION PLAN
N.T.S.



ELEVATION
1:100

DISPLAY 5

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SECTION 3 – NEED FOR DEVELOPMENT

3.1 INTRODUCTION

Present and future residential land development to the south–east of the proposed Southern River Bridge, along Corfield Street, will result in a continued increase in traffic volumes.

The current dual lane timber bridge along Fremantle Road does not have sufficient capacity for projected traffic volumes, consequently a new bridge is required to alleviate present traffic problems in the area.

3.2 ADVANTAGES OF THE PROJECT

Major benefits resulting from the proposed development include:–

- General upgrade of the south eastern road corridor.
- The construction of a four–lane dual carriageway over the Southern River will cater for projected increases in traffic volumes within the Gosnells area. Increased traffic volumes will be generated by continued residential development within the Gosnells City area and typically includes a large parcel of land at the southern end of Corfield Street which has been earmarked for future residential development. Table 3.1 details Projected Traffic Volumes for the proposed development.
- Reduce vehicle accidents and improve safety for pedestrian and cyclists.
- The raised carriageway above the floodplain will enhance the likelihood of vegetation rejuvenation across the floodplain. It will also provide greater corridors for animal movement and minimise disturbances to sensitive ethnographic sites directly below the proposed bridge, once construction is complete.

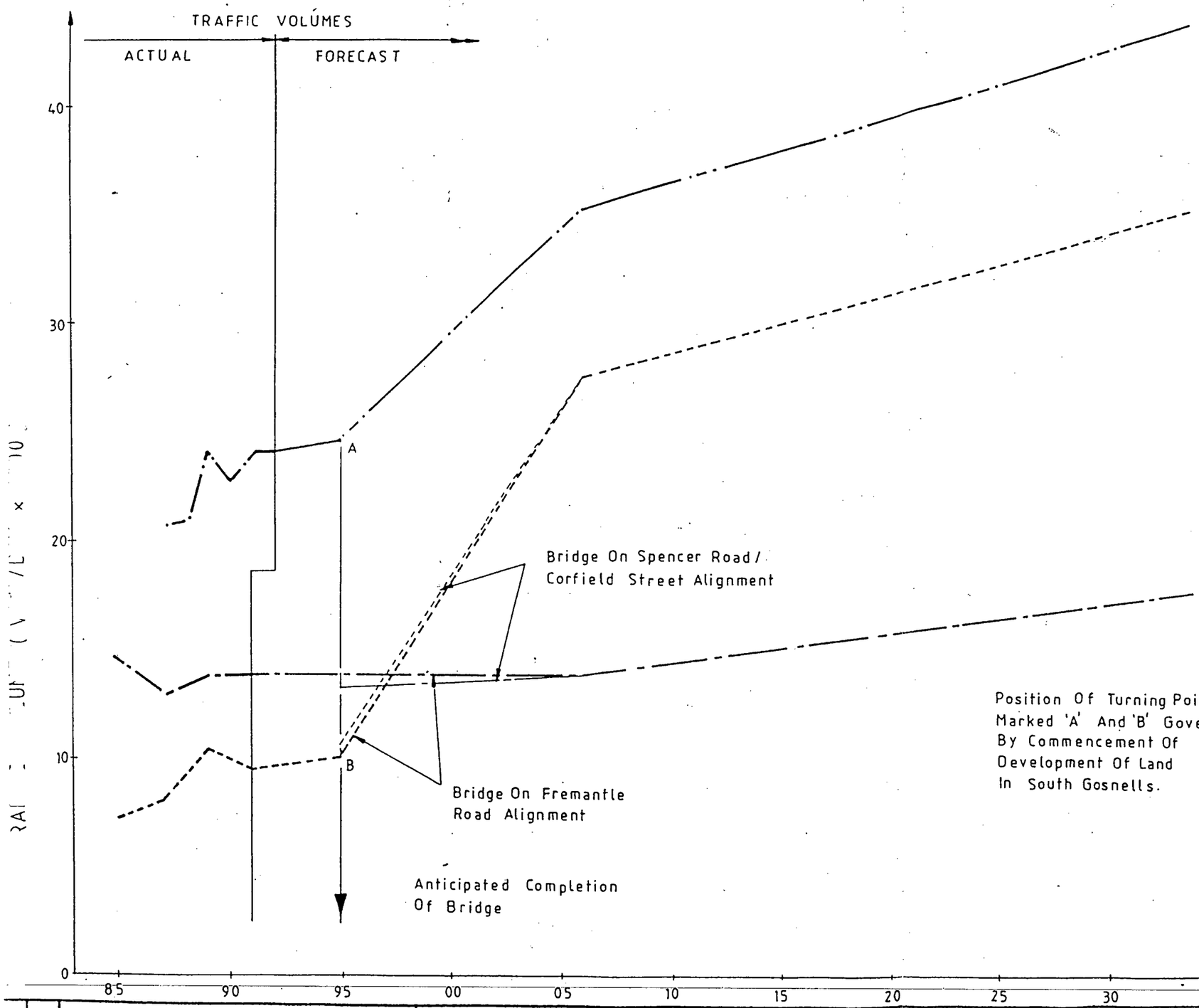
TABLE 3.1 – EXISTING PREDICTED TRAFFIC VOLUMES

LOCATION	EXISTING TRAFFIC VOLUME vpd	FORECAST TRAFFIC VOLUME Yr 1995 vpd	FORECAST TRAFFIC VOLUME Yr 2006 vpd	FORECAST TRAFFIC VOLUME Yr 2034 vpd
Spencer Road at new bridge site	24,000	24,800	35,500	44,100
Fremantle Road near Corfield Street	14,300	10,400	10,400	17,600
Corfield Street near Fremantle Road	9,000	10,2800	27,600	35,300

In the 10 year period 1995 – 2005 it is forecasted there will be a significant increase in traffic volumes along Spencer Road and Corfield Street. These increases signify the acceleration of residential development to the south east of the proposed development.

Figure 3.1 depicts traffic forecast data detailed in Table 3.1 in line graph format, highlighting the change in traffic volumes post 1995.

FIGURE 3·1
TRAFFIC FORECASTS



Spencer Road
(At Southern River Bridge)

Corfield Street
(South East Of Prince Street)

Fremantle Road
(East Of Prince Street)

Position Of Turning Points
Marked 'A' And 'B' Governed
By Commencement Of
Development Of Land
In South Gosnells.

The Graph Shows Traffic Forecasts For The Current Road Configuration. The Effect Of Locating The Bridge On The Spencer Road/Corfield Street Alignment Is That An Estimated 500 vpd Will Transfer From Fremantle Road Onto Corfield Street.

GENERAL NOTES

1. THIS DRAWING ALWAYS REMAINS THE PROPERTY OF THE CITY OF GOSNELLS AND MUST NOT BE RETAINED OR REPRODUCED WITHOUT PERMISSION.
2. IN ABSENCE OF THE APPROVED SIGNATURE (i.e. CITY ENGINEER OR HIS DEPUTY) THIS DRAWING SHALL BE TREATED AS PRELIMINARY.

DATE	DESCRIPTION

CITY OF GOSNELLS
2120 ALBANY HIGHWAY
GOSNELLS 6110
TEL:3980222 FAX No.3982922

SOUTHERN RIVER BRIDGE PROJECT – TRAFFIC FORECASTS

DATUM	DATE 14/12/92	JOB No.	SCALE H. 1: V. 1:	DESIGN	DRAWN L.N.N	CHK.

PLAN No. G/S 60
SHEET OF

CITY ENGINEER
I.L. CAMPBELL

SECTION 4 – ASSESSMENT OF ALTERNATIVES

SECTION 4 – ASSESSMENT OF ALTERNATIVES

4.1 INTRODUCTION

Current and future residential development to the south east of Corfield Street and associated feeder streets will result in a continued increase in volumes of traffic along Corfield Street.

Presently to access Corfield Street from the north, vehicles travel along Fremantle Road and Prince Street. The existing dual lane timber bridge along Fremantle Road and Prince Street do not have sufficient capacity required to meet the projected traffic volumes detailed in Table 3.1. Therefore a larger bridge and associated road works is required.

4.2 ALTERNATIVES

Two proposed alternatives to the existing bridge and road layout were assessed, these being:

(1) A new four–lane dual carriageway bridge aligned with Spencer Road and Fremantle Road, and as shown on Figure 4.1.

(2) A new four–lane dual carriageway bridge aligned with Spencer Road and Corfield Street, upstream of alternative (1). As shown on Figure 4.2.

Although a new bridge alignment with Fremantle Road, i.e. on a similar alignment to the existing timber bridge (Alternative 1), would meet predicted traffic volume capacity along Fremantle Road, it would not be able to accommodate forecast traffic volumes along Corfield Street. This alternative would require traffic on Fremantle Road to travel via Prince Street for direct access onto Corfield Street, resulting in unnecessary flow restriction at the junction of Fremantle Road and Prince Streets and a significant increase in traffic volumes and subsequent noise along Prince Street.

A new bridge alignment with Corfield Street (Alternative 2) meets the projected traffic volume increases generated by residential development to the south east. The Corfield Street alignment will allow for direct traffic flow into Spencer Road and Fremantle Road via the circulatory roundabout, alleviating unnecessary congestion, and noise along Prince Street.

4.3 INTERSECTION ALTERNATIVES

Three traffic intersection alternatives for Corfield Street/Fremantle Road were evaluated in terms of vehicle delay. The three alternatives included:

(1) Channelised – a 'traffic calming' measure effected by constructing curbs and/or median strips

(2) Signalised, and (Figure 4.1)

(3) Roundabout (Figure 1.2, 4.2).

Traffic delay times were determined for both AM and PM peak periods based on predicted traffic volumes detailed in Table 3.1. The table below depicts intersection alternatives in relation to vehicle delay.

TABLE 3.1

ALTERNATIVE	AM PEAK	PM PEAK
(1) Channelised	Not applicable for volume of traffic	
(2) Signalised	16.0 sec	16.5 sec
(3) Roundabout	4.0 sec	3.0 sec

The above table which has been ratified by the Main Roads WA clearly shows the roundabout alternative is the proper solution to the intersection equation.

In terms of accident prevention the right angle and head on conflicts would still be possible with the signalised option. With the roundabout option the only conflicts possible would be those of a far less hazardous merging nature. Both intersection types would incur a certain amount of rear end shunting conflicts however, the roundabout should reduce the amount due to a more efficient traffic flow.

FIG. 4·1 ALTERNATIVE 1

COREFIELD STREET / FREMANTLE ROAD INTERSECTION

SOUTHERN RIVER BRIDGE ON FREMANTLE ROAD ALIGNMENT

FREMANTLE ROAD

CORFIELD STREET

DURING FLOODS THE FLOW OF SOUTHERN RIVER AT THIS SECTION IS RESTRICTED BY AN EXISTING WATER MAIN AND POSSIBLY BY THE LIMITED OPENING OF THE EXISTING BRIDGE RESULTING TO THE BUILD UP OF DEBRIS.

CONSTRUCT THE NEW BRIDGE WITH SUFFICIENT OPENING ADEQUATE TO CARRY THE MAXIMUM VOLUME OF FLOOD FLOW UP TO 5.67 m/sec HIGH WATER LEVEL. THE STREAM BED SHOULD BE CLEARED OF DEBRIS 100 m UP STREAM AND 100 m DOWN STREAM.

COMBINED BUS BAY AND LEFT TURNING LANE

DEPRESSED MEDIAN OPENING

2.4 m PAINTED MEDIAN

P.I. NO. 2
Δ = 27° 30' 00" R
R = 200.000
T = 27.891
E = 1.208
L = 130.900

EQUATION
CH 0 = 495 CORFIELD STREET
CH 1 = 670 FREMANTLE ROAD

Public Recreation

A 32909
24709
Public Recreation

A 33643
2729
Public Recreation

SPENCER

EMPIRE WAY

WARTON

ROAD

WINDSOR

DRIVE

BRABHAM

STREET

LAWRENCE

MATFIELD

ALDERSYTH CRESCENT

RISBY

BLANCHE

BLEAN

MANDY

OSPRINGE

ORLESTONE

YULAN CT

COURT

MOSS

WATTLE WAY

DANOHILL

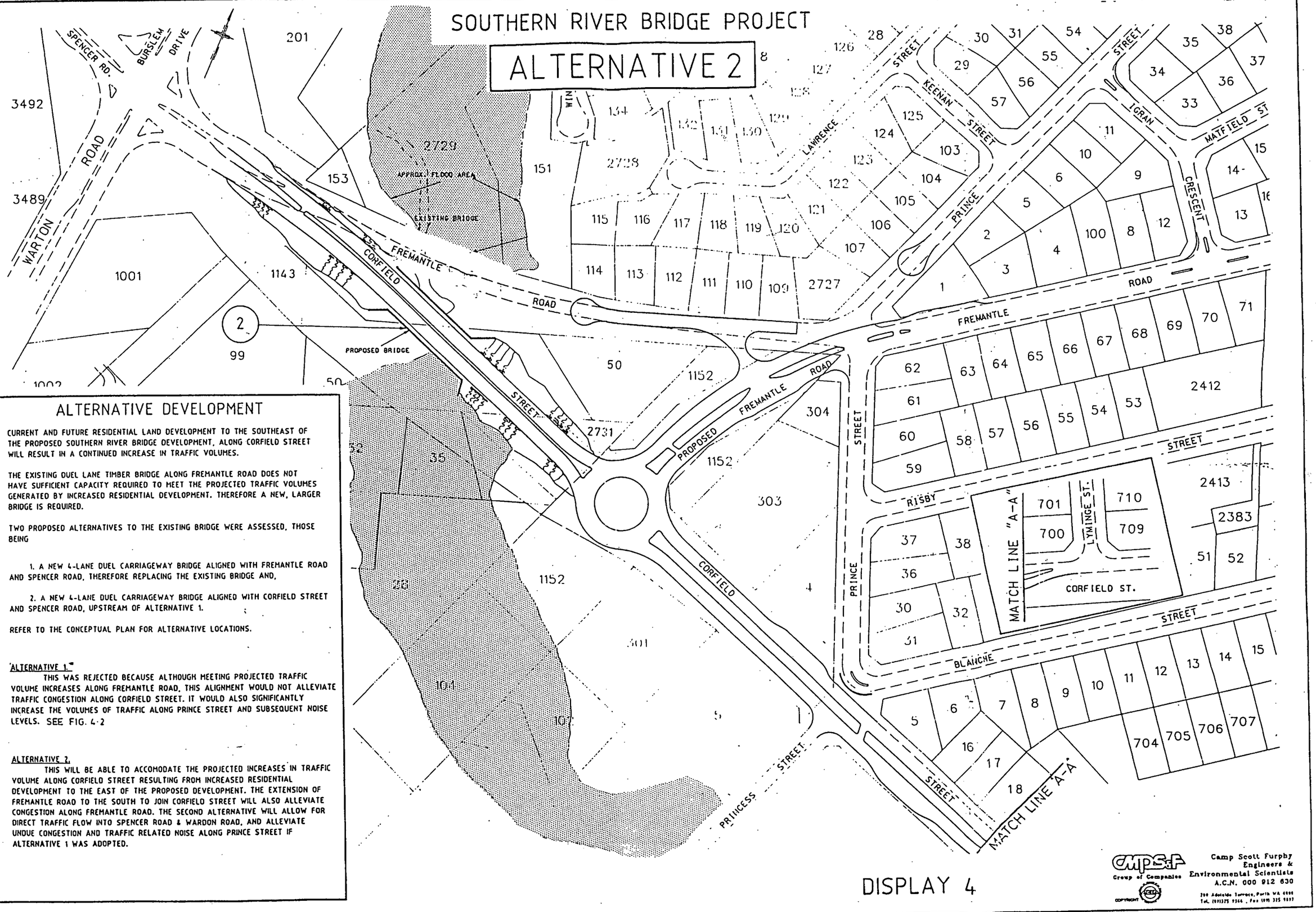
ALLISTAIR

PRINCESS

Preliminary Plan only

SOUTHERN RIVER BRIDGE PROJECT

ALTERNATIVE 2



ALTERNATIVE DEVELOPMENT

CURRENT AND FUTURE RESIDENTIAL LAND DEVELOPMENT TO THE SOUTHEAST OF THE PROPOSED SOUTHERN RIVER BRIDGE DEVELOPMENT, ALONG CORFIELD STREET WILL RESULT IN A CONTINUED INCREASE IN TRAFFIC VOLUMES.

THE EXISTING DUEL LANE TIMBER BRIDGE ALONG FREMANTLE ROAD DOES NOT HAVE SUFFICIENT CAPACITY REQUIRED TO MEET THE PROJECTED TRAFFIC VOLUMES GENERATED BY INCREASED RESIDENTIAL DEVELOPMENT. THEREFORE A NEW, LARGER BRIDGE IS REQUIRED.

TWO PROPOSED ALTERNATIVES TO THE EXISTING BRIDGE WERE ASSESSED, THOSE BEING

1. A NEW 4-LANE DUEL CARRIAGEWAY BRIDGE ALIGNED WITH FREMANTLE ROAD AND SPENCER ROAD, THEREFORE REPLACING THE EXISTING BRIDGE AND,

2. A NEW 4-LANE DUEL CARRIAGEWAY BRIDGE ALIGNED WITH CORFIELD STREET AND SPENCER ROAD, UPSTREAM OF ALTERNATIVE 1.

REFER TO THE CONCEPTUAL PLAN FOR ALTERNATIVE LOCATIONS.

ALTERNATIVE 1.

THIS WAS REJECTED BECAUSE ALTHOUGH MEETING PROJECTED TRAFFIC VOLUME INCREASES ALONG FREMANTLE ROAD, THIS ALIGNMENT WOULD NOT ALLEVIATE TRAFFIC CONGESTION ALONG CORFIELD STREET. IT WOULD ALSO SIGNIFICANTLY INCREASE THE VOLUMES OF TRAFFIC ALONG PRINCE STREET AND SUBSEQUENT NOISE LEVELS. SEE FIG. 4.2

ALTERNATIVE 2.

THIS WILL BE ABLE TO ACCOMODATE THE PROJECTED INCREASES IN TRAFFIC VOLUME ALONG CORFIELD STREET RESULTING FROM INCREASED RESIDENTIAL DEVELOPMENT TO THE EAST OF THE PROPOSED DEVELOPMENT. THE EXTENSION OF FREMANTLE ROAD TO THE SOUTH TO JOIN CORFIELD STREET WILL ALSO ALLEVIATE CONGESTION ALONG FREMANTLE ROAD. THE SECOND ALTERNATIVE WILL ALLOW FOR DIRECT TRAFFIC FLOW INTO SPENCER ROAD & WARDON ROAD, AND ALLEVIATE UNDUE CONGESTION AND TRAFFIC RELATED NOISE ALONG PRINCE STREET IF ALTERNATIVE 1 WAS ADOPTED.

DISPLAY 4

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SECTION 5 – DESCRIPTION OF SITE

5.1 CADASTRAL INFORMATION

The proposed Southern River Bridge Project is located approximately 850 metres upstream from the junction of the Southern and Canning Rivers.

The proposed bridge development will span the southern river floodplain connecting Spencer Road realignment to the north west with the Corfield Street realignment to the south east.

Based on the City of Gosnells plan No CV/S68 the project area encompasses a number of titled lots.

These lot numbers are detailed below:

- Lot 4 – Prince Street
- Lot 1152
- Lot 50
- Lot 1143

Lot numbers are shown on Figure 1.2.

5.2 TOPOGRAPHY, GEOLOGY AND GROUNDWATER OF THE PROJECT AREA

5.2.1 Topography

The project area is situated on the Swan Coastal Plain which is a low lying, gently undulating area extending several hundred kilometres along the south–west coast of Western Australia.

In the Perth area the coastal plain extends from the coast, 30 km east to the Darling fault line which marks the commencement of the Darling Scarp.

Site Topography consists of three distinct geomorphic units:

- The relict degraded aeolian dunes of the Bassendean/Guildford formation.
- The river terrace adjacent to the floodplain consisting predominantly of alluvial deposits.
- An alluvial floodway deposit which contains the main river channel.

5.2.2 Geology

In the vicinity of the project area the stratigraphic sequence consists of a mix of recent alluvial deposits from the Southern River above clayey Pleistocene sands of aeolian origin from the Bassendean/Guildford Formation. These overlie meisoic shales and sandstones.

5.2.3 Groundwater

Extensive unconfined or semi-confined aquifers are present throughout the Perth area. These are associated with the recent alluvial deposits of the Swan River and the aeolian Pleistocene formations.

The Water Authority of Western Australia (WAWA) has no activity gauged bores in the vicinity of the proposed development. However maximum groundwater contours are available from hydrological data supplied by WAWA. Table 5.1 details maximum groundwater levels in the area in relation to ground levels.

TABLE 5.1 - MAXIMUM GROUNDWATER LEVELS

LOCATION	MAXIMUM WATER LEVEL AHD (m)	CURRENT GROUND LEVEL AHD (m)
Spencer/Warton Road, North of Warton Road junction	12	12 – 13
Spencer Road/Warton Road junction	11	11–12

The hydraulic gradient based on the hydrological data show, as expected, a groundwater flow toward the Southern River.

It should also be noted that the water table within the area of Gosnells is relatively high. This affects infiltration rates during periods of prolonged precipitation when the water table rises to the ground surface. At this point overland flow will dominate the drainage regime as the ground is fully saturated.

5.3 SOUTHERN RIVER AND ASSOCIATED FLOODPLAIN

The Southern River meanders across a floodplain which varies in width along the waterway. At the site of the proposed Southern River Bridge the floodplain is approximately 80 metres wide. The floodplain is characterised by three distinct geomorphic features:

(1) River Terraces bordering the floodway, i.e. the floodfringes

(2) The floodway itself and

(3) The main river channel housed within the floodway.

The Southern River is a focal point for stormwater drainage of the surrounding catchment. However, due to the relatively high infiltration rates of the local geology (unconfined alluvial and aeolian sand deposits), the rate of overland flow is reduced, especially during the summer months when precipitation rates and water table levels are lower.

There are exceptions to this general case, when cyclonic conditions prevail and excessive quantities of precipitation result in a rise in the water table and a subsequent increase in runoff. During the winter months however, precipitation rates are markedly higher and overland flow/stormwater dominates the drainage regime of the area.

TABLE 5.2 – DETAILS THE MEAN MONTHLY RAINFALL FOR THE CITY OF GOSNELLS

MONTH	J	F	M	A	M	J	J	A	S	O	N	D	TOTAL
mm	10	15	13	48	111	184	169	127	77	50	25	12	841

Information based on data collected by the Bureau of Meteorology.

During periods of high precipitation and consequently high runoff, the actual rates of flow within the Southern River remain low due to the very low gradients of the local topography. A typical gradient for the Southern River in this area is 1 in 700,

or 0.14%, this gradient produces flow rates of only approximately 0.1 – 0.3 m/s during non–flood periods. There are minimal increases in flow rates during 1/25 yr and 1/100 yr flood events, typical rates during these events are 0.44 m/sec and 0.45 m/sec respectively (See Table 5.3). The very low flow rates of the Southern River even during flood events enable advanced bank stabilisation to take place with the growth of fringe community flora. The fringing community is characterised as a Eucalyptus/Melaleuca woodland, including Flooded Gum, Swamp Paperback, Orange Wattle and Buffalo grass dominating the near ground cover. The densely vegetated banks reduce bank erosion and subsequent sedimentation rates during periods of higher flow velocities. Figure 5.1 contains photographic examples of dense bank vegetation.

TABLE 5.3 – COMPARES FLOW REGIME TO FLOW RATES

FLOW REGIME	FLOW RATE BELOW CURRENT BRIDGE (m/s)	FLOW RATE ABOVE CURRENT BRIDGE (m/s)	WATER LEVEL (AHD) (m)
NON FLOOD	0.0 – 0.3	0.0 – 0.3	2.84
1:25 YEAR EVENT	0.50	0.44	5.74
1:100 YEAR EVENT	0.54	0.45	6.06

Data tabulated from Southern River flood study Water Authority of Western Australia.

5.4 LANDUSE

5.4.1 Former Landuse

The first land grants in the Gosnells area were made in 1829. The early settlers began to develop the land for agricultural purposes, predominantly wheat, grazing of cattle, sheep and goats. By the late 19th Century a well established residential community had been established.

The opening of rail links to the area in the early 1900's prompted rapid suburban sub–division of the region. Residential sub–division continued at a rapid rate throughout the period, however it did not incorporate the low lying floodplain of the Southern River due to frequent winter flooding. Consequently, the floodplain topography has remained relatively unchanged throughout settlement with the

exception of the services, roads and other infrastructure development.

5.4.2 Adjacent Landuse

Adjacent and existing landuses in the immediate vicinity of the site, as shown in Figure 1.2, are briefly described below:

North	–	Southern River floodplain and river channel
North–east	–	Residential addresses along Lawrence Street and Windsor Drive
	–	Existing timber bridge on Fremantle Road
	–	Existing water main adjacent to Fremantle bridge
South	–	Southern River floodplain and river channel
South–west	–	Residential addresses along Yulan Court and Lilac Place
	–	Bicycle and walking path running adjacent to River Terrace
	–	Obsolete sewer pump station
	–	Small commercial shopping centre running adjacent to Warton Road
East	–	The existing Fremantle Road
	–	Residential addresses along Prince Street
	–	Disused market garden located on Lot 303 Prince Street
West	–	Spencer and Warton Road junction.

5.5 ABORIGINAL HERITAGE

Based on the Aboriginal Site Survey conducted by Tamora Pty Ltd in April 1992, no specific archaeological sites were located within the surveyed areas. Figure 5.2 details the archaeological survey boundaries. There are however registered archaeological sites within a four kilometre radius of the survey area, these sites are located adjacent to the Canning River.

The Ethnographic Survey for the Southern River Bridge Project was also conducted by Tamora Pty Ltd in April 1992. The survey identifies important camping and fishing areas beneath the path of the proposed bridge development.

It is clear that important Aboriginal areas have been identified. The proposed development will possibly impact these sensitive Aboriginal areas. Sections 6 and 7 of this PER discusses the possible impacts incurred and the management strategies adopted.

FIGURE 5·1
FRINGE COMMUNITY

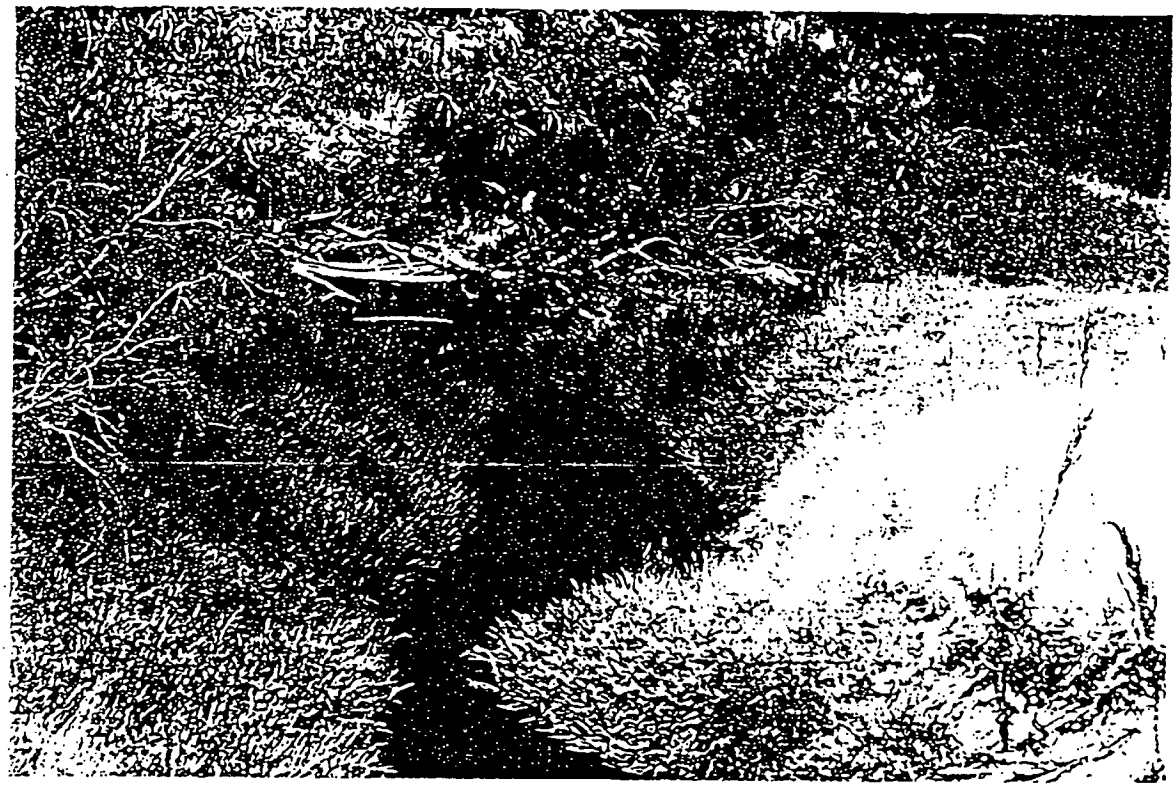
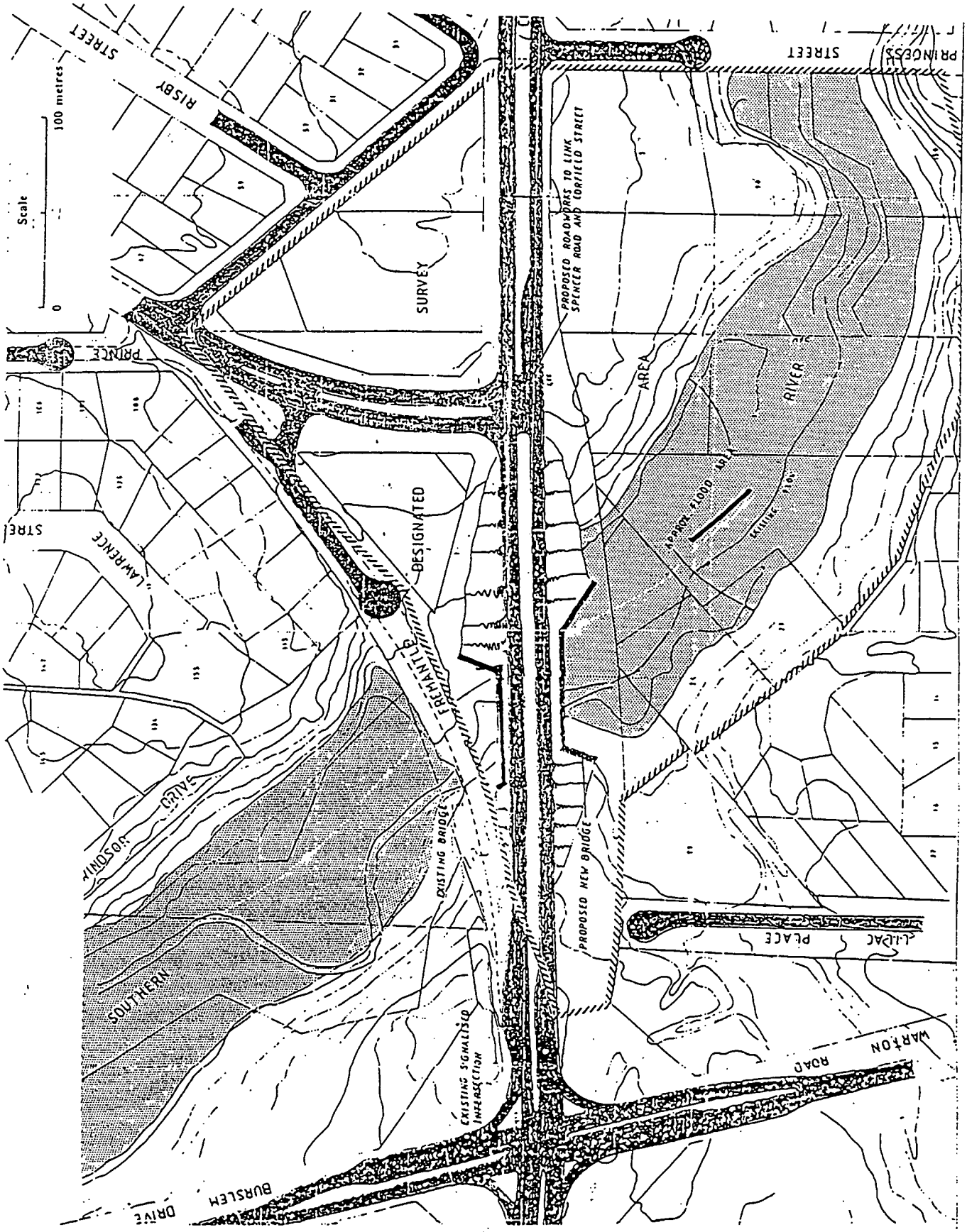


FIGURE 5·2
LOCALITY PLAN
OF SURVEYED ARE.



SECTION 6 - ENVIRONMENTAL ISSUES

6.1 INTRODUCTION

Assessment to determine the possible environmental impacts resulting from the proposed development are based on field inspections undertaken by CMPS&F, consultation with relevant government authorities and a series of sub-consultant reports. These reports include a noise impact study and a Biological Survey.

Site inspections and a formal biological survey identified potential environmental impacts that could effect the riverine environment in the vicinity of the proposed development.

The survey area is bounded by Fremantle Road, Prince Street, Princess Street and approximately the 10 m contour along the south bank of the Southern River between Prince Street and Fremantle Road. Figure 5.2 details study boundaries. The study area encompasses the riverine environment of both banks and the gently sloping floodplain.

Below is a brief summary of the current state of the environment including the System Six status, a biological report detailing flora and fauna type and discussion on the relationship between fauna and flora species, a noise assessment and a discussion of visual aspects of the site. Reports referred to but not in the Appendices can be made available upon request.

6.2 SYSTEM SIX

6.2.1 Description of the Environment

The Darling System, or System 6 as it has come to be known, consists of the hinterland of Perth. The System 6 area extends from Moore River to the North of Perth, South to the Blackwood River. It is bounded by the west coast between Guilderton and Bunbury and the eastern boundary includes Boyup Brook, Boddington and Toodyay. Figure 6.1 depicts the region covered by System 6.

In 1972 the EPA established the Conservation Through Reserves Committee (CTRC), to review and update the 1962 recommendation of a sub-committee of the

Australian Academy of Science (WA) with respect to National Parks and Nature Reserves of the State. The CTRC divided the State into 12 systems each representing specific natural and/or demographic characteristics. The report and recommendations for all systems except 6 and 7 were made public in 1975.

System 6 identifies opportunities for designating areas of land in the most populated part of Western Australia for purposes of conservation of natural areas and recreation in natural surroundings.

The proposed Southern River Bridge project is located in an area specifically identified by the System 6 Report. The area identified is termed M75 and consists of "The Canning River and its fringes from Nicholson Road Bridge to the boundary of the state forest, together with those parts of the Southern River and Wungong Rivers within the City of Gosnells". Figure 6.2 depicts the area identified in the System 6 Report.

Much of the area identified is reserved for parks and recreational purposes under the Metropolitan Region scheme or if not "reserved", it is being considered for possible future "reserves". Further comment is made in Section 9.

6.2.2 Impact on the Environment

Widespread alterations of the vegetation communities now exist within the study site due to clearing and introduction of exotics. This lessens their conservation value in relation to a floristic point of view, however their value as faunal habitat is not diminished. In addition to this the river and its floodplain offer important scenic features and provide a focus for both active and passive recreational activity, as stated in the System 6 Report.

Litter/plastic containers/building associated wastes could possibly find their way into the river if not adequately secured and removed off-site for disposal. This would obviously be aesthetically displeasing and potentially hazardous.

The river hydrology may be affected in a variety of ways. Increased erosional rates will lead to sedimentation downstream of the disturbance consequently affecting the flow regime of the Southern River.

The 100 year flood level in the area will be increased by 0.16 m if both bridges remain in place, which is acceptable in respect to WAWA's floodplain development guidelines. The removal of the existing bridge would decrease flood levels by

0.30 m, thus reducing the erosional impact (information provided by WAWA). Thus, the net effect of building the proposed bridge and removing the existing bridge would be to decrease the 10 year flood level by 0.14 m. Bearing in mind, however, the benefits of utilising the old bridge as a pedestrian/cyclist thoroughfare it would be appropriate to leave it in place as long as is economically viable – see Appendix D for WAWA's comments.

Erosion and siltation potential is also increased if fill material imported for bridge embankments is not stabilised during and after construction.

The use of heavy machinery could lead to oil/fuel spillage within the project area and subsequent contaminations of the Riverine environment.

Direct drainage off the constructed bridge and access roads onto the floodplain should be minimised to reduce the risk of overland flow and thus erosion potential and subsequent sedimentation.

6.3 VEGETATION

6.3.1 Description of the Environment

The study area is representative of two types of vegetation communities, these being the Fringe Woodlands along the river below the 8 metre contour and the remnant Banksia Woodland on the higher river terrace. The Fringe community is classified as being a Eucalyptus/Melaleuca woodland. Figure 5.1 contains photographic examples of the fringe community. The dominant canopy species within the study site are Eucalyptus Rudis (Flooded Gum) and Melaleuca Raphiophylla (Swamp Paperbark) with exotics (ie. Buffalo grass) dominating the understorey. Appendix B contains a list of species identified on–site.

On the higher ground, above the 8 metre contour the original vegetation would have been predominantly Banksia woodland. The only remnants of Banksia woodland within the study site consist of a small area dominated by Jarrah and Marri adjacent to Fremantle Road and a patch of Banksia just to the south of the Jarrah and Marri. Cleared paddocks to the south–west of Prince Street are dominated with assorted exotic grasses. Figure 6.4 contains photographic examples of remnant banksia woodland and exotic grasses.

6.3.2 Impact on the Environment

Within the region the corridor of vegetation running adjacent to the Southern River, the "Fringe community" or "Wetlands" is very significant for the continual presence

of many fauna species. While this fauna consists mainly of common species found within the Perth region the survival of such species in the urban landscape is highly desirable.

Imported fill may be contaminated with dieback which would affect flora, either directly or indirectly, and consequently fauna by way of food or shelter.

Removal of vegetation and soil disturbances during construction increase potential erosion rates especially along the bank.

6.4 VERTEBRATE FAUNA

6.4.1 Description of the Environment

The study area was visited once on the 17th March 1992. During this visit observation of fauna were recorded and notes were made based on the suitability of habitat for fauna which might be present but was not sighted during the site inspection. Information on possible species located within the study area were obtained from the WA Museum specimen records. Appendix C contains a table of Vertebrate Fauna Expected and Observed. No frogs were recorded during observation, however as many as seven frog species may be present, all of which are widespread in the Perth region. Four reptiles were observed however as many as sixteen species may be present. No rare or endangered reptiles are expected to be found within the study area.

Of the two mammal species observed out of a possible nine, the Quenda or Southern Brown Bandicoot was identified by its distinct fresh diggings. The Quenda is locally common around wetlands in the Perth region but is classed as rare and endangered. Nine species of birds were observed from a possible 55 species that may be present, none of the observed species of birds are classed as rare or endangered but three of the species listed as "probable, occasional visitors" are listed under the Wildlife Conservation Act. The Peregrine Falcon and the Carnaby's Black Cockatoo are regularly recorded in the Perth region, with both these birds being classed as in need of special protection.

6.4.2 Impact on the Environment

Clearing of native trees within the fringe community and in the remnant Banksia Woodland should be kept to a minimum as to maintain adequate habitat and also reduce erosion and sedimentation potential.

Bridge embankments and supports should be designed to allow for maximum movement of fauna along the river floodplain.

6.5 HABITATS/FAUNAL RELATIONSHIPS

6.5.1 Description of the Environment

The project area can be divided into two faunal habitats:

(1) Wetlands which include the Southern River itself and its floodplain and

(2) The uplands, including the degraded Banksia Woodland and secondary grassland.

The wetlands are continuous, extending along the Southern River, forming an important corridor through the suburbs for fauna movement/migration.

The surviving native trees of the uplands probably support resident and visiting birds for shelter and nesting roosts. The upland slopes and grassland provide foraging areas for the reptiles and the Quendas.

6.5.2 Impact on the Environment

Moderate amounts of dust generated during construction will not be detrimental to the native flora and fauna.

6.6 NOISE IMPACT ASSESSMENT

6.6.1 Description of the Environment

Introduction

The proponents commissioned a study to determine noise impacts of the proposed bridge and road realignment for the Southern River Bridge Project. All noise calculations were conducted in accordance with the methodology outlined in the "Traffic Noise study – Guidelines" (draft) from the Main Roads Western Australia.

Methodology

The calculations of the L_{10} (18 hour) noise levels were based on the following assumptions:

- Traffic speed of 60 km/hour.
- A dense asphalt road surface.
- The traffic include 8% heavy vehicles.
- The ground condition was predominantly soft between the source and receiver.
- The receiver is at the front of a house at the minimum set back of 7.5m.

The noise predictions calculations were based on the existing and forecast traffic volumes supplied by the proponent. These volumes are presented in Table 3.1.

6.6.2 Impact on the Environment

Results

Table 6.4 overleaf presents the results of the calculations to determine the noise levels at receiver locations. The noise levels at all locations (blocks) surrounding the project did not exceed 68 dBA. (Appendix E contains the Noise Impact Study). Block location are detailed in Figure 6.3.

Conclusions

With the exception of one area – Yulan Court/Wattle Way, the change in road alignment will result in lower noise levels for the adjacent residences. The predicted noise levels along Prince Street are between 2 to 10 dBA lower after the project finishes in 1995 than the existing noise levels. The predicted noise levels along Fremantle Road adjacent to the project area are between 6 to 9 dBA lower after the project finishes in 1995 than the existing noise levels.

The maximum noise levels in the Year 2034 at the above locations is 67 dBA. This is below the desired maximum level of 68 dBA and is also below current noise levels.

The predicted noise levels do not exceed 68 dBA at residences adjacent to the project area for the predicted traffic volumes hence no noise control measures are required.

TABLE 6.4 – CALCULATED (L_{10} (18 hour))
NOISE LEVELS AT SPECIFIED LOCATIONS

BLOCK	CALCULATED NOISE LEVELS IN dBA			
	1993	1995	2006	2034
FREMANTLE ROAD				
114	70	62	63	64
113	71	62	63	64
112	71	62	63	64
111	72	63	63	65
110	72	63	63	65
1029	72	64	64	66
2727	72	66	65	67
PRINCE STREET				
62	68	66	65	67
61	67	61	61	63
60	67	59	60	61
59	67	58	59	61
37	67	57	60	61
36	67	57	61	61
30	67	59	62	63
31	66	61	65	66
YULAN COURT				
33	56	62	63	64

6.7 VISUAL IMPACTS

6.7.1 Description of the Environment

Road alignment works to be undertaken on Corfield, Spencer and Fremantle Roads will follow, where possible naturally occurring ground contours. These areas are predominantly level, resulting in reduced fill requirements for road construction, which in turn will lessen the visual impacts associated with alignment works.

6.7.2 Impact on the Environment

The construction of the new four–lane dual carriageway bridge over the Southern River, although some 4.25 metres above the floodplain will remain below much of the tree canopy dominating the floodplain. This canopy barrier will reduce the visual impacts incurred on residential properties along Fremantle Road, Prince Street, Yulan Court and Wattle Way.

Headlight spill from vehicles circulating the roundabout has the potential of causing inconvenience to local residential properties. Management options to alleviate headlight spill are detailed in Section 9.

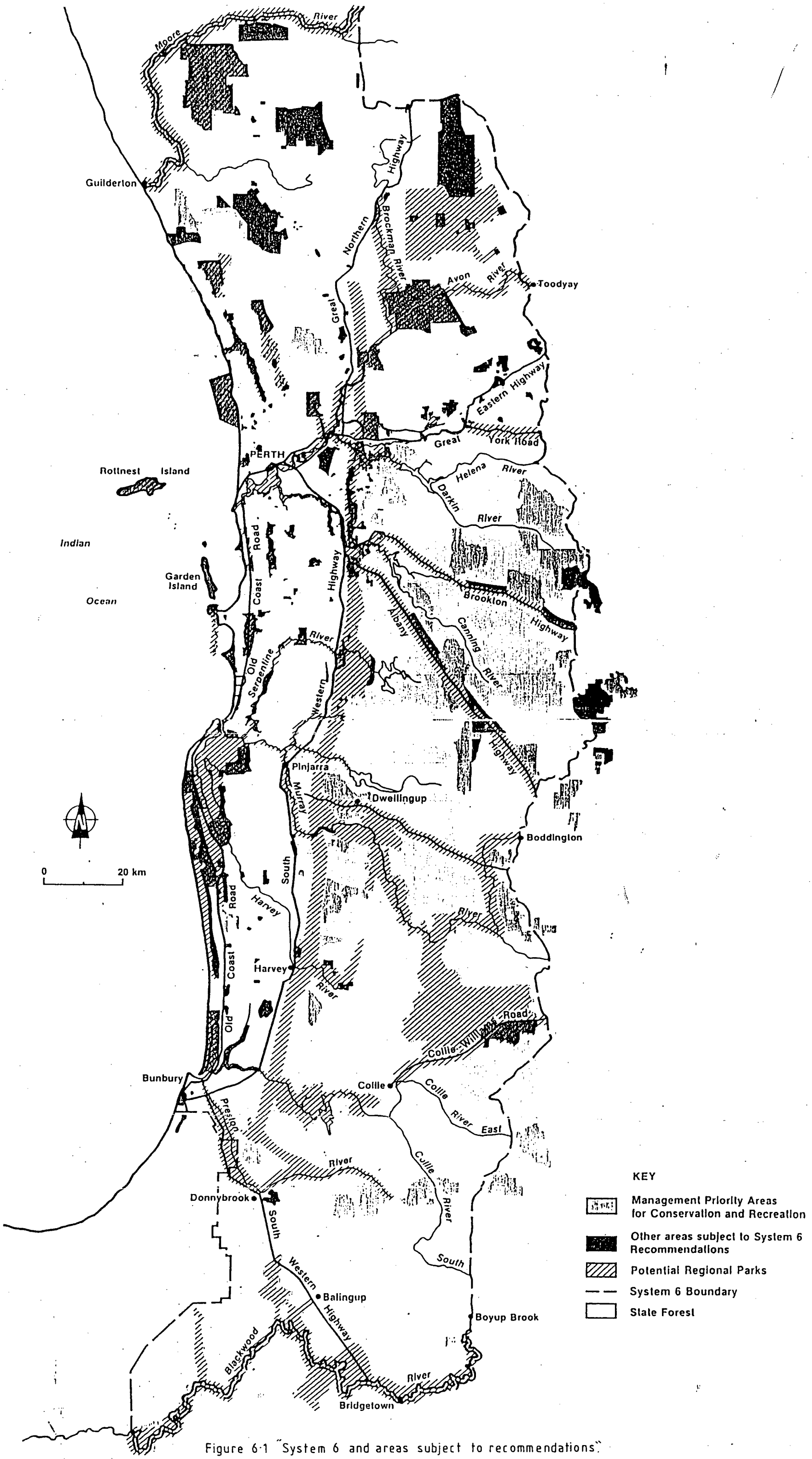
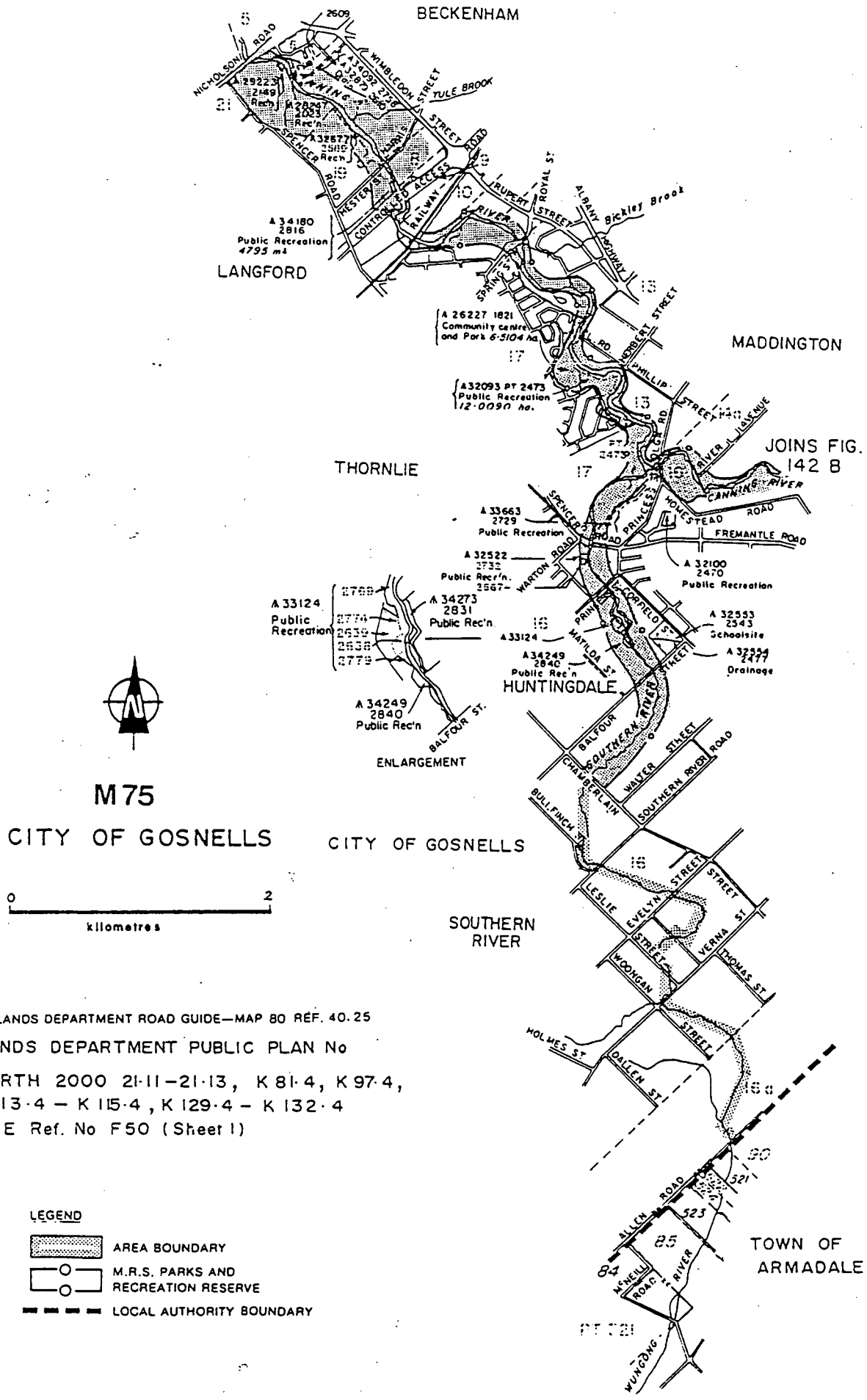


Figure 6·1 "System 6 and areas subject to recommendations"

FIGURE 6·1

FIGURE 6·2



1980 LANDS DEPARTMENT ROAD GUIDE—MAP 80 REF. 40.25

LANDS DEPARTMENT PUBLIC PLAN No

PERTH 2000 21·11–21·13, K 81·4, K 97·4, K 113·4 – K 115·4, K 129·4 – K 132·4

DCE Ref. No F50 (Sheet 1)

FIGURE 6·3
BLOCK LOCATIONS

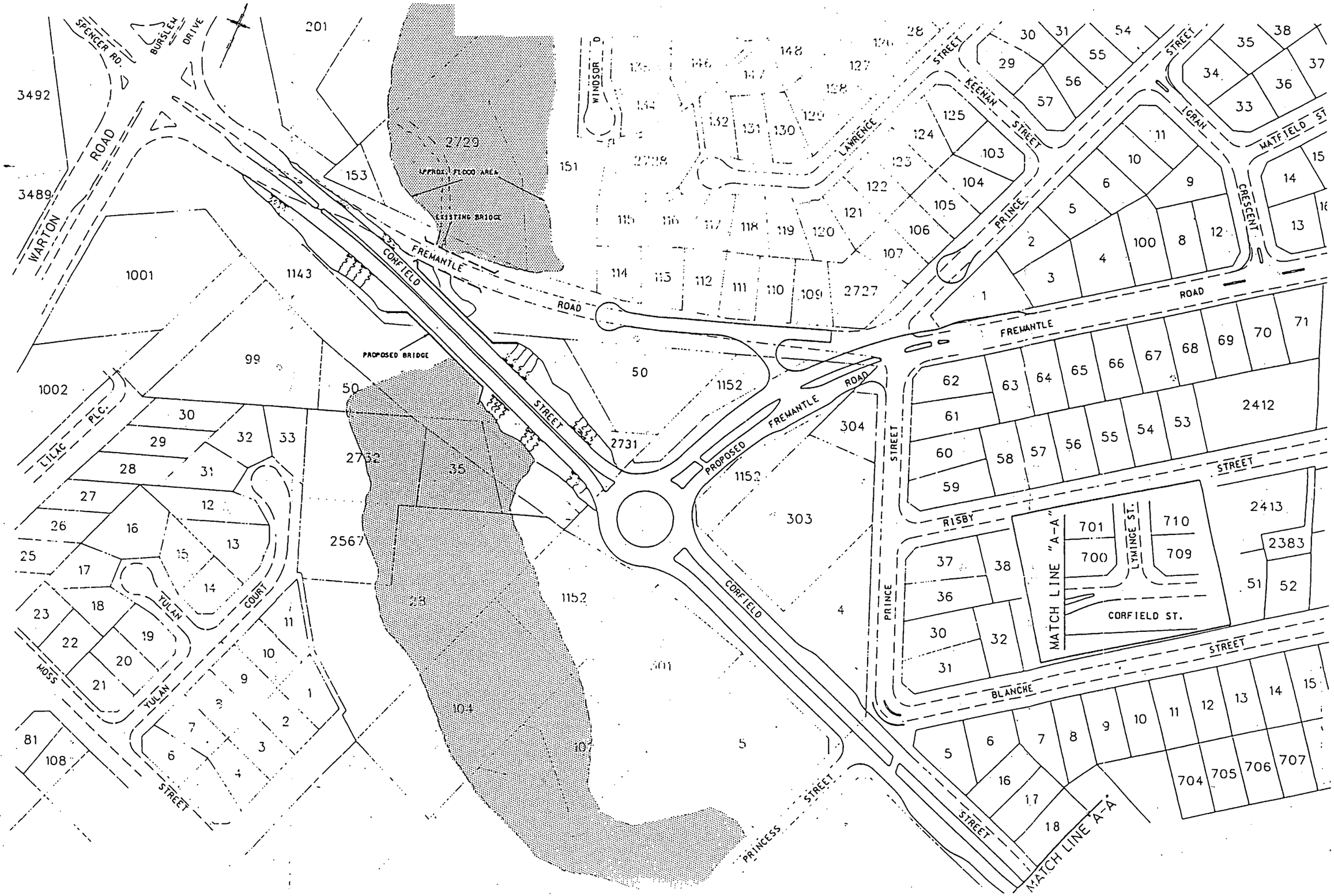
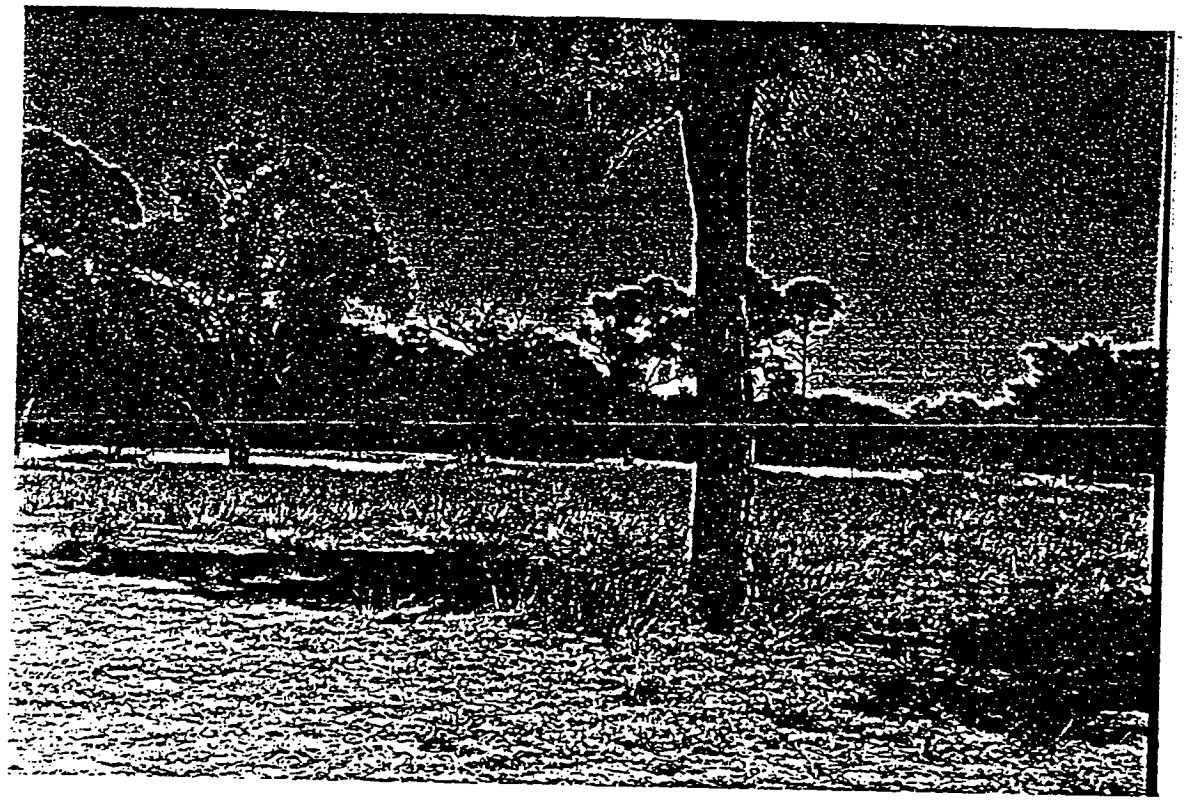
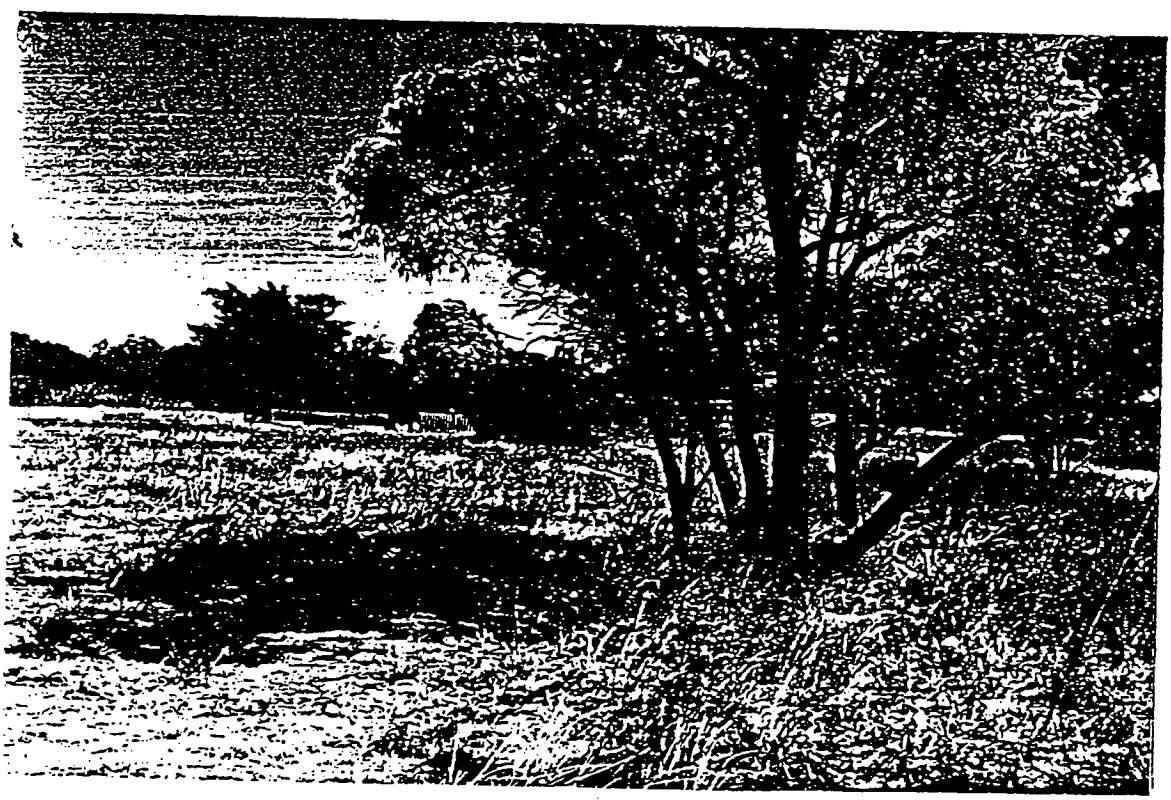


FIGURE 6.4
REMNANT BANKSIA WOODLAND
AND ASSORTED EXOTIC GRASSES





SECTION 7 - ABORIGINAL ISSUES

7.1 ABORIGINAL IMPACTS

Two independent reports were commissioned by the proponent to investigate the project area for the presence of Aboriginal sites and Ethnographic assessment. Both reports were prepared by Tamora Pty Ltd in April 1992.

7.1.1 Aboriginal Site Survey

The survey area is identical to the biological survey area depicted in Figure 5.2. A number of Aboriginal trustees and informants were consulted prior to commencement of the archaeological survey. The entire site was surveyed on foot, however it should be noted that in some areas of the floodplain visibility was not clear due to the dense nature of the vegetation.

No Aboriginal sites were located within the survey area; however the location of neighbouring Aboriginal sites within a 4 km radius suggest that archaeological sites are likely to occur along existing rivers and associated wetlands. Figure 7.1 depicts these sites. Due to the dense vegetation in parts and also that much of the surveyed area has been disturbed it is possible that previous archaeological sites within the survey area have been covered. Based on the survey results "archaeological sites should not be an impediment to the granting by relevant Government Agencies of permission for the proposed construction works". (Louise J. Bavin,Tamora Pty Ltd, p.12).

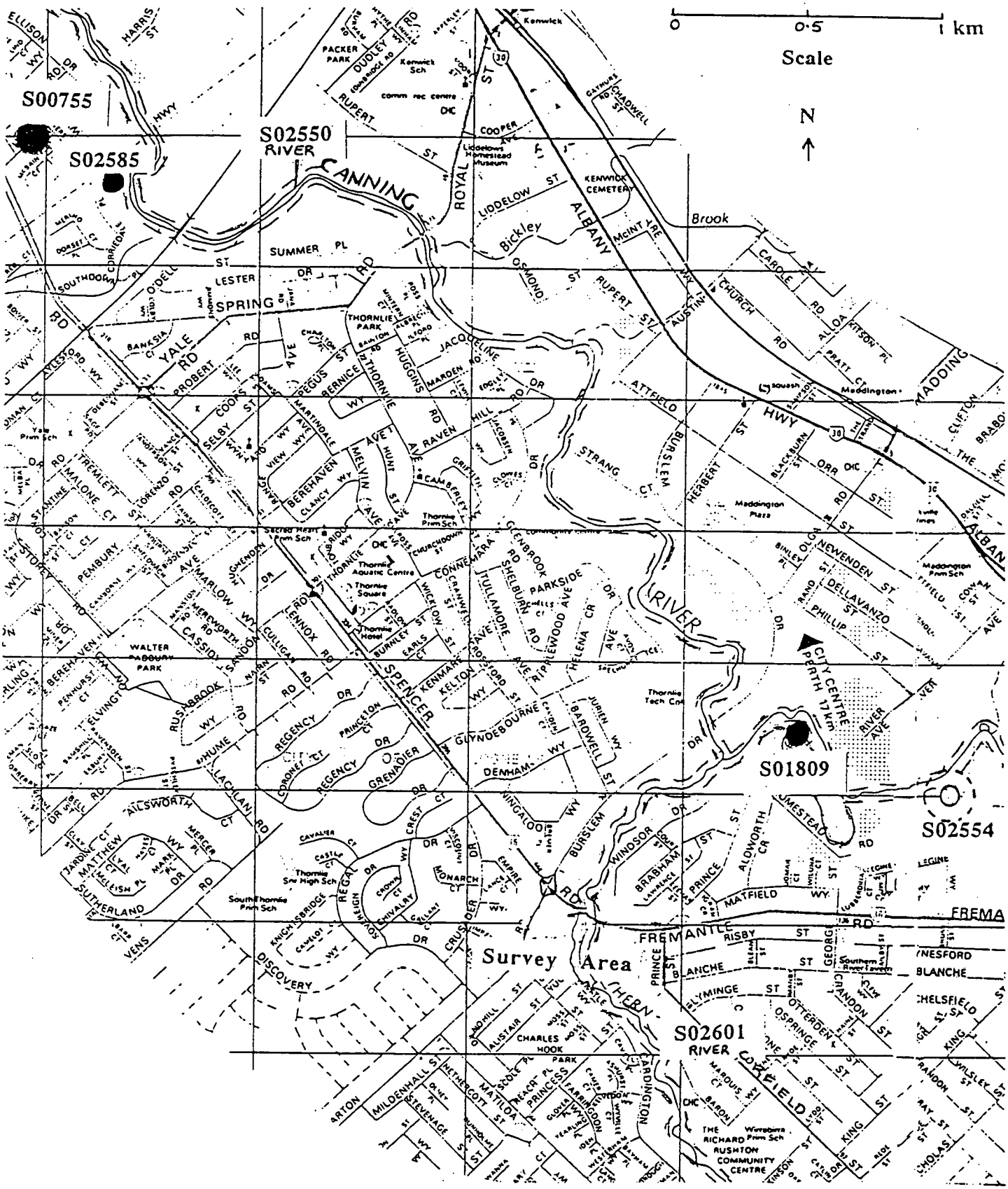
7.1.2 Ethnographic Survey

The ethnographic survey encompassed the same area as that of the Aboriginal site survey. The ethnographic survey consisted of archival research, a physical examination of the project area and interviews with eleven Aboriginal informants. A further on-site meeting was conducted on the 12th February 1993, present at the meeting were Aboriginal Informants, Council Engineers, Main Roads Department Bridge Engineers and an Anthropologist. Based on the ethnographic survey and the meeting conducted in February 1993 the following was identified as a sensitive ethnographic area.

- Important camping and fishing areas were located either side of the Southern River beneath the path of the new bridge.

Management strategies adopted to minimise damage to the area identified in the ethnographic survey will be discussed in Section 9, Aboriginal Heritage Commitments.

Figure 7·1 Plan showing the location of sites registered by the Department of Aboriginal Sites.



SECTION 8 – PUBLIC PARTICIPATION PROGRAMME

SECTION 8 - PUBLIC PARTICIPATION PROGRAMME

8.1 INTRODUCTION

A Public Participation Programme was conducted by the consultants on behalf of Gosnells City Council. The programme involved three distinct phases which are detailed below:

- **Phase 1: Advertising**

  Phase 1 – involved media releases and local letter drops informing the community of the forthcoming public display and the venues where it could be viewed.

- **Phase 2: Public Display**

  The public display was open for a period of two weeks between 16th August 1993 to 28th August 1993. The first week at Gosnells library and the second at Thornlie library. The display was staffed on each Saturday morning from 9.00 am to Noon by the consultant and a Council staff member. The community was encouraged throughout the display period to submit written comments regarding the proposed development.

- **Phase 3 : Summary of Public Submissions**

  Written and verbal submissions were summarised by the consultant with salient points highlighted.

8.2 SUMMARY OF PUBLIC SUBMISSIONS

A total of thirty seven (37) written submissions from the community were received during the course of the public participation programme. Thirty one (31) of these were in favour of the proposed development, three (4) were against and two (2) raised specific concerns but did not support nor reject the proposed project.

A number of salient points/specific concerns were raised by the community. Table 8.1, overleaf details these concerns and ranks them in terms of frequency.

TABLE 8.1 - SUMMARY OF PUBLIC CONCERNS

SALIENT POINT/CONCERNS	TALLY
Unable to access driveway from cul-de-sac Fremantle Road	I
Concerns regarding increased noise and headlight spill for Yulan Court, Wattle Way residents	II
Support the removal of existing bridge and rehabilitate area once development is complete	I
Unnecessary expenditure of public funds on a No Through Road	I
Will cut off traffic to Gosnells City Centre	I
Traffic lights rather than roundabout	II
Unable to turn right from driveway at lots 16, 17, 18 - Corfield Street	I
Improve general traffic in area especially congestion at Fremantle Road/Prince Street	VIII
Require speed islands/humps along Murchison Way	I
Concerns regarding increases in pollution and general environmental impacts	I
Islands/barriers near Igran Crescent/Fremantle Road to close to driveway - lot 71	I
Support dual use paths	II

SECTION 9 - COMMITMENTS

9.1 GENERAL

Based on the information supplied from the sub-consultants reports, discussions with the relevant government authorities and onsite field inspection/investigation a series of management commitments have been prepared. The commitments when implemented by the proponent will minimise the environmental, social and heritage impacts that could potentially arise from construction of the proposed Southern River Bridge and the associated road realignment.

9.2 PHYSICAL/BIOLOGICAL CONTROL AND MANAGEMENT COMMITMENTS

To minimise floodplain erosion and bank degradation the following strategies will be carried out by the proponent:

(1) Access tracks to work areas must follow a pre-determined route avoiding drainage depressions, mature trees and the 4 m buffer zone either side of the stream bed. ***Action - Project Manager(City of Gosnells)***

(2) Vehicle activity within 4 m of river bed will be restricted to reduce risk of bank degradation by the erection of a suitable fence. ***Action - Project Manager***

(3) Access tracks on completion of the works will be revegetated with native species sighted in the study area. (See Appendix B species list).
Action - Project Manager

(4) Silt trap devices such as sandbagging, geotextile fabrics and/or hay bales will be placed along the 4 m boundary of the buffer zone adjacent to the construction area on each side of the river preventing sedimentation of the water course. Sedimentation control measures along the water course will be left in place until revegetation of the disturbed area is complete.
Action - Project Manager

(5) Loose imported fill material for embankment construction i.e. sand and topsoil will be stabilised when not actively utilised. Short term stabilisation techniques could include applying a geo-crust type spray to hold loose fill in place, cover with an impermeable layer i.e. plastic or install a silt barrier

at the base of the fill stockpile to prevent sediments escaping into the riverine environment. Vegetating the fill stockpile is also a possibility for long term erosion/sedimentation prevention. ***Action – Project Manager***

(6) If stockpiling of fill is probable, a pre–determined location above the 7 m contour is required to minimise erosion potential in the case of a flood event. The pre–determined location will not obstruct any overland drainage channels. ***Action – Project Manager***

(7) Bridge design and access roads will include measures to prevent direct drainage of stormwater off the structures directly onto the floodplain and/or the Southern River by the provision of suitable drainage channels to carry water to the river. ***Action – Project Manager***

(8) Frequent inspection of the project area will occur during the construction phase to ensure that potential erosion/sedimentation hotspots are identified so preventative measures can be taken. ***Action – Project Manager***

To minimise potential degradation to the biological environment the following commitments will be carried out by the proponent:

(9) Clearing of vegetation must be kept to a minimum, this is especially relevant to mature trees as their aesthetic value and soil stabilising qualities are important in relation to erosion/sedimentation control and floristic/habitat reasons. ***Action – Project Manager***

(10) Felled portion of trees and shrubs will be cut to manageable lengths and left on site wherever possible to provide future habitat for fauna. The roots of the felled trees will be left insitu unless under embankments or structuring to minimise ground disturbance. ***Action – Project Manager***

(11) In revegetation and landscaping of the site on completion of the project, the native species identified during the survey will be included as they are demonstrably hardy and good competitors with the weedy species. Revegetation which aims to complement or increase the habitat for native fauna should incorporate representative plants from all vegetation strata, i.e. trees, shrubs and ground covers. The success of revegetation will be aided by preliminary weed control, as all areas are heavily infested. Herbicide use may be found to be appropriate, but application must be carried out in strict accordance with Gosnells City or Main Roads guidelines. ***Action – Project Manager***

(12) Dieback (infection with the fungus Phytophthora cinnamomi) does not appear to be present on the survey site. Every attempt must be made to ensure that fill material used during construction is also free of the disease. Its importation could have implications for remnant vegetation on the site and downstream, and also for the success of revegetation measures. The use of dieback hygiene procedures for mobile plant during construction will be assessed when the movements of such plant to and from the site is known. ***Action – Project Manager***

(13) Fragmentation rather than loss of habitat may be the significant factor for the native fauna and particularly for the Quenda on the site. Therefore it is important that the bridge design allow for movement of these animals under the bridge along the eastern bank of the river. The old alignment of Fremantle Road on the east of the river will also be removed and the area rehabilitated. This will allow free access to the remnant woodland adjacent to, and south of Fremantle Road. ***Action – Project Manager***

(14) In light of the presence of the Quenda (an animal scheduled as rare and endangered) on the site, it is recommended that the Council consult with the Department of Conservation and Land Management's rare fauna biologist (Mr Gordon Wyre) prior to construction, in order for CALM to determine if relocation of the Quenda is required.
Action – Project Manager

9.3 POLLUTION CONTROL COMMITMENTS

To minimise the risk of polluting the riverine environment the following commitments will be carried out by the proponent:

(15) A pre-determined location above the 7 m contour be selected for the purpose of refuelling machinery. The area should be surrounded by a sediment barrier or catch drain to minimise the potential of riverine contamination resulting from a fuel/oil/rubbish spillage. In the event of a spill outside the designated fuelling area the contaminated soil will be immediately excavated and transported to an adequate disposal site or for temporary measures into the refuelling area. ***Action – Project Manager***

(16) Site hygiene must be maintained at a high standard. All refuse will be removed for disposal offsite. ***Action – Project Manager.***

9.4 ABORIGINAL HERITAGE COMMITMENTS

The ethnographic report identified important camping and fishing areas beneath the path of the new bridge. Whilst the informants recognised the necessity for the new bridge development they were concerned about the location of the support piers in relation to the river and its associated banks. To accommodate these concerns the following recommendations have been prepared.

(17) A buffer zone be set up, marked by a fence/silt barrier 4 m either side of the existing river bed. Within four metres of the river bed there will be no construction or movement of heavy machinery. ***Action – Project Manager***

(18) Should any artifactual material be unearthed during the construction works the developers and/or contractors should report finding to the Department of Aboriginal Sites. ***Action – Project Manager***

9.5 SYSTEM 6: COMMENTS

The commitment below has been included within this PER because the site of the proposed development is located within an area identified by the System 6 Report as "Reserved for Parks and Recreation under the Metropolitan Region Scheme or is being considered for possible future reserves".

(19) Areas identified through planning procedures as open space of regional significance will, where appropriate, to be designated as Regional Parks. The area is already designated as Region Open Space.

9.6 NOISE COMMITMENTS

Even though resultant traffic noise from the proposed development is calculated to fall below the 68 dBA, increases in existing noise levels will be experienced in the vicinity of Yulan Court/Wattle Way.

(21) To reduce these estimated levels down to existing levels, implementation of noise attenuation barriers in the forms of landscaping will be developed on either side of Corfield Street. Landscaping will also prevent headlight spill inconveniencing properties on Yulan Court, Wattleway and Prince Street. ***Action – Project Manager***

9.7 VISUAL COMMITMENTS

Refer to commitment (21).

REPLACEMENT OF EXISTING BRIDGE OVER THE SOUTHERN RIVER ON FREMANTLE ROAD (ASSESSMENT NUMBER 735) WITH A NEW BRIDGE ON THE SPENCER ROAD/CORFIELD STREET ALIGNMENT

PUBLIC ENVIRONMENTAL REVIEW GUIDELINE'S

Overview

In Western Australia all environmental reviews are about protecting the environment. The fundamental requirement is for the proponent to describe what they propose to do, to discuss the potential environmental impacts of the proposal, and then to describe how those environmental impacts are going to be managed so that the environment is protected.

If the proponent can demonstrate that the environment will be protected then the proposal will be found environmentally acceptable; if the proponent cannot show that the environment would be protected then the Environmental Protection Authority (EPA) would recommend against the proposal.

Throughout the process it is the aim of the EPA to advise and assist the proponent to improve or modify the proposal in such a way that the environment is protected. Nonetheless, the environmental review in Western Australia is proponent driven, and it is up to the proponent to identify the potential environmental impacts and design and implement proposals which protect the environment.

For this proposal, protecting the environment means that the natural and social values associated with the urban areas adjacent to the route, particularly the Southern River areas, are protected. Where these values cannot be protected, proposals to mitigate the impacts are required.

Purpose of a PER

The primary purpose of a PER is to communicate clearly with the public and Government agencies so that the Environmental Protection Authority can obtain informed comments on the proposal. This provides the basis for the EPA to provide advice to Government on protecting the environment. As such, Environmental Impact Assessment is quite deliberately a public process.

Objectives of the Review

The Public Environmental Review should have the following objectives:

- to place this project in the context of the regional environment;
- to explain the issues and decisions which led to the choice of this project at this place at this time;
- to set out the environmental impacts that the project may have; and
- for each impact, to describe any environmental management steps the proponent believes would avoid, mitigate or ameliorate that impact.

The PER should focus on the major issues for the area and anticipate questions that members of the public will raise. Data describing the environment should be directly related to the discussion of the potential impacts of the proposal. Both should then relate directly to the actions proposed to manage those impacts.

Key Issues

The critical issue for the proposal is likely to be the management of road/bridge/drainage construction across the Southern River and at the Spencer/Corfield Street alignment. The section of the Southern River affected by the Spencer/ Corfield proposal is encompassed by a System Six Regional Park Recommendation (M75), and is reserved for Parks and Recreation under the Metropolitan Regional Scheme. It is therefore fundamental that the PER show a detailed understanding of environmental and social values in the area.

The key issues for this proposal include:

- the management of road/bridge /drainage construction at the Southern River and its impact on the river and the System Six Recommendation (M75);
- water management issues:
  - river bank erosion and siltation control;
  - fill control during construction;
  - maintenance of surface water drainage patterns, including stormwater and overland flow, during and after construction to ensure minimum pollution or flooding to the watercourse;
  - flood management;
  - impacts on river dynamics;
  - river maintenance and management;
- operational management issues:
  - dust and noise abatement;
  - contingency plans for accidents such as fuel spills;
- conservation and social issues;
  - impacts on flora and fauna;
  - rehabiliatation and revegetation along the Southern River margins;
  - protection of aesthetic and recreational values; and
  - the impact of increased traffic on the riverine and residential areas.

Any other key issues raised during the preparation of the PER should be addressed in conjunction with minor issues.

Public Partition and Consultation

A description should be provided of the public participation and consultation activities undertaken by the proponent in preparing the PER. It should describe the activities undertaken, the dates, the groups and individuals involved and the objectives of the activities. Cross reference should be made with the description of environmental management for the proposal which should clearly indicate how community concerns have been addressed. Where these concerns are dealt with via other departments or procedures, outside the Environmental Protection Authority process, these can be noted and referenced here.

Detailed List of Environmental Commitments

The commitments being made by the proponent to protect the environment should be clearly defined and separately listed. Where an environmental problem has the potential to occur, there should be a commitment to rectify it. They should be numbered and take the form of:

a who will do the work;

b what the work is;

c when the work will be carried out; and

d to whose satisfaction the work will be carried out.

- All actionable and auditable commitments made in the body of the document should be numbered and summarised in this list.

APPENDIX B.

SPECIES LIST FOR *EUCALYPTUS/MELALEUCA* COMPLEX (Penn, 1983).

* = Plant not native to the area

Acacia saligna
Alternanthera nodiflora
Apium prostratum
Asparagus asparagoides
Astartea fascicularis
Aster subulatus
Atriplex prostrata

Baumea juncea
Bolboschoenus caldwellii
* Briza maxima

Carex inversa
Casuarina obesa
Centella asiatica
Chenopodium melanocarpum
Conyza bonariensis
Cotula coronopifolia
* Cynodon dactylon
Cyperus alterniflorus

* Ehrharta calycina
Ehrharta erecta
Eucalyptus rudis

Gomphocarpus fructicosus

* Homeria collina

Isolepis marginata

Juncus kraussii
Juncus pallidus

Lactuca serriola
* Lolium multiflorum
Lotus uliginosus

Melaleuca hamulosa
Melaleuca preissiana
Melaleuca raphiophylla
Myoporum caprarioides

* Oxalis pes-caprae

: Paspalum dilatatum
* Paspalum distichum
Polygonum salicifolium
: Polypogon monspeliensis
Pteridium esculentum

Rumex crispus

: Solanum nigrum
* Sonchus asper
* Stenotaphrum secundatum

Triglochin procera
: Typha orientalis

* Watsonia bulbilifera

: Zantedeschia aethiopica

SOUTHERN RIVER BRIDGE SITE

ALPHABETICAL CHECKLIST OF VASCULAR PLANTS.

Common names are given where these are in common usage.
* = Plant not native to the site
) = Planted

*	Acacia podalyriifolia	Black Wattle
	Acacia pulchella	Prickly Moses
	Acacia saligna	Orange Wattle
)*	Agonis flexuosa	Peppermint
	Allocasuarina fraseriana	Common Sheoak
*	Amaryllis belladonna	Easter Lily
*	Arctotheca calendula	Cape Weed
*	Arundo donax	Giant Reed
*	Avena sp.	Wild Oat
	Banksia attenuata	Candle Banksia
	Banksia menziesii	Firewood Banksia
	Baumea articulata	Jointed Twig-rush
*	Briza maxima	Blowfly Grass
*	Citrullus sp.	Watermelon
*	Conyza bonariensis	Flaxleaf Fleabane
*	Cortaderia selloana	Pampas Grass
*	Cynodon dactylon	Couch Grass
*	Dittrichia graveolens	Stinkwort
*	Ehrharta calycina	Perenial Veldtgrass
*	Eragrostis curvula	African Lovegrass
*	Erythrina caffra x	Coral Tree
	Eucalyptus calophylla	Marri
	Eucalyptus marginata	Jarrah
	Eucalyptus rudis	Flooded Gum
*	Gomphocarpus fructicosus	Narrowleaf Cottonbush
	Hakea prostrata	Harsh Hakea
	Hardenbergia comptoniana	Native Wisteria
*	Hibiscus sp. x	Cultivated Hibiscus
*	Hypochaeris glabra	Smooth Catsear/Flatweed
	Hypoxis occidentalis	
	Jacksonia furcellata	Grey Stinkwood
	Jacksonia sternbergiana	Green Stinkwood

	Kennedia prostrata	Running Postman
*	Lactuca saligna	Wild Lettuce
	Lantana camara	Lantana
	Lupinus spp.	Lupins
	Melaleuca raphiophylla	Swamp Paperbark
*	Monstera deliciosa	Breadfruit Plant
	Paspalum dilatatum	Paspalum
*	Pinus pinaster	Pinaster Pine
	Pteridium esculentum	Bracken
*	Ricinus communis	Castor Oil Plant
	Rhynchelytrum repens	Red Natal Grass
	Rumex crispus	Curled Dock
*	Rosa sp.	Cultivated Rose
	Salix babylonica	Weeping Willow
*	Shinus terebinthifolius	Japanese Pepper Tree
	Solanum nigrum	Nightshade
*	Stenotaphrum secundatum	Buffalo Grass
*	Strelitzia reginae	Bird of Paradise
*	Trifolium arvense	Hare's Foot Clover
	Typha orientalis	Bulrush
*	Watsonia bulbillifera	Bulbil Watsonia
	Zantedeschia aethiopica	Arum Lily

APPENDIX C.

SOUTHERN RIVER BRIDGE SITE

TABLES OF VERTEBRATE FAUNA - EXPECTED AND OBSERVED.

ABLE 1. Amphibian and reptile species present (+ observed on 17/03/'92) or possibly present in the project area. Possibly present species were determined om WA Museum and personal records from the general area.

Species	Observed 17/03/'92
Frogs	
Hylidae (tree-frogs)	
Litoria adelaidensis Slender Tree-Frog	
Litoria moorei Motor-bike Frog	
Leptodactylidae (ground frogs)	
Crinia glauertii	
Crinia insignifera	
Heleioporus eyrei Moaning Frog	
Limnodynastes dorsalis Banjo Frog	
Pseudophryne guentheri	
Reptiles	
Chelidae (freshwater tortoises)	
Chelodina oblonga Long-necked Tortoise	
Gekkonidae (geckoes)	
Diplodactylus spinigereus Spiny-tailed Gecko	
Phyllodactylus marmoratus Marbled Gecko	
Scincidae (skinks)	
Bassiana (Leiolopisma) trilineata	+
Cryptoblepharus plagiocephalus Fence Lizard	
Ctenotus fallens	
Ctenotus impar	
Egernia kingii King's Skink	
Hemiergis peronii	
Lerista elegans	
Lerista lineata	
Menetia greyii	+
Tiliqua rugosa Bobtail	
Elapidae (front-fanged snakes)	
Notechis scutatus Tiger Snake	+
Pseudonaja affinis Dugite	+

ABLE 2. Mammal species present (+ observed on 17/03/'92) or possibly present in the project area. Possibly present species were determined from WA Museum nd personal records from the general area. Introduced species are indicated I).

Species		Present 17/03/'92
	Peramelidae (bandicoots)	
Isoodon obesulus	Quenda or southern brown bandicoot	+
	Phalangeridae (possums)	
Trichosurus vulpecula	Brush-tailed Possum	+
	Mollosidae (mastiff bats)	
Tadarida australis	White-striped Bat	
	Vespertilionidae ("ordinary" bats)	
Chalinolobus gouldii	Gould's Wattled Bat	
	Muridae (rats and mice)	
Hydromys chrysogaster	Water Rat	
(I) *Mus musculus*	House Mouse	
(I) *Rattus rattus*	Black Rat	
(I) *Rattus norvegicus*	Brown Rat	
	Leporidae (rabbits and hares)	
(I) *Oryctolagus cuniculus*	European Rabbit	
	Canidae (dogs and foxes)	
(I) *Vulpes vulpes*	Red Fox	

ABLE 3. Bird species present (+ observed on 17/03/'92) or possibly present in the project area. Possibly present species were determined from Van Delft 1988) and personal records from the general area. Introduced species are ndicated (I). The probable status of each species is indicated as follows: R = resident (usually present throughout the year); S = seasonal (migratory pecies present for only part of the year and; O = occasional (present as regular visitors only).

Species	Observed 17/03/'92	Probable Status
Little Pied Cormorant *Phalacrocorax melanoleucos*		O
White-faced Heron *Ardea novaehollandiae*		O
Rufous Night Heron *Nycticorax caledonicus*		O
Black Bittern *Dupetor flavicollis*		O
Pacific Black Duck *Anas superciliosus*		O
Whistling Kite *Haliastur sphenurus*		O
Brown Goshawk *Accipiter fasciatus*		O
Collared Sparrowhawk *Accipiter cirrhocephalus*	+	O
Peregrine Falcon *Falco peregrinus*		O
Australian Hobby *Falco longipennis*		O
Australian Kestrel *Falco cenchroides*		O
Buff-banded Rail *Rallus philippensis*		O
Dusky Moorhen *Gallinula tenebrosa*		O
Black-fronted Plove *Charadrius melanops*		O
(I) Spotted Turtle-Dove *Streptopelia chinensis*		R
(I) Laughing Turtle-Dove *Streptopelia senegalensis*		R
Carnaby's Cockatoo *Calyptorhynchus latirostris*		S
Galah *Cacatua roseicapilla*	+	O
Port Lincoln Ringneck *Barnardius zonarius*	+	R
Pallid Cuckoo *Cuculus pallidus*		S
Fan-tailed Cuckoo *Cuculus pyrrhophanus*		S
Horsfield's Bronze-Cuckoo *Chrysococcyx basalis*		S
Shining Bronze-Cuckoo *Chrysococcyx lucidus*		S
Southern Boobook Owl *Ninox novaeseelandiae*		O
Barn Owl *Tyto alba*		O
Tawny Frogmouth *Podargus strigoides*		O
Laughing Kookaburra *Dacelo novaeguineae*	+	R

.E 3. (Continued).

Species	Observed 17/03/'92	Probable Status
Sacred Kingfisher *Halcyon sancta*		S
Rainbow Bee-eater *Merops ornatus*		S
Welcome Swallow *Hirundo neoxena*		R
Tree Martin *Cecropis nigricans*		R
Richard's Pipit *Anthus novaeseelandiae*		R
Black-faced Cuckoo-shrike *Coracina novaehollandiae*		R
Rufous Whistler *Pachycephala rufiventris*		R
Grey Fantail *Rhipidura fuliginosa*	+	R
Willie Wagtail *Rhipidura leucophrys*		R
Clamorous Reed-Warbler *Acrocephalus stentoreus*		0
Little Grassbird *Megalurus gramineus*		0
Western Gerygone *Gerygone fusca*		0
Inland Thornbill *Acanthiza apicalis*		R
Yellow-rumped Thornbill *Acanthiza chrysorrhoa*		R
Varied Sittella *Daphoenositta chrysoptera*		R
Red Wattlebird *Anthochaera carunculata*	+	0
Little Wattlebird *Anthochaera chrysoptera*		0
Singing Honeyeater *Lichenostomus virescens*		R
Brown Honeyeater *Lichmera indistincta*		R
New Holland Honeyeater *Phylidoniris novaehollandiae*		0
Mistletoebird *Dicaeum hirundinaceum*	+	0
Striated Pardalote *Pardalotus striatus*		S
Silvereye *Zosterops lateralis*	+	R
Australian Magpie-lark *Grallina cyanoleuca*		0
Black-faced Woodswallow *Artamus cinereus*		0
Grey Butcherbird *Cracticus torquatus*		R
Australian Magpie *Gymnorhina tibicen*	+	R
Australian Raven *Corvus coronoides*		R

Water Authority
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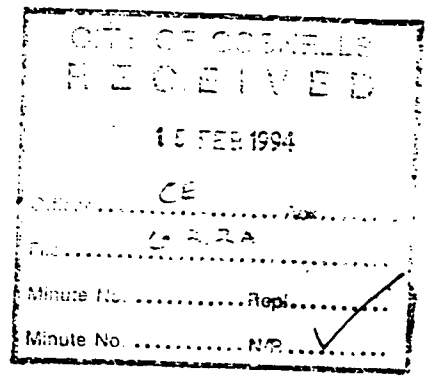
Your Ref
Our Ref A 17150
Enquiries R Bretnall
Tele Direct 420 2905

Town Clerk
City of Gosnells
Locked Bag 1
GOSNELLS WA 6110

(Attention: Mr Glyn Davies)



Dear Sir,

PROPOSED SPENCER ROAD BRIDGE

I refer to our letter dated 22nd December 1993 regarding the proposed Spencer Road bridge across the Southern River. In that letter we recommended that the existing timber Spencer Road bridge be removed and gave appropriate reasons.

However, it is important to note that there is no immediate need to remove the existing timber bridge as the proposed double bridge configuration conforms with our guidelines for acceptable development within the floodplain.

In the long term, when the existing timber bridge becomes economically unviable to maintain, then removal of the bridge is recommended. Any future replacement bridge should be designed with a much lesser hydraulic headloss.

Patrick L. George

P GEORGE
SUPERVISING ENGINEER
FLOODPLAIN MANAGEMENT & STRATEGIC DRAINAGE PLANNING

10th February 1994
rbre241

Water Authority
of Western Australia

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Our Ref A 17150
Enquiries R Bretnall
Tele Direct 420 2905

CMPS & F
PO Box 6311
EAST PERTH WA 6892

(Attention: Tanya Astbury)

Dear Madam,

SOUTHERN RIVER FLOOD STUDY
PROPOSED SPENCER ROAD BRIDGE

The Water Authority in carrying out its role in floodplain management provides advice and recommends guidelines for development on floodplains with the object of minimising flood risk and damage.

The Southern River Flood Study indicates the extent of flooding that can be expected to occur from a 1% average probability flood or what is more commonly known as the 100 year flood. This is a flood of a magnitude that is expected to occur, on average, once every 100 years and has generally been adopted in Australia and overseas as the basis for sound floodplain management planning.

The study also recommends a floodplain development strategy for development on, and adjacent to, the floodplain. The strategy includes, inter alia, the delineation of the floodplain into **floodway** and **flood fringe** areas:

* the **floodway** is that part of the floodplain where development (such as filling, building, etc) should not obstruct major river flows as this would increase flood levels upstream.

* the **flood fringe** is floodprone land where development is considered hydraulically acceptable.

The increase in flood level that will result from development of flood fringe areas and the construction of any future bridges should be no greater than 0.15 metre during a 100 year flow.

The following table summarises the estimated 100 year flood levels for the existing situation and for the future situation when all flood fringe areas have been developed and the proposed Spencer Road bridge has been constructed:

	As existing situation (m AHD)	Total flood fringe development with proposed Spencer Road bridge (m AHD)
Just downstream of Spencer Road	5.89	6.01
Just upstream of Spencer Road	6.27	6.43 *

* The proposed Spencer Road bridge has an afflux of 0.08 metre during a 100 year flow.

Therefore the proposed Spencer Road bridge in conjunction with the existing timber Spencer Road bridge essentially conforms with our floodplain development guidelines and is therefore considered acceptable.

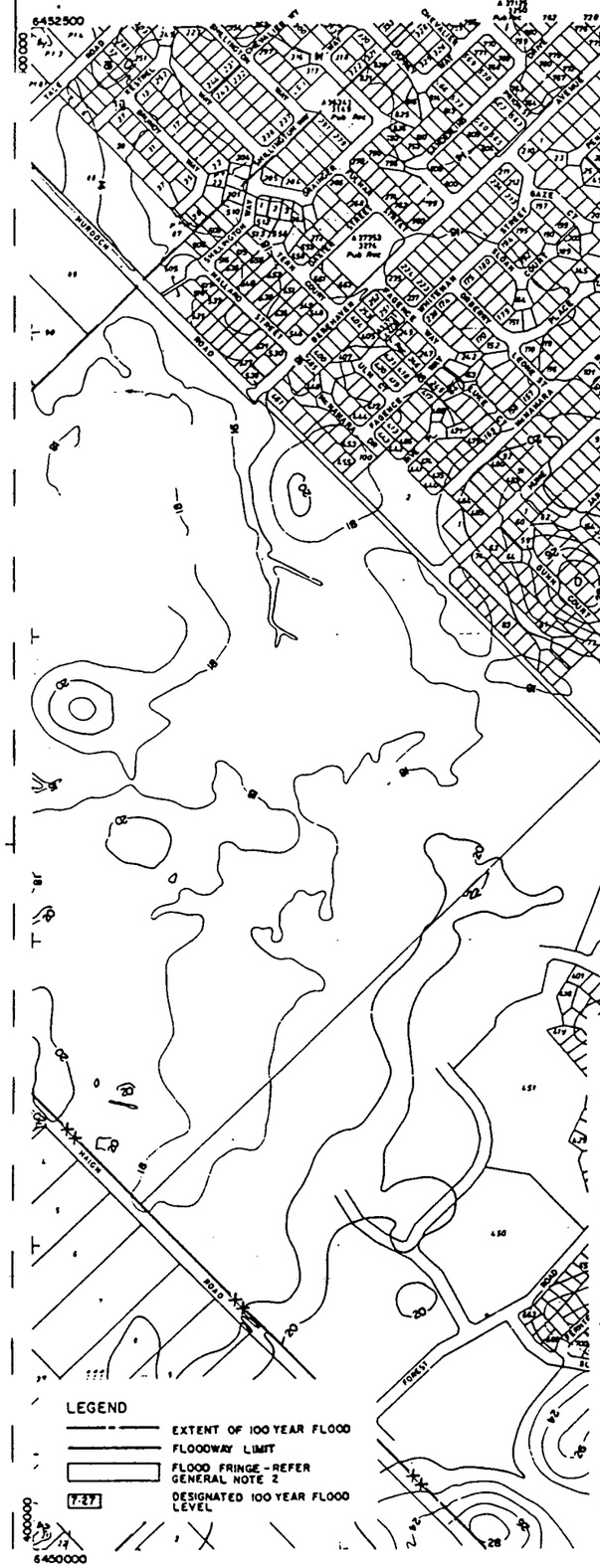
However, it is recommended that the the existing timber Spencer Road bridge is removed because:

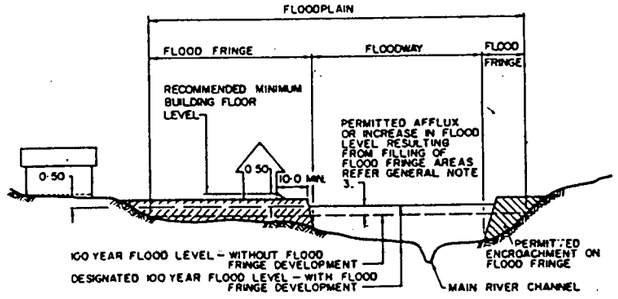
- the 100 year flood level will decrease by approximately 0.30 metre in the area just upstream of Spencer Road, and
- it will allow the possible future bridge at Princess Street (approximately 470 metres upstream) to be designed with a larger headloss when compared to the situation when there are two bridges at Spencer Road.

Patrick L. George

P GEORGE
SUPERVISING ENGINEER
FLOODPLAIN MANAGEMENT & STRATEGIC DRAINAGE PLANNING

22nd December 1993
rbre238





RECOMMENDED FLOODPLAIN DEVELOPMENT STRATEGY

GENERAL NOTES

UNLESS OTHERWISE SHOWN ALL DIMENSIONS ARE IN METRES.

1. THE PHYSIOGRAPHIC STATE OF THE RIVER AS IT EXISTED IN 1984 HAS BEEN USED TO COMPUTE FLOOD LEVELS SHOWN.
2. THE FLOOD FRINGE IS AN AREA AFFECTED BY A 100 YEAR FLOOD THAT MAY BE CONSIDERED FOR DEVELOPMENT.
3. THE INCREASE IN FLOOD LEVEL THAT WILL RESULT FROM DEVELOPMENT OF FLOOD FRINGE AREAS HAS BEEN CALCULATED TO BE NO GREATER THAN 0·15m.
4. PORTIONS OF THE FLOODPLAIN RECOMMENDED FOR THE ESTABLISHMENT OF A FLOODWAY MAY BE USED FOR PARKS AND RECREATION. HOWEVER, SUCH DEVELOPMENT SHOULD NOT IN ANY WAY CONSTITUTE AN OBSTRUCTION TO FLOOD FLOWS.

100 50 0 100 200 300 METRES

ORIGINAL DRAWING SIZE	ISSUE	DATE	GRID	REVISION	DRN	APPD
A1	A	26-3-90	B/G-10	ALTERED EXTENT OF FLOOD & FLOODWAY LEVELS	C.M.M.	

SURVEY BOOKS: L.B. 32682, L.B. 32683, L.B. 32709, L.B. 32760, L.B. 32761, L.B. 32762, L.B. 32763, L.B. 32934

DATUM A.H.D. | SCALES AS SHOWN | MICROFILMED | DES R.B. CHD P.L.G. | DRN K.B. CHD E.M.B. | DATE 10-10-90

NORTH POINT

SHEET INDEX: 3-1A, 3-2A, 3-3A, 3-4A

RECOMMENDED [signature] 29-11-90 SUPERVISING ENGINEER

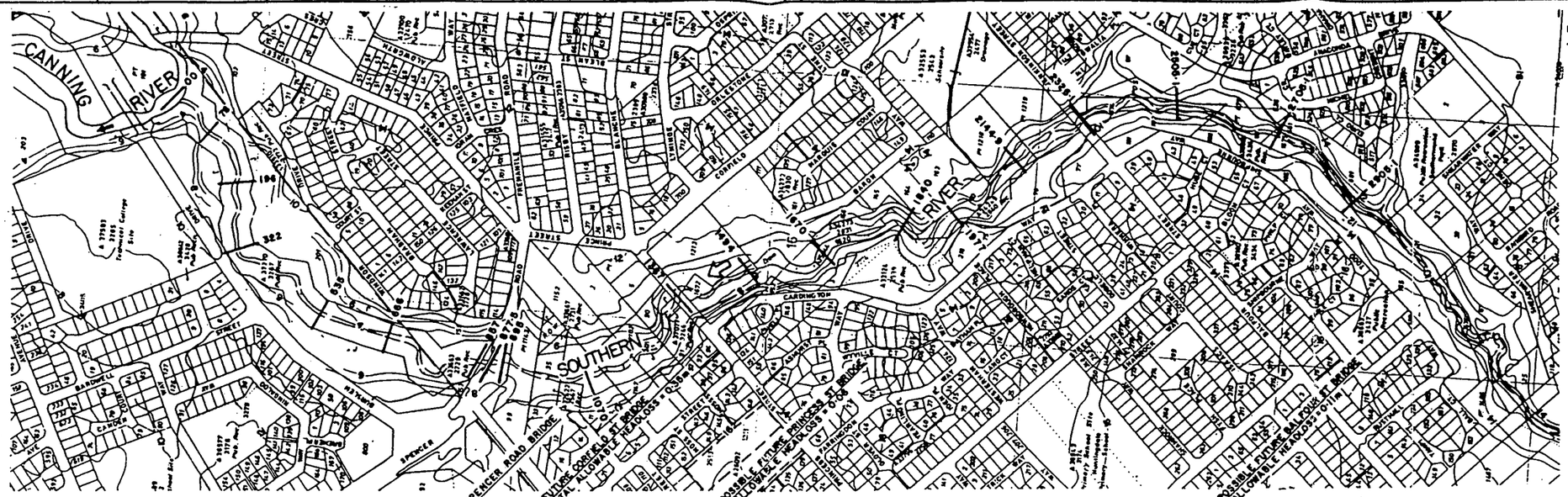
APPROVED [signature] MANAGER, SURFACE WATER

Water Authority of Western Australia

SOUTHERN RIVER – WUNGONG BROOK FLOOD STUDY
CANNING RIVER TO SOUTH WESTERN HIGHWAY
DESIGNATED FLOODWAY & LEVELS – 100 YEAR FLOOD

FILE A17150 | PROJECT | PLAN AF07-3-1 | ISS A

FORM 1034



DESIGN FLOW - CUBIC METRES/SEC - 100 YEAR 73.0

- 25 YEAR 55.0

ROUGHNESS - MANNING'S 'n' 0.080

REFER P.W.D., W.A. 47940-4-3 FOR WATER LEVEL DETAILS IN THE CANNING RIVER.

0.0 METRES ABOVE DATUM

DESIGNATED FLOOD LEVEL – FLOODWAY	5.31	5.31	5.39	5.48	5.60	5.73	5.98	6.01	6.36 6.36	6.55	6.86 6.92	7.27	7.93	8.37	8.75	9.08	9.36 9.47	10.00	10.59	11.08	
100 YEAR WATER LEVEL RIVER AS EXISTING	5.27	5.27	5.34	5.38	5.54	5.66	5.86	5.89	6.26 6.27	6.40	6.77	7.18	7.93	8.35	8.75	9.05	9.32	9.93	10.54	11.04	
25 YEAR WATER LEVEL RIVER AS EXISTING	5.03	5.03	5.09	5.13	5.28	5.40	5.61	5.64	5.87 5.88	6.05	6.51	6.96	7.67	8.06	8.43	8.75	9.04	9.66	10.27	10.79	
AVERAGE VELOCITY METRES / SEC 100 YEAR			0.57	0.28	0.44	0.51	0.47	0.54	0.41	0.45	0.44	0.64	1.16	0.81	0.99	0.93	0.48	0.87	1.10	0.67	0.97
25 YEAR			0.50	0.24	0.39	0.46	0.43	0.50	0.40	0.44	0.44	0.61	1.05	0.73	0.87	0.86	0.45	0.80	1.00	0.62	0.88
EXISTING INVERT LEVEL		2.02	2.14	2.20	2.42	2.39	2.81	2.81	2.87	2.47	3.65	3.98	4.39	4.86	5.14	5.62	5.52	6.07	6.74	6.81	
WATERWAY DISTANCE	0.0	78.0	196.0	322.0	535.0	666.0	857.0	877.5	895.0	1070.0	1367.0	1494.0	1670.0	1840.0	1977.0	2144.9	2326.1	2505.1	2705.1	2905.1	3000.0

GENERAL NOTES

1. DESIGN FLOWS FOR THE SOUTHERN RIVER AND WUNGONG BROOK WERE CALCULATED BY HYDROLOGY BRANCH, WATER RESOURCE DIRECTORATE, WATER AUTHORITY OF WESTERN AUSTRALIA.
2. WATER SURFACE PROFILES WERE CALCULATED USING THE HYDRAULIC BACKWATER ANALYSIS PROGRAM 'IRWASP'
3. THE HYDRAULIC MODEL WAS CALIBRATED AGAINST THE ESTIMATED FLOW AND OBSERVED FLOOD LEVELS OF THE FLOO OF AUGUST 1964

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ISSUE	DATE	GRID	REVISION	DRN	APPD
A	23-4-90		ALTERED 25, 100 YEAR & DESIGNATED FLOOD LEVELS	Z.T.	

SURVEY BOOKS
L.B. 32682
L.B. 32683
L.B. 32709
L.B. 32760
L.B. 32761
L.B. 32762
L.B. 32763
L.B. 32783
L.B. 32838

DATUM: A.H.D.

DES. REF. C3F 01-006

DES. R.B. 6/104
CHD P.L.G.
DRN. K.B.
CHD E.H.B.

NORTH POINT

RECOMMENDED
DESIGN ENGINEER

APPROVED
for MANAGER, SURFACE WATER

Water Authority of Western Australia

SOUTHERN RIVER - WUNGONG BROOK FLOOD STUDY
CANNING RIVER TO SOUTH WEST HIGHWAY
25 & 100 YEAR WATER SURFACE PROFILES

FILE A17150
PROJECT
PLAN AF07-4-1
ISSUE A

ORIGINAL SHEET SIZE A1

CITY of GOSNELLS

SOUTHERN RIVER BRIDGE PROJECT

NOISE IMPACT STUDY

Prepared by
Vipac Engineers & Scientists Ltd
May 1993

VIPAC

Executive Summary

This study evaluates the noise impact of the proposed bridge and road re-alignment for the Southern River Bridge Project. The L10 (18 hour) noise level changes due to the road re-alignment and the predicted changes in the traffic volumes in the years 1995, 2006 and 2034 have been assessed for properties adjacent the project area.

With the exception of one location the change in road location results in a lower noise levels. The predicted noise levels along Prince Street are between 2 to 10 dBA lower after the project finishes in 1995 than the existing noise levels. The predicted noise levels along Fremantle Road adjacent the project area are between 6 to 9 dBA lower after the project finishes in 1995 than the existing noise levels.

The maximum noise levels in the year 2034 at the above locations is 67 dBA. This is below the desired maximum level of 68 dBA and is also below current noise levels.

The relocation of the road and increased traffic volumes will result in higher noise levels at residences in Yulan Court. The predicted noise level at Block 33 is 6 dBA higher after the project finishes in 1995 than the existing noise level. In the year 2034, the noise level predicted at this location is 64 dBA, 8 dBA above the existing noise level but 4 dBA below the desired maximum level of 68 dBA.

The predicted noise levels do not exceed 68 dBA at residences adjacent to the project area for the predicted traffic volumes hence no noise control measures are required.

Table of Contents

1. Introduction

Vipac was commissioned by the City of Gosnells to conduct a study to determine noise impact of the proposed bridge and road realignment for the Southern River Bridge Project. The project involves the construction of a 4 lane bridge over the Southern River and associated roadwork to link Spencer Road into Corfield Street as per Plan No. CV/S 68 7th January,1993.

2. Methodology

2.1 Noise Prediction Study

The noise calculations were conducted in accordance with the methodology outlined in the "Traffic Noise Study - Guidelines" (draft) from the Main Roads Department of W.A (4th May 1993). This requires the noise predictions to be calculated using the methodology outlined in the document published by the U.K. Department of Transport (1988) - "Calculation of Road Traffic Noise". Corrections where made for Australian conditions according to the study by the Australian Road Research Board, March 1983 - "An Evaluation of the U.K. DoE Traffic Noise Prediction Method".

The calculations of the L_{10}(18 hour) noise levels were based on the following;

1. Traffic speed of 60 km/hr
2. A dense graded asphalt road surface
3. The traffic included 8% heavy vehicles.
4. The ground condition was predominantly soft between the source and receiver.
5. The receiver is at the front of a house at the minimum set back of 7.5 metres

The noise criteria is an L_{10}(18 hour) not to exceed 68 dBA.

2.2 Traffic Predictions

The noise prediction calculations are based on the existing and forecast traffic volumes supplied by the City of Gosnells. The traffic volumes are presented in the following table:

	Existing Traffic Volume vpd	Forecast Traffic Volume Yr 1995 vpd	Forecast Traffic Volume Yr 2006 vpd	Forecast Traffic Volume Yr 2034 vpd
Spencer Road at new bridge site	24,000	24,800	35,500	44,100
Fremantle Road near Corfield Street	14,300	13,400	10,400	17,600
Corfield Street near Fremantle Road	9,000	10,800	27,600	35,300

Table 1: Existing and Forecast Traffic Volumes - vehicles per day (vpd)

2.3 Traffic Noise Measurements

The L_{10} noise level was evaluated in accordance with the methodology outlined in the document published by the U.K. Department of Transport (1988) - "Calculation of Road Traffic Noise".

Noise measurements were recorded at a location along Fremantle Road approximately 200 metres east of the existing bridge. The measurement was taken at a position 22 metres from the road kerb on 29 September 1992. The ground condition was sandy with some low level ground cover. The environmental conditions were fine with light winds.

A Larson Davis 700 Sound Level Meter, Serial Number 1523, was used for the measurements. This unit has a current N.A.T.A. calibration certificate and was checked before and after the measurements using a Larson Davis CA250 calibrator.

3. Results

3.1 Noise Prediction Study

The following table presents the results of calculations to determine the noise levels at receiver locations approximately 7.5 metres from the property boundary facing the road and in front of a facade.

BLOCK	CALCULATED NOISE LEVELS in dBA			
	1993	1995	2006	2034
FREMANTLE ROAD				
114	70	62	63	64
113	71	62	63	64
112	71	62	63	64
111	72	63	63	65
110	72	63	63	65
109	72	64	64	66
2727	72	66	65	67
PRINCE STREET				
62	68	66	65	67
61	67	61	61	63
60	67	59	60	61
59	67	58	59	61
37	67	57	60	61
36	67	57	61	62
30	67	59	62	63
31	66	61	65	66
YULAN COURT				
33	56	62	63	64

Table 1: Calculated (L_{10}(18 hour) Noise Levels at Specified Locations

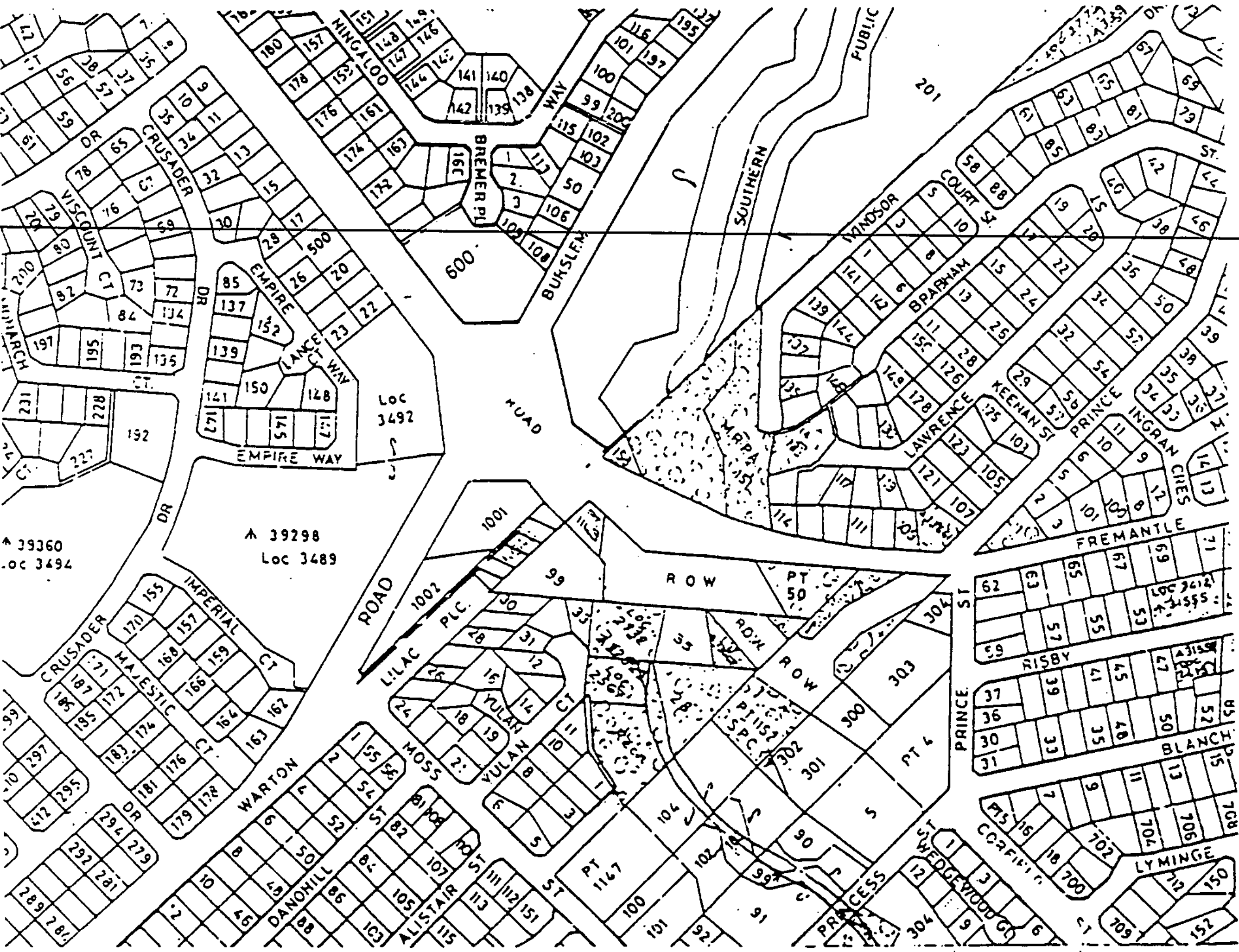
3.2 Traffic Noise Measurements

The measured L_{10}(18 hour) noise level was 63 dBA. The predicted L_{10}(18 hour) noise level was 64.6 dBA at the same distance of 22 metres from the road kerb.

The Australian Road Research Review Board indicates the accuracy of the predicted noise levels is +/- 3.6 dBA for 95% confidence limits. The 1.6 dBA difference between the measured and predicted is, therefore, within the accuracy of the prediction method.

4. Noise Reduction Measures

The noise levels at all considered locations surrounding the project area did not exceed 68 dBA therefore no noise control measures are considered necessary for these locations.


NINGALOO WAY
BREMER PL
BUKSLEM
SOUTHERN
PUBLIC
WINDSOR COURT
BRAPHAM
LAWRENCE
KEENAN ST
PRINCE
INGRAN CRES
FREMANTLE
RISBY
BLANCH
LYMINGE
CRUSADER
VISCOUNT CT
EMPIRE DR
LANCE CT WAY
EMPIRE WAY
Loc 3492
ROAD
39298
Loc 3489
39360
Loc 3494
IMPERIAL CT
MAJESTIC CT
CRUSADER DR
WARTON
DANOHILL ST
ALISTAIR ST
MOSS
YULAN CT
LILAC PLC.
ROW
M.R.P.A.
PRINCE ST
PRINCESS
WEDGEWOOD
CORFIELD

CITY OF GOSNELLS

CONSULTANCY BRIEF

NOISE IMPACT ASSESSMENT

1. PROJECT NAME: SOUTHERN RIVER BRIDGE
SPENCER ROAD/CORFIELD STREET
GOSNELLS

2. PROJECT DESCRIPTION:

The project involves the construction of a 4-lane bridge over the Southern River and associated roadworks to link Spencer Road into Corfield Street.

3. STUDY OBJECTIVES:

The objective of this study is to determine the noise impact of the road realignment and bridge proposals on residential and open space properties in the vicinity of the project and outline possible means of minimising this impact through noise reduction methods and development control. This assessment is required for the development of an environmental assessment and management plan for the proposed Southern River Bridge project. A concept plan (Plan No.CV/S64 Sheet 2) of the project area is attached.

Existing and forecast traffic volumes are as shown in the following table:

	Existing Traffic Volume vpd	Forecast Traffic Yr 2006 vpd	Forecast Traffic Yr 2034 vpd
Spencer Road at new bridge site	24,000	35,500	44,100
Fremantle Road near Corfield Street	14,300	10,400	17,600
Corfield Street near Fremantle Road	9,000	27,600	35,300

vpd = vehicles per day

4. STUDY DETAILS:

4.1 Properties - Calculations and recommendations are to be included for residential properties and open space areas adjoining the project site and others where appropriate.

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4.2 Traffic Noise Calculations - For the purpose of this study the method used will be the UK Department of Environment Method, corrected where necessary according to the 1983 NAASRA evaluation study. Other factors to be used in the noise calculation are:

* Descriptor	-	L10 (18 hour)
* Speed Zone	-	60 km/h
* Road Surface	-	dense-graded asphalt
* Heavy Vehicles	-	8%

4.3 Scenarios - Calculations are required for existing conditions, and those that are most likely to occur in the years 1993 (with the project in place) and 2000.

4.4 Impact Criterion - Future noise levels are to be assessed for both the expected change in acoustic environment if no noise attenuation measures are adopted and the expected noise levels at critical points if the recommended noise reduction measures are adopted, bearing in mind the Council's general objective of maintaining traffic noise levels at less than 68 dB(A).

4.5 Noise Reduction Measures - Outline all suitable available options, indicate where they might be necessary and their possible effectiveness at specific residential and open space locations within the road reserve. Give recommendations as to which measures should be implemented.

4.6 Development Control - Suggest noise reduction measures and controls that can be implemented to ensure that future residential developments provide a suitable acoustic environment for residents.

5. REPORT FORMAT:

5.1 The report shall be:

* Typed on A4 size paper with the appropriate mapping.

* Include an executive summary which provides a precis of the total report. It is intended that this summary may be used as a general information document for public issue.

5.2 Four hard copies of the report shall be provided.

5.3 A draft report shall be submitted for comment before the final report is produced.

6. ACCESS:

Consult with the City Engineer prior to conducting any field work which entails gaining access to private land or land which is not generally open to members of the public.

.../3

7. QUOTATION:

The quotation will be in the form of a lump sum and shall include all costs payable by the Council. An itemised breakdown of the price shall be included.

8. CONFIDENTIALITY:

This brief, and the results of all work carried out under this consultancy are confidential and cannot be released without permission of the Council.

9. GENERAL CONDITIONS:

9.1 Unless specifically referred to in the brief, the Consultant does not have access to Council equipment or facilities.

9.2 The Consultant is not excluded from any legal obligations to obtain licences and permits which may be necessary to complete the commission.

9.3 Public liability insurance, workers' compensation and income tax are the responsibility of the Consultant.

10. TIMING:

Quotations for the work detailed in this brief shall reach the:

Town Clerk
City of Gosnells
Locked Bag No.1

or

2120 Albany Highway
GOSNELLS 6110

by not later than 12 noon on Friday 14th February, 1992.

The Consultant shall state availability to commence work immediately and the approximate length of time required to complete the investigation and report.

11. REFERENCES:

1. Department of Environment (1975) - "Calculation of Road Traffic Noise", HMSO.

2. NAASRA (1983) - "An Evaluation of the UK DoE Noise Prediction Method", Australian Road Research Board.

REFERENCES

Ethnographic Survey for Southern River Bridge Spencer Road/Corfield Street Gosnells, Barrie Machin Tamora Pty Ltd, April 1992.

Aboriginal Site Survey Southern River Bridge, Louise J Bauch Tamora Pty Ltd, April 1992.

Report on a Meeting of Aboriginal Informants Southern River Bridge, Spencer Road/Corfield Street Gosnells Barrie Machin Tamora Pty Ltd, February 1993.

Noise Impact Study Southern River Bridge Project, Vipac Engineers & Scientists Ltd, May 1993.

Biological Survey Southern River Bridge and Spencer Road/Corfield Street Link, E.M. Goble-Garrett and MJ & AR Banford, May 1992.

Correspondence by Patrick George of Water Authority of Western Australia.