

**END**



## 1 INTRODUCTION

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Arcus GIBB (Pty) Ltd was appointed by Crimson River Investments (Pty) Ltd to investigate the provision of engineering services for the Crimson Park development on Erf 3948 and Erf 5712, Beacon Bay, East London. It is the intention of the developer to have these erven rezoned from *Agriculture* to *Business Zone 1* in accordance with the Buffalo City Municipality (BCM) Zoning Scheme.

This report forms a summary of the conclusions derived after the feasibility stage investigation into the provision of these services.

## 2 PUBLIC ROADS

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It is proposed that the existing public access collector which traverses the Triple Point development will be extended towards the east. The proposed Crimson Park development will be accessed from this road, which lies to the north east of Erf 3948 and Erf 5712. There is no direct access onto Quenera Drive – one will turn off of Quenera Drive and onto the public access collector at the main traffic circle to Triple Point, then proceed along this route to the proposed development.

The public access collector will have a road reserve width of 16m, and the road will be surfaced to match existing. The road will be designed to accommodate the design traffic, and will fulfil all BCM requirements.

## 3 INTERNAL PRIVATE ROADS

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A servitude right of way will be created across Erf 817/53, to extend from the main public access collector to the proposed development. The width of this right of way is indicated as 8 metres on the Draft Site Development Plan – refer to the red dashed lines.

An internal private road is proposed for Erf 3948, as indicated on the draft site development plan.

## 4 STORMWATER CONTROL

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The drainage design will be conducted using the Rational Method and the rainfall intensity-duration-frequency curves for East London, with a 50-year return period.

The site drains towards the Quenera River. The 1:100 year flood line has already been determined by others, prior to the construction of the Quenera Bulk Outfall Sewer. The flood line does not encroach on either of the proposed development sites. The lowest point on Erf 5712 lies approximately 250m away from the flood line, while the lowest point on Erf 3948 lies approximately 190m away from the flood line.

The outflow from the stormwater detention ponds cannot be discharged directly into a water course, as neither erf drains into such. The pond outlets will have to drain into



the municipal stormwater network at an appropriate point along the proposed extension to the public access collector. It should be noted that, in order for stormwater from Erf 3948 to reach the municipal infrastructure, a stormwater servitude will be required across Erf 817/53.

A separate Stormwater Management Plan has been compiled to quantify the necessary measures to control stormwater discharge, as per BCM guidelines.

## **5 WATER**

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Both sites will be supplied from the BCM water network. BCM confirmed previously that a bulk supply main will be constructed parallel to Quenera Drive, to serve all proposed adjacent developments (refer to attached letter). This water main has been partially installed already, currently terminating at the traffic circle access to Triple Point.

All works shall be designed and constructed in accordance with the BCM Water Branch specifications.

## **6 SEWERAGE**

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Allowance has been made for the inclusion of effluent from the developments along Quenera Drive into the Quenera Bulk Outfall Sewer. This has been confirmed in correspondence from the BCM Sanitation Division. This bulk outfall sewer lies to the north east of Erf 3948 and Erf 5712, at a distance of approximately 190m as the crow flies.

It was anticipated that the existing septic tanks would be utilised until such time as it became necessary to connect to the municipal infrastructure. BCM Sanitation does not however support this idea. Where bulk outfall sewers have been constructed, it is required that developments connect to this infrastructure.

In order to connect to the Quenera Bulk Outfall Sewer, it would be necessary to establish sewer servitudes across neighbouring erven. In the event that other municipal sewerage infrastructure is constructed prior to the establishment of this particular development, it may be possible to connect into such, instead of directly into the bulk outfall sewer. This would require further investigation during the design phase.



## **7 ELECTRICITY**

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The development lies within the bounds of the BCM electricity supply area. It has been confirmed that both erven are already serviced. Medium voltage (MV) overhead lines as well as cables traverse this land. Registration of electricity servitudes will be a requirement.

The local network is of sufficient capacity to accommodate proposed developments along Quenera Drive. In the event that the current supply is inadequate for the intended land use, application for the upgrade thereof may be made to BCM.

## **8 REFUSE COLLECTION**

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Refuse collection trucks will access the development via the proposed public access collector and servitude right of way.

## **9 CONCLUSION**

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Arcus GIBB (Pty) Ltd has undertaken an investigation into the availability and capacity of BCM services to accommodate the Crimson Park development, and is able to conclude that the proposed development can be provided with engineering services.

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## **APPENDICES**

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DRAFT SITE DEVELOPMENT PLAN

LOCALITY PLAN

BCM LETTER (REF 14563/WW) : AVAILABILITY OF BULK WATER SUPPLY



**DOCUMENT CONTROL SHEET  
(FORM IP180/B)**

**CLIENT** : Crimson River Investments (Pty) Ltd  
**PROJECT NAME** : CRIMSON AND SQUIREWOOD **PROJECT No.** : J30114  
**TITLE OF DOCUMENT** : REPORT ON ENGINEERING SERVICES FOR CRIMSON PARK :  
 PROPOSED REZONING OF ERF 3948 AND ERF 5712, EAST LONDON  
**ELECTRONIC LOCATION** : P:\J30114\_Crimson & Squirewood\3-Tasks\Reports\J30114 - Engineering Services  
 Report.doc

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DATE <b>21 JULY 2010</b>	SIGNATURE	SIGNATURE	SIGNATURE

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DATE	SIGNATURE	SIGNATURE	SIGNATURE

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**APPROXIMATE ELECTRICITY DEMAND (based on Eskom design guidelines, discussion with Senior Design Technician)**

Category	Use per unit	Units	Total
Residential dwellings	10.5 KVA / DU	5 DU's	53 KVA
Offices	120VA / m <sup>2</sup>	920 m <sup>2</sup>	110 KVA
<b>TOTAL DEMAND</b>			<b>≈ 200 KVA</b>

NOTE : In the event that the land usage is altered, and say a supermarket is constructed, approximately 800KVA would be required.

**APPROXIMATE SOLID WASTE DEMAND (based on South African Environmental Outlook - DEAT, 2006)**

Category	kg waste generated / person / day	No. of persons	Total	
Residential - low income	0.41	0	0	kg/day
Residential - medium income	0.74	0	0	kg/day
Residential - high income	1.29	20	26	kg/day
Business / offices	1.7	61	104	kg/day
<b>TOTAL DEMAND</b>			<b>130</b>	<b>kg/day</b>

\* 4 persons per dwelling unit

\* 1 person per 15m<sup>2</sup> / total of 920m<sup>2</sup>

NOTE : Demands based on very limited land use information available at the time

**CRIMSON PARK ESTIMATED WATER AND SANITATION FLOW CALCULATIONS**

**Water Consumption Data**

Item	Unit	Demand per Unit (l/day)	Quantity	Total Demand (kl/day)
Flat/Apartment	No	300	0	0.0
Cluster/Town House	No	500	0	0.0
House (< 1000m <sup>2</sup> plot)	No	700	0	0.0
House (< 2000m <sup>2</sup> plot)	No	1000	5	5.0
House (> 2000m <sup>2</sup> plot)	No	1500	0	0.0
Retail	100 m <sup>2</sup> GLA	640	920	588.8
Office	100 m <sup>2</sup> GLA	400	0	0.0
Industrial	ha	20000	0	0.0
Hospital	bed	500	0	0.0
Schools	learner	100	0	0.0
Church	ha	2000	0	0.0
Hotel	ha	200	0	0.0
Fields	ha	10000	0	0.0
<b>Total</b>				<b>593.8</b>

Average Annual Daily Demand (AADD) **6.87 l/s**  
 Instantaneous Peak Factor **1.9**  
 Summer Peak Factor **1.5**  
**13.35 l/s**  
**20.03 l/s**  
**1453.5 kl/day**  
**1730.3 kl/day**

**Equivalent Erven**

**594**

Moderate Fire Risk Area

33.3 l/s

	AADD (l/day)	AADD (l/s)	Peak Demand(l/s)
House	5000	0.06	0.11
Retail	588800	6.81	13.24
	593800	6.87	13.35

**Sewage Effluent Production**

Item	Unit	Effluent per Unit (l/day)	Quantity	Total Flow (kl/day)
Flat/Apartment	No	270	0	0.0
Cluster/Town House	No	450	0	0.0
House (< 1000m <sup>2</sup> plot)	No	630	0	0.0
House (< 2000m <sup>2</sup> plot)	No	900	5	4.5
House (> 2000m <sup>2</sup> plot)	No	1350	0	0.0
Retail	100 m <sup>2</sup> GLA	576	920	529.9
Office	100 m <sup>2</sup> GLA	360	0	0.0
Industrial	ha	18000	0	0.0
Hospital	bed	450	0	0.0
Schools	learner	90	0	0.0
Church	ha	1800	0	0.0
Hotel	ha	180	0	0.0
<b>Total</b>				<b>534.4</b>

Average Daily Flow **6.19 l/s**  
 Extraneous Flow Factor **1.15**  
**7.11 l/s**  
**534.4 kl/day**  
**614.6 kl/day**

# **Geo-Technical Report**



**GEOTECHNICAL DESKTOP STUDY  
FOR  
CRIMSON AND SQUIREWOOD  
DEVELOPMENTS, EAST LONDON  
EASTERN CAPE PROVINCE**

**JULY 2010**

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## **1. SCOPE**

The scope of the report is an initial geotechnical report to be submitted as part of the application to develop the site. The geotechnical assessment is done in accordance to items 5a to 5m of the Regulation 26: Geotechnical Assessment. The site to be developed is situated in the suburb of Beacon Bay, East London in the Eastern Cape Province. This report has bearing on both the Crimson and Squirewood developments. The Crimson development will be a commercial site and the Squirewood a residential development.

## **2. AIM OF REPORT**

The aim of the report is to make a recommendation to the tribunal as to whether a comprehensive geotechnical report should be prepared.

## **3. DESK STUDY**

The initial report is based on the 1:250 000 geological map series as published by the Chief Director of Surveys and Mapping. According to the geological map, the site under investigation falls within the Karoo Sequence represented by the Ecca Group and the Beaufort Group. The Beaufort Group is subdivided into the Tarkastad and Adelaide Subgroups. These subgroups generally consist of sedimentary rocks of mudstones, sandstones with some dolerite dyke intrusions.

### **3 (a) *Dolomitic Rocks***

The materials occurring on this site should not be susceptible to solution and the likelihood of sinkholes forming is remote.

### **3 (b) *Undermined***

No indication of the presence of undermined ground was found during the desk study.

### **3 (c) *Located on Clays which will Shrink and Swell***

The mudstone and shale found in the area can break down to clayey material. Tests performed on this type of material on projects within the same suburb indicated a

medium risk of heave. This can be prevented by addressing the site drainage to prevent water ponding on or ingress into the residual material.

Through addressing the side drainage the risk associated with heave can be mitigated, but it must be noted that the thickness of the expansive clayey material can be in excess of 3m.

### **3 (d) Collapse of Grain Structure**

The Wienerts climatic N value for the area is less than 2, which should indicate that the rocks would decompose implying that chemical weathering would dominate over mechanical weathering. The material susceptible to collapse is the mudstone and shale. The risk of collapse can be reduced by addressing the site drainage.

### **3 (e) Occurrence of Seep Areas and Drainage Channels**

No major drainage channels were identified during the desk study. The sites slope generally to the northern and eastern side towards the Quenera River. The proposed layout of the development will not influence the existing drainage channels negatively and should not impact on the development.

### **3 (f) Position of 1:50 Year Floodline**

The Quenera River runs to the north western side of the proposed developments. The 1:50 year floodline must be taken into account in the proposed development.

### **3 (g) Water Tables**

The existence of a perched water table will be determined during a site investigation. Based on the geology of the area, it must be noted that water bearing dolerite intrusions are found in the Beacon Bay area.

### **3 (h) Slope instability on the natural ground surface**

No indications of the presence of unstable natural slopes were found during the desk study. The slopes on the site are not steep enough to affect the proposed development.

**3 (i) Suitability of the Local Materials for Construction of and the Construction on Earthworks**

The Wienerts climatic N value for the area is less than 2, which should indicate that the rocks would decompose implying that chemical weathering would dominate over mechanical weathering. The mudstone must be tested prior to be used as materials for sub-floors or in the road prism. The sandstone should not pose any problems and depending on test results could be used for the road prism as well as for the sub-floors in the structures.

**3 (j) Depth of Excavations**

No problems are anticipated regarding excavations by Tractor Loader Backactor (TLB).

**3 (k) Permeability**

Both the shale and mudstone materials found in the area are dense in structure and permeability should be low.

**3 (l) The Occurrence of Areas of Outcrop and Sub-outcrop and their Effect on Excavation**

Dolerite outcrops/intrusions are present within the grater East London area and may be water bearing. These intrusions should not pose any problems with regards to excavations.

**3 (m) Foundations**

Normal to modified normal foundations should be sufficient for the residential development proposed for the Squirewood site. The storm water must be addressed and prevented from ponding on the mudstone and shale.

**4. DISCLAIMER**

This investigation is aimed at providing the engineers and developers with prior warning of the prevailing engineering geological conditions on site. The desk study does not replace the requirement to determine the swell or collapse potential of some of the residual materials (mudstone/shale) found on the site.

While every effort has been made during the desk study to identify the various geotechnical factors, it is impossible to guarantee that isolated zones of poorer material do not exist. The investigation was, however, thorough and conditions are not expected to vary from those described in this report.

The Engineer is strongly urged to inspect all excavations during the construction phase and to assure them that conditions are not at a variance with those described in this report. Disparities in founding material type should be referred to an expert.

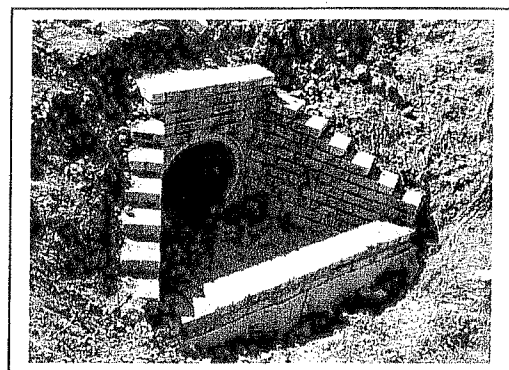
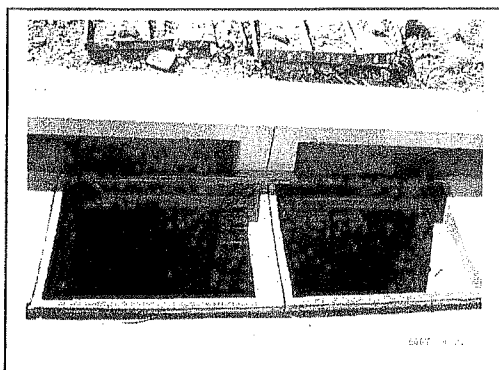
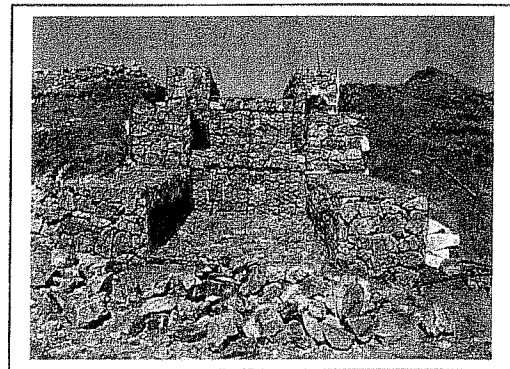
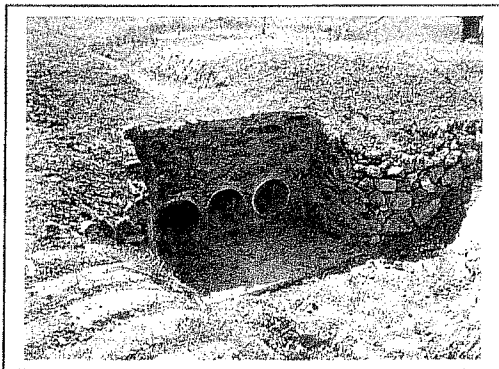
## **5. RECOMMENDATION**

It is recommended that the site be developed as no adverse conditions totally prohibiting the construction of single or double story residential structures were identified and the site is economically and practically suitable for proposed development. The medium risk associated with the medium expansive clayey material must be taken into account in the foundation design.

**ANNEXURE H**  
**Stormwater Management Plan**

Crimson River Investments (Pty) Ltd

**Stormwater Management Plan  
for Crimson Park :  
Proposed Rezoning of Erf 3948 and Erf 5712, East London**



J30114

July 2010



We change lives





**STORMWATER MANAGEMENT PLAN FOR CRIMSON PARK :  
PROPOSED REZONING OF ERF 3948 AND ERF 5712, EAST LONDON**

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## 1 INTRODUCTION

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Arcus GIBB (Pty) Ltd was appointed by Crimson River Investments (Pty) Ltd to conduct a Stormwater Impact Assessment, and submit a Stormwater Management Plan for the proposed Crimson Park development on Erf 3948 and Erf 5712, Beacon Bay, East London. It is the intention of the developer to have these erven rezoned from *Agriculture* to *Business Zone 1* in accordance with the Buffalo City Municipality Zoning Scheme.

The aim of this assessment is to investigate the impact of the expected runoff from the proposed developed erf, and to specify the required stormwater detention measures. Whilst a final stormwater infrastructure design does not form part of this report, the design basis and methodology is provided.

## 2 PROPOSED DEVELOPMENT

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The proposed development consists of two separate erven as follows (refer to the attached Draft Site Development Plan) :

Erf 3948 :

- a) 1 x existing building with approximately 382 m<sup>2</sup> GLA

Erf 5712 :

- b) 5 x existing buildings
- c) 1 x renovated building with approximately 538 m<sup>2</sup> GLA

It is proposed that the existing public access collector which traverses the neighbouring Triple Point development will be extended towards the east. This access collector will have a road reserve width of 16m, and the road will be surfaced to match existing. The proposed Crimson Park development will be accessed from this collector, which lies to the north east of Erf 3948 and Erf 5712. There is to be no direct access onto Quenera Drive.

For the purposes of this report, all roads are accepted as being surfaced. Mountable kerbs with kerb inlets and concrete pipe culverts would transport the minor storm runoff to the appropriate stormwater infrastructure.

Erf 3948 encompasses an area of approximately 4 609m<sup>2</sup>, while the total extent of Erf 5712 is approximately 5 835m<sup>2</sup>.



### 3 DESIGN PHILOSOPHY

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“Guidelines for Human Settlement Planning and Design” (Red Book) of August 2003, is used as a basis for the assessment. Use is also made of the “Drainage Manual” published by the South African National Roads Agency Ltd.

The 1:100 year flood line was determined by others, prior to the construction of the Quenera Bulk Outfall Sewer. It has been confirmed that the flood line does not lie on either of the proposed developments. The lowest point on Erf 5712 lies approximately 250m away from the flood line, while the lowest point on Erf 3948 lies approximately 190m away from the flood line.

Buffalo City Municipality provided the following requirements:

- On site containment of the post-development 1:50-year storm event flow rate ( $Q_{50}$ ), with a controlled release of not more than the pre-development 1:5-year event flow rate ( $Q_5$ ).
- Rainfall intensities of  $I_5 = 145\text{mm/h}$  and  $I_{50} = 225\text{mm/h}$
- Post-development Runoff Coefficient (C) = 0.9 – 1.0
- Pre-development Runoff Coefficient (C) = 0.4 – 0.5
- Time of concentration  $T_{C(50\text{ year})} = 15$  minutes (minimum).

The development consists of two erven. It is intended that each erf would detain its own stormwater by means of a pond and/or flooded parking areas, as appropriate.

An important aspect of the stormwater design would be the interception of any litter by means of grid outlets at the detention structures.

#### General Design Specifications:

- i. The rational method was used for runoff calculations.
- ii. The run-off coefficient (C) was accepted as 0.90 for post-development hardening and, due to areas of natural vegetation on site, 0.45 for pre-development calculations. An estimated area of hardening per development based on the *Draft Site Development Plan* (attached) is used to calculate post development runoff. No part of the land under consideration lies below the 1:100 year floodline, hence the site is considered fully developable.
- iii. The detention volumes were calculated using the Abt Grigg Formula. Storage volumes required must be the “dry volume” available. Outlet pipe capacity must limit the outlet flow to the 5-year storm flow.



## 4 DESIGN RESULTS

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The proposed *Stormwater Management Plan Layout* is indicated in Figure 1 – refer to Appendices. The design parameters, development data and calculation results are indicated in the *Stormwater Detention Calculation Sheet* attached, and can be summarised as follows:

### ERF 3948 :

Development Area	: 4 609 m <sup>2</sup>
Total Hardened Surface Area	: 4 609 m <sup>2</sup>
Pre-development 1:50 runoff (C=0.45)	: 0.130 m <sup>3</sup> /s
Post-development 1:50 runoff (C=0.9)	: <u>0.259</u> m <sup>3</sup> /s
Increase in runoff due to development	: 0.129 m <sup>3</sup> /s

<b>Total detention storage required</b>	<b>: 107 m<sup>3</sup></b>
Total detention storage provided	: 109 m <sup>3</sup>

<b>Maximum allowable pond discharge (Q<sub>5</sub>): 0.084 m<sup>3</sup>/s (83.5 l/s)</b>	
Calculated detention pond discharge	: 0.082 m <sup>3</sup> /s (82.8 l/s)

### ERF 5712 :

Development Area	: 5 835 m <sup>2</sup>
Total Hardened Surface Area	: 5 835 m <sup>2</sup>
Pre-development 1:50 runoff (C=0.45)	: 0.164 m <sup>3</sup> /s
Post-development 1:50 runoff (C=0.9)	: <u>0.328</u> m <sup>3</sup> /s
Increase in runoff due to development	: 0.164 m <sup>3</sup> /s

<b>Total detention storage required</b>	<b>: 136 m<sup>3</sup></b>
Total detention storage provided	: 137 m <sup>3</sup>

<b>Maximum allowable pond discharge (Q<sub>5</sub>): 0.106 m<sup>3</sup>/s (105.8 l/s)</b>	
Calculated detention pond discharge	: 0.094 m <sup>3</sup> /s (93.6 l/s)



## 5 RECOMMENDATIONS

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- i. Detention storage must be constructed per drainage regime, as indicated on the Stormwater Management Plan Layout, each with the following minimum *dry volume* and maximum outlet flow rate:

Drainage Regime	Detention Volume	Outlet Flow Rate
Erf 3948	107 m <sup>3</sup>	83.5 l/s
Erf 5712	136 m <sup>3</sup>	105.8 l/s

- ii. The detention pond on Erf 3948 will require vertical sides in order to accommodate a structure of adequate capacity on the land available. This may take the form of reinforced concrete walls, or concrete retaining block walls.
- iii. The detention pond on Erf 5712 may take the form of a grassed depression, with side slopes of 1:2. The pond will have a live storage of depth 1.5m. The depth of the pond at the south western bank will be approximately 1.1m deeper, owing to the natural slope of the site.

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## APPENDICES

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DRAFT SITE DEVELOPMENT PLAN

FIGURE 1 : STORMWATER MANAGEMENT PLAN LAYOUT

STORMWATER DETENTION CALCULATION SHEET



**DOCUMENT CONTROL SHEET  
(FORM IP180/B)**

**CLIENT** : Crimson River Investments (Pty) Ltd  
**PROJECT NAME** : CRIMSON AND SQUIREWOOD **PROJECT No.** : J30114  
**TITLE OF DOCUMENT:** STORMWATER MANAGEMENT PLAN FOR CRIMSON PARK :  
 PROPOSED REZONING OF ERF 3948 AND ERF 5712, EAST LONDON  
**ELECTRONIC LOCATION** : P:\J30114\_Crimson & Squirewood\3-Tasks\Reports\J30114 - Stormwater Management Plan.doc

	Approved By	Reviewed By	Prepared By
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DATE <b>15 JULY 2010</b>	SIGNATURE	SIGNATURE	SIGNATURE

	Approved By	Reviewed By	Prepared By
<b>REVISION</b>	NAME	NAME	NAME
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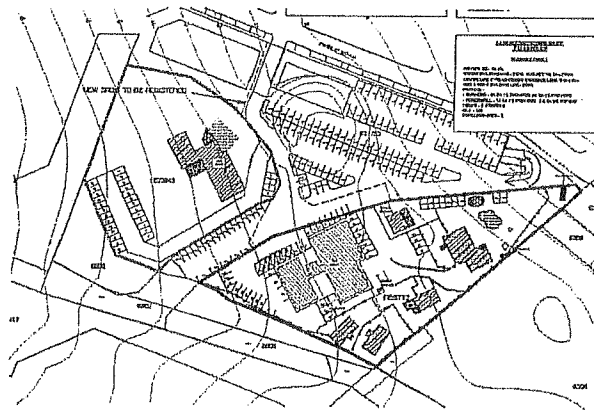
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**ANNEXURE I**  
**Traffic Impact Assessment**

**TRAFFIC IMPACT STUDY  
FOR PROPOSED  
REZONING  
OF  
ERVEM 3948 AND 5712  
BEACON BAY  
WITHIN  
BUFFALO CITY MUNICIPALITY**



**JULY 2010**

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## LIST OF ABBREVIATIONS

AM peak	Morning peak (normally 1 hour period)
BCM	Buffalo City Municipality
CBD	Central Business District
CD	Compact Disk
Deg Sat	Degree of Saturation
ECDOT	Eastern Cape Department of Transport
EB	Eastbound
FAR	Floor Area Ratio
GLA	Gross Leasable Area
ha	hectare
HCM	Highway Capacity Manual
HV	Heavy Vehicles
km/h	kilometre per hour
l/h	litres per hour (Fuel consumption)
LSDF	Local Spatial Development Framework
LOS	Level of Service (as defined by Highway Capacity Manual)
Mov No.	Movement number
NA	Not Analysed
NB	Northbound
pcu	passenger car units
ped	pedestrian
ped/h	pedestrians per hour
PHF	Peak Hour Factor
PM peak	Afternoon peak (normally 1 hour period)
POS	Public Open Space
PrOS	Private Open Space
SAT. peak	Saturday peak (normally 1 hour period)
SB	Southbound
SIDRA	Software for the design and evaluation of traffic/ pedestrian intersections
s/veh	seconds per vehicle
Sqm	Square metre
TIS	Traffic Impact Study
v/c	volume over capacity ratio
veh/h	vehicles per hour
WB	Westbound
Queue L	Queue length

## 1. INTRODUCTION AND BACKGROUND

Emonti Consulting Engineers was approached by Mr Deon Poortman on behalf of Crimson River Investments (Pty) Ltd to prepare a Traffic Impact Study (TIS) for the proposed rezoning of the following properties: erven 3948 and 5712, Beacon Bay – situated within East London. Emonti Consulting Engineers was subsequently appointed on 17 June 2010, by Mr Ivan Senar of Crimson River Investments (Pty) Ltd, to prepare this report which will form part of the above proposal.

The proposed development comprises Business I. Initially the buildings will be used for offices and residential. For purposes of this study they have been treated as a single development in their entirety and will commonly be referred to hereafter as “the site”.

Following the investigation and study, recommendations regarding site access from the public road network, road network improvements, internal site layout, traffic safety, on-site circulation and parking, as well as requirements regarding any loading facilities, will be made.

Development contributions, in the form of a development levy, towards the road network improvements required as remedial measures for the anticipated impact the development trips would have on the available public road network will also be recommended.

The approach and methodology followed in conducting this study were in terms of References included in Chapter 11.

## 2. THE SITE

### 2.1 Status Quo

The site is located in Beacon Bay North, a relatively new suburb situated within East London. The proposed access to the site is onto Quenera Drive via St Helena Road. A site locality map can be seen in Figure 2.1.

The current use, coupled with the existing structures found on the site, generate very limited trips for the daily peak hours.

### 2.2 Proposed Development

The existing land use and the proposed subdivision and rezoning of the property in question include the proposed land uses as given in Table 2.1.

The proposed development comprises Business 1. Initially the buildings will be used for offices and residential. The proposed development is compliant with the spatial development framework of the area. The proposed site layout is illustrated in Figure 2.2.

Currently the site layouts for the various sites have not been finalised and therefore maximum GLA as indicated in Table 2.1 has been assumed. This has been calculated, using the "*Trip Calculator*", and is based on the maximum development potential which is related to the area of the site, areas required for parking bays and loading bays and the overall coverage of the site.

**TABLE 2.1: Existing and proposed land use components.**

Land use	Size		unit
	Existing	Proposed	
Agriculture	1.28	0	ha
Retail	0	5000	sqm GLA

### 3. EXISTING OPERATING CONDITIONS

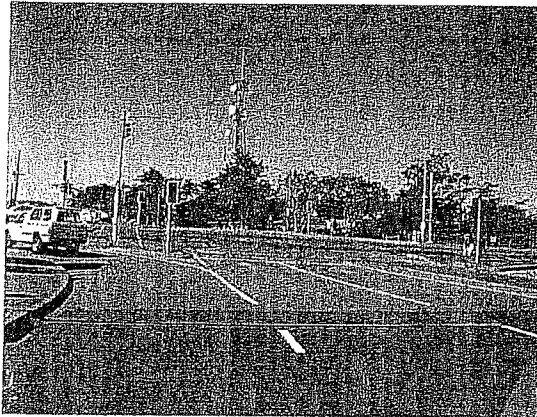
#### 3.1 Intersection Control

Control strategies at the existing intersections relevant to this study are presented in Table 3.1.

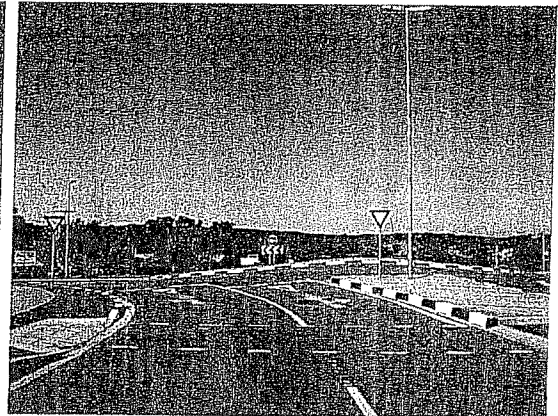
**TABLE 3.1: Control Strategies.**

No.	Intersection	Control
1	Quenera Drive/Bonza Bay Road	Traffic signals
2	Quenera Drive/St Helena Road	Roundabout
3	St Helena Road/Access point	Roundabout

The following are photographs of some of intersections that will be utilised by traffic generated by the development.



*Quenera Drive/Bonza Bay Road*



*Quenera Drive/St Helena Road*



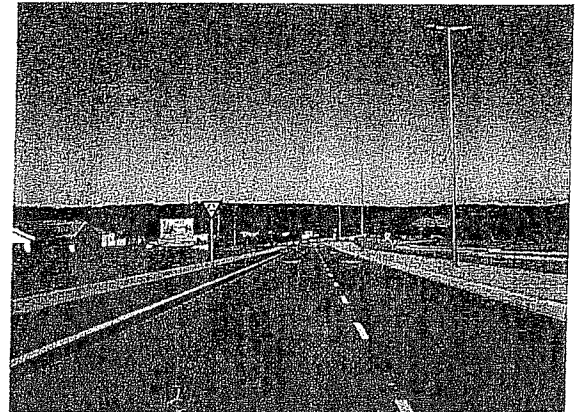
*St Helena Road/ Access Point*

### 3.2 Capacity along access roads

Quenera Drive is a road that of metropolitan significance and provides access to Bonza Bay Road in the south and will in future provide access to Gonubie in the north – this is once the construction of the remainder of Quenera Drive is completed.



*Quenera Drive: Southbound*



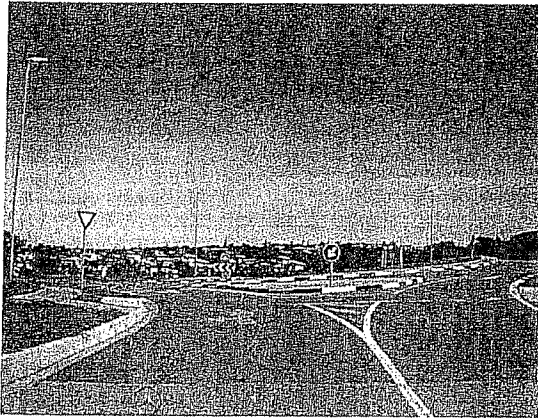
*Quenera Drive: Northbound*

From onsite observations sufficient spare capacity appears to exist along road network to cater for the medium to long term future regarding anticipated traffic growth, including future trips relating to this development. This will however be analysed and commented on later in this report.

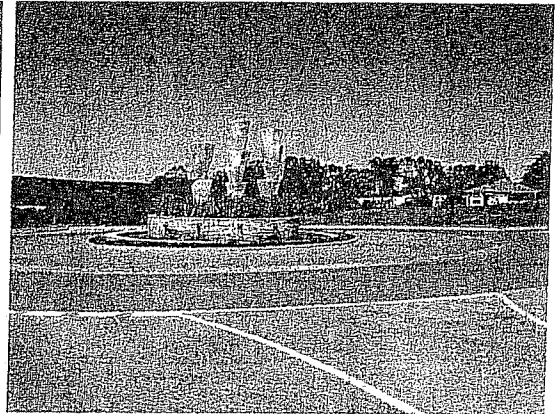
### 3.3 Traffic Calming

Traffic calming in the form of roundabouts, raised plateaus, mini-circles and pedestrian tables exist along the surrounding road network. As a result of the traffic calming the observed vehicular speeds in the vicinity of the traffic calming rarely exceed the posted speed limit.

The following are photographs of some of traffic calming measures as discussed above.



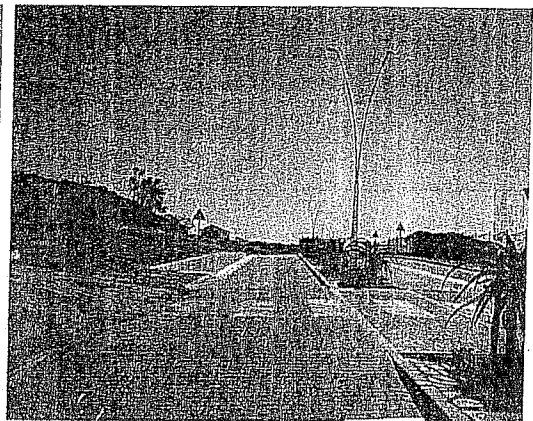
*Roundabout along Quenera Drive*



*St Helena Road/Access point Roundabout*



*Raised plateau and mini-circle along Triple Point  
Access Road*

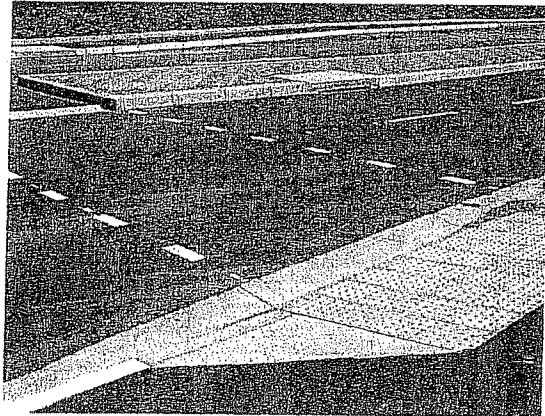


*Wide raised pedestrian table along Triple Point  
Access Road*



### 3.4 Pedestrian and cycle facilities

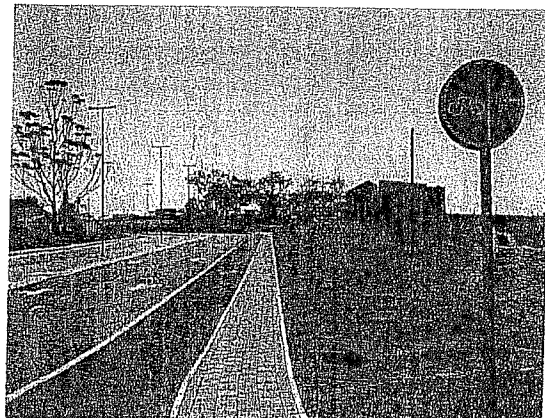
Formalised pedestrian and cycle facilities are currently available on the surrounding road network. These include the pedestrian crossings in the vicinity of the all the roundabouts along Quenera Drive, surfaced combined sidewalks and cycle lanes along Quenera Drive, and raised pedestrian tables along the Triple Point Access Road as illustrated below.



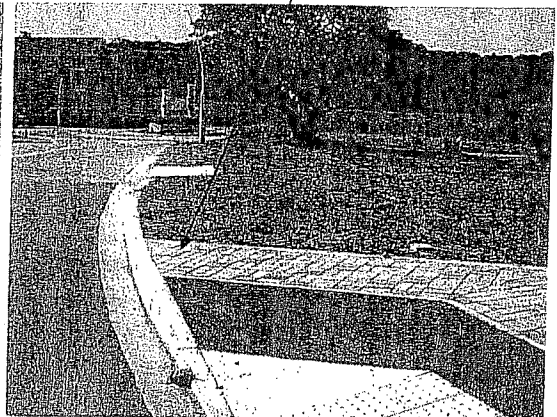
*Pedestrian crossing at a roundabout along Quenera Drive*



*Raised pedestrian table along the Triple Point Access Road*



*Combined pedestrian and cycle facility along Quenera Drive*

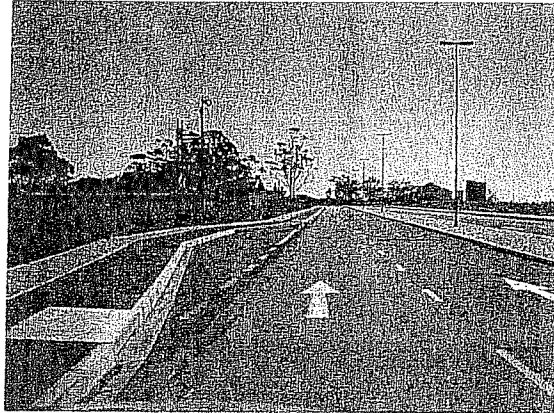


*End of combined pedestrian and cycle facility along St Helena Road*

No formalised pedestrian or cycle facilities are currently available along St Helena Road.

### 3.5 Public transport facilities

Formalised public transport facilities are currently available on the surrounding road network. These include the taxi/bus embayments in the vicinity of all the roundabouts along Quenera Drive, the closest being the facility at the Quenera Drive/St Helena Road intersection, located adjacent to the proposed development.



*Public Transport facility in the vicinity of the Quenera Drive/St Helena Road intersection*

The majority of Buffalo City's population depends on public transport to access jobs, schools, recreation, shopping and other opportunities that the City currently offers. A quality formal public transport system is recognized as the best means of managing an efficient city, through reducing congestion otherwise caused by the excessive use of the private car. Car use should be limited and regulated by travel demand management. Those owning private cars should use public transport as the mode of choice for regular commuting and other trips.

Of all motorised trips made in Buffalo City public transport accounts for 62% of trips compared with 38% by private car, and is therefore an important means of travel for the majority of citizens of Buffalo City. Surveys carried out in 2002 indicate that of 300 000 trips made using public transport each day, 250 000 are made by taxi, 25 000 by scheduled conventional bus and 25 000 are made by passenger rail.

As public transport is of such critical importance Buffalo City has now developed its long-term vision for the future public transport system to be in place by 2020. The map below shows how the public transport network will be in 2020.

#### 4. EXISTING TRAFFIC VOLUMES

In order to establish the current traffic conditions relevant traffic count information was used. This traffic count information is available in "pdf" format in the CD attached to the back of this report.

Table 4.1 below gives a summary of the traffic count information utilised in this study.

**TABLE 4.1 Traffic Count Data Used.**

No.	Station	Data Type	Date	PHF		
				AM	PM	SAT
1	Quenera Drive/Bonza Bay Road	PM peak Hr Manual classified traffic volume	21-Sep-05	NA	0.85	NA
2	Quenera Drive/Bonza Bay Road	6 Hr Manual classified traffic volume	24-Sep-05	NA	NA	0.93
3	Bonza Bay Road South of N2	12 Hr Manual classified traffic volume	11-Nov-06	NA	NA	NA

The analysis of current traffic performance is based on the observed traffic data that, when necessary, have been adjusted and smoothed in order to represent a balance network of traffic volumes for 2010. The balanced peak hour traffic flow volumes are displayed as network diagrams in Figures 5.1 to 5.5.

## 5.1 Traffic Generation

The recommended vehicle trip generation rates (as per Reference 1) for the land use categories listed in Table 2.1 were used to calculate the estimated number of trips for the various peak hours in order to determine the critical peak hour.

The recommended vehicle trip generation rates were then adjusted to take into account site specifics. The proposed development is intended to be a quality holistic live, work and play development that will focus on middle to upper income market. This concept, together with the following factors were considered when making the trip generation adjustments:

- i. availability of public transport,
- ii. employment opportunities,
- iii. predicted car ownership,
- iv. car pooling,
- v. land use mix, and
- vi. proximity to other relevant land uses.

Based on these factors trip reductions, as illustrated in Tables 5.1.1 and 5.1.2, were assumed.

Further, for business developments, the trip generation and assignment depend on whether the trips are primary, diverted, pass-by or transferred.

Primary trips, normally regarded as 42% of generated trips, are those where the visit to the development is the primary (and only) reason for the trip.

Diverted trips, normally regarded as 23% of the generated trips, are those where vehicles are diverted from roads in the vicinity of the development (but which are not adjacent to the development). On the roads adjacent to the development, such trips would be new trips. On the other roads, the diverted traffic will only result in a change in existing traffic patterns, but not an increase in traffic volumes. Traffic diverted to a development is usually treated as new or primary trips. This usually results in combined new trips of 65% of the total generated.

Pass-by trips, normally regarded as 35% of the generated trips, are those where the vehicles are diverted from roads adjacent to the development, and therefore do not constitute new or additional traffic on the road network. A portion of the traffic generated by a development can therefore be deemed to be pass-by traffic that will only result in a change in existing traffic patterns, but not in an increase in traffic volumes. This change in traffic pattern has been taken

into account in this study. The trip distribution for this pass-by traffic is based on current traffic volumes on the adjacent road and road network.

Transferred trips are trips that are already present on the road network and which are visiting similar developments near the proposed development and which have the potential of transferring or switching their destination to the proposed development. These trips are different from pass-by and diverted trips in that the trips are wholly transferred from one development to another.

Based on the current traffic volumes on the adjacent roads and road network pass-by and transferred trips equating to 35% has been assumed, thus resulting in 65% of the generated trips being regarded as new as illustrated in Tables 5.1.1 and 5.1.2.

The recommended in/out split for the peak hours can be seen in Tables 5.1.1 and 5.1.2 which also show details of trip generation calculations for the PM and SAT peak hours.

From Tables 5.1.1 and 5.1.2 it can be seen that the PM peak hour, in terms of trips generated, is less than the SAT peak hour for a regular week day. When the projected future traffic volumes and predicted traffic generated are added together, the combined effect changes the critical peak period from the SAT peak currently experienced to the PM peak hour.

**TABLE 5.1.1: Trip Generation (PM peak).**

Land use	Size	unit	Ref.1 trip rate	Veh. Trips as per DOT	Trip Rate, f	Split		Veh. Trips			New trips			
						in	out	Total	in	out	%	Total	in	out
Retail	5000	GLA	12	600	0.75	0.50	0.50	450	225	225	65	293	146	146
<b>TOTAL TRIPS</b>				600				450	225	225	NA	293	146	146
								<b>Tot. %</b>	50	50		<b>Tot. %</b>	50	50

**TABLE 5.1.2: Trip Generation (SAT peak).**

Land use	Size	unit	Ref.1 trip rate	Veh. Trips as per DOT	Trip Rate, f	Split		Veh. Trips			New trips			
						in	out	Total	in	out	%	Total	in	out
Retail	5000	GLA	19	950	0.75	0.50	0.50	713	356	356	65	463	232	232
<b>TOTAL TRIPS</b>				950				713	356	356	NA	463	232	232
								<b>Tot. %</b>	50	50		<b>Tot. %</b>	50	50

Note: Trip generation for office and retail not considered due to volumes being less than that of retail.

The following are the scenarios that were analysed:

- i. existing 2010 critical peak hour traffic,
- ii. existing 2010 critical peak hour traffic **with development** traffic,
- iii. projected 2015 critical peak hour **without development** traffic, and
- iv. projected 2015 critical peak hour **with development** traffic.

### 5.2 Trip Assignment/distribution

The generated trips, as identified in section 5.1, have been distributed to the road network manually, based on the principles of the gravity model and taking into account knowledge of local conditions, reference 5.

The trip distributed in the various peak periods are illustrated as percentages in Tables 5.2.1 and 5.2.2.

**Table 5.2.1: Trips Distribution (PM peak).**

Access Point	Direction	Perc.	Approaching/Exiting
Access point onto St Helena Road	In	50 %	Approaching along St Helena from the south.
		10 %	Approaching along St Helena from the west.
	Out	30 %	Exiting along St Helena towards the south.
		10 %	Exiting along St Helena toward the west.
Total		100%	

**Table 5.2.2: Trips Distribution (SAT peak).**

Access Point	Direction	Perc.	Approaching/Exiting
Access point onto St Helena Road	In	40 %	Approaching along St Helena from the south.
		10 %	Approaching along St Helena from the west.
	Out	40 %	Exiting along St Helena towards the south.
		10 %	Exiting along St Helena toward the west.
Total		100%	

The resultant trip assignments are illustrated as network diagrams in Figures 5.1 to 5.5 for the various scenarios and time horizons tested.

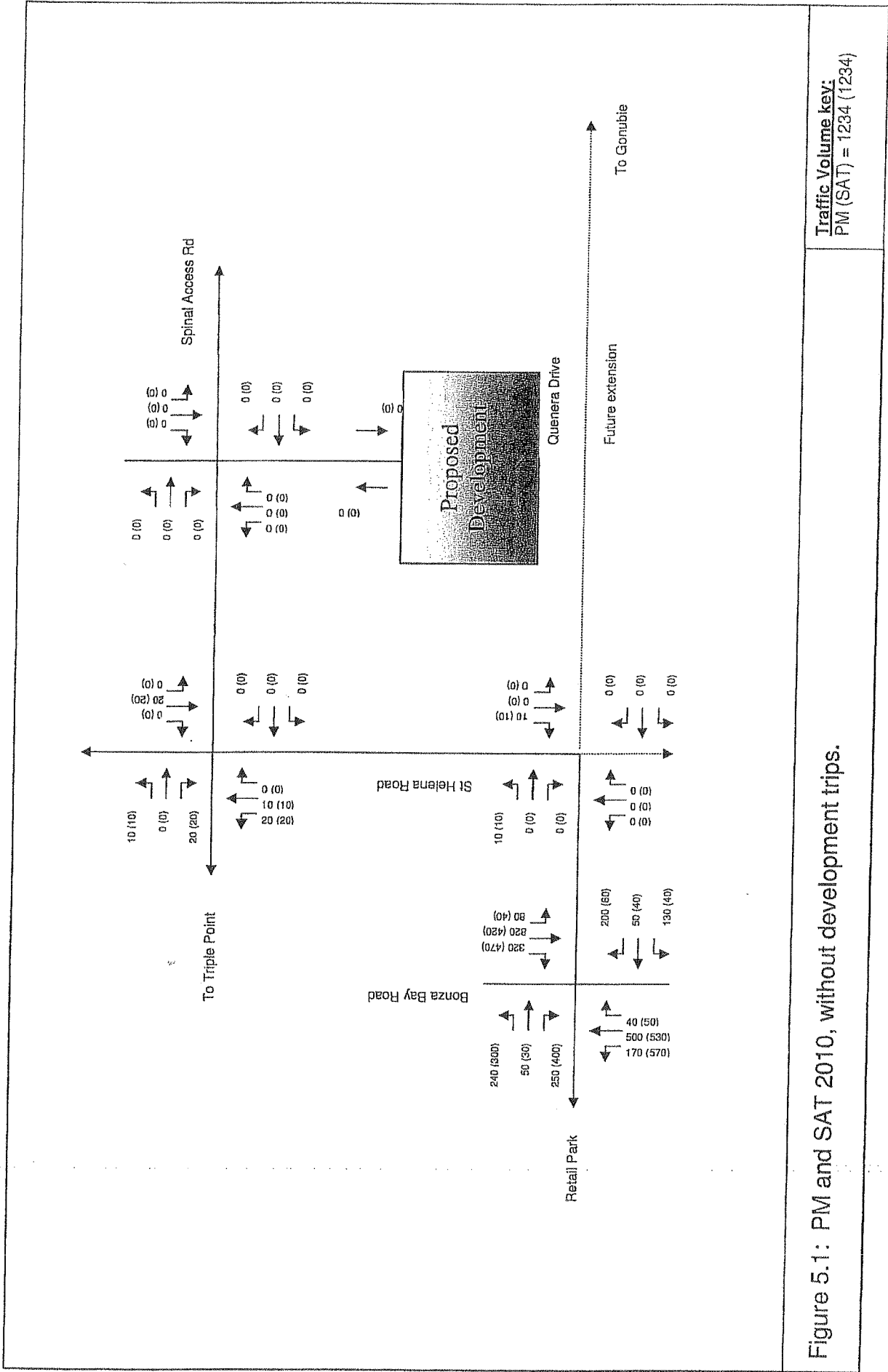
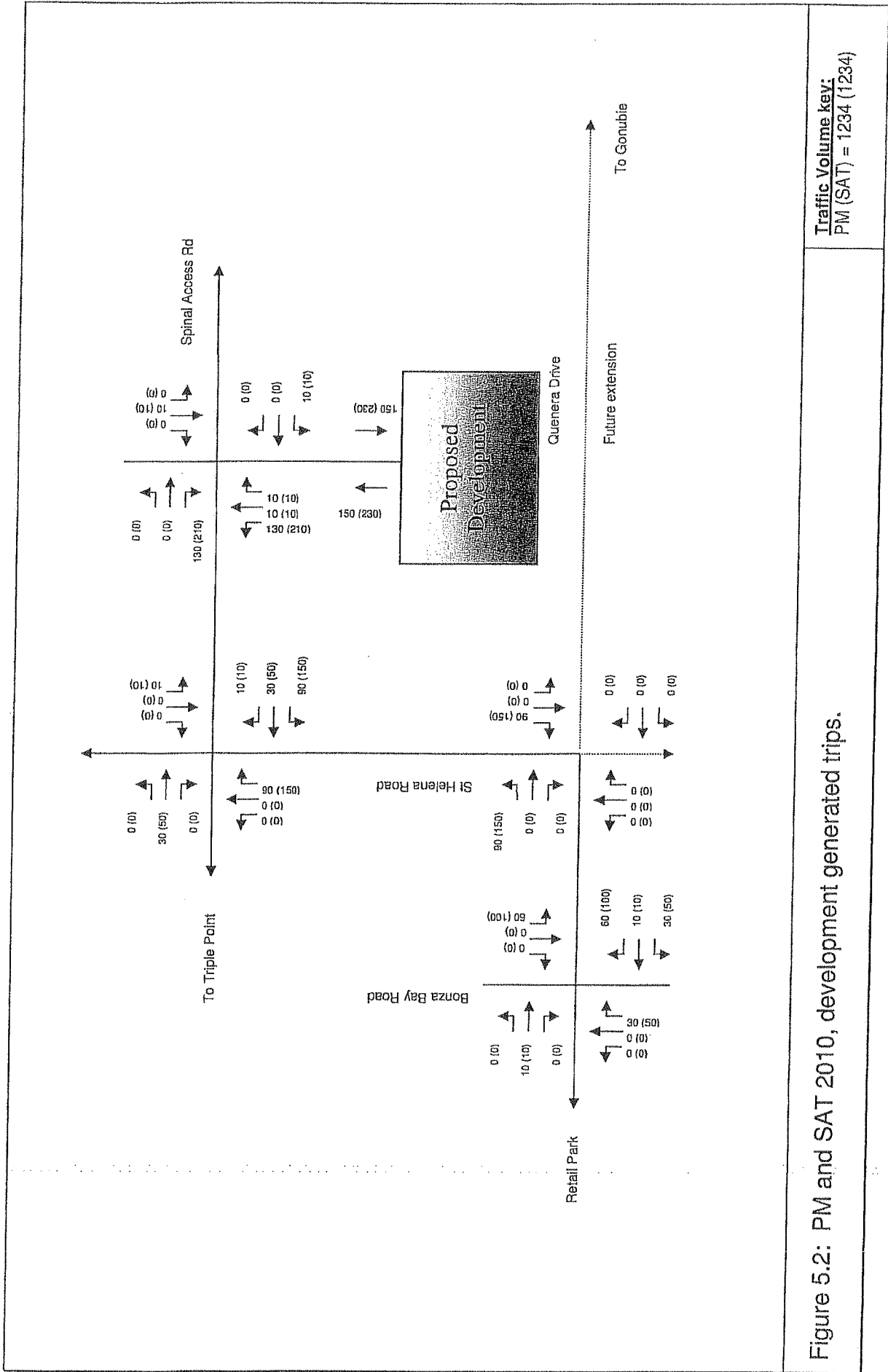
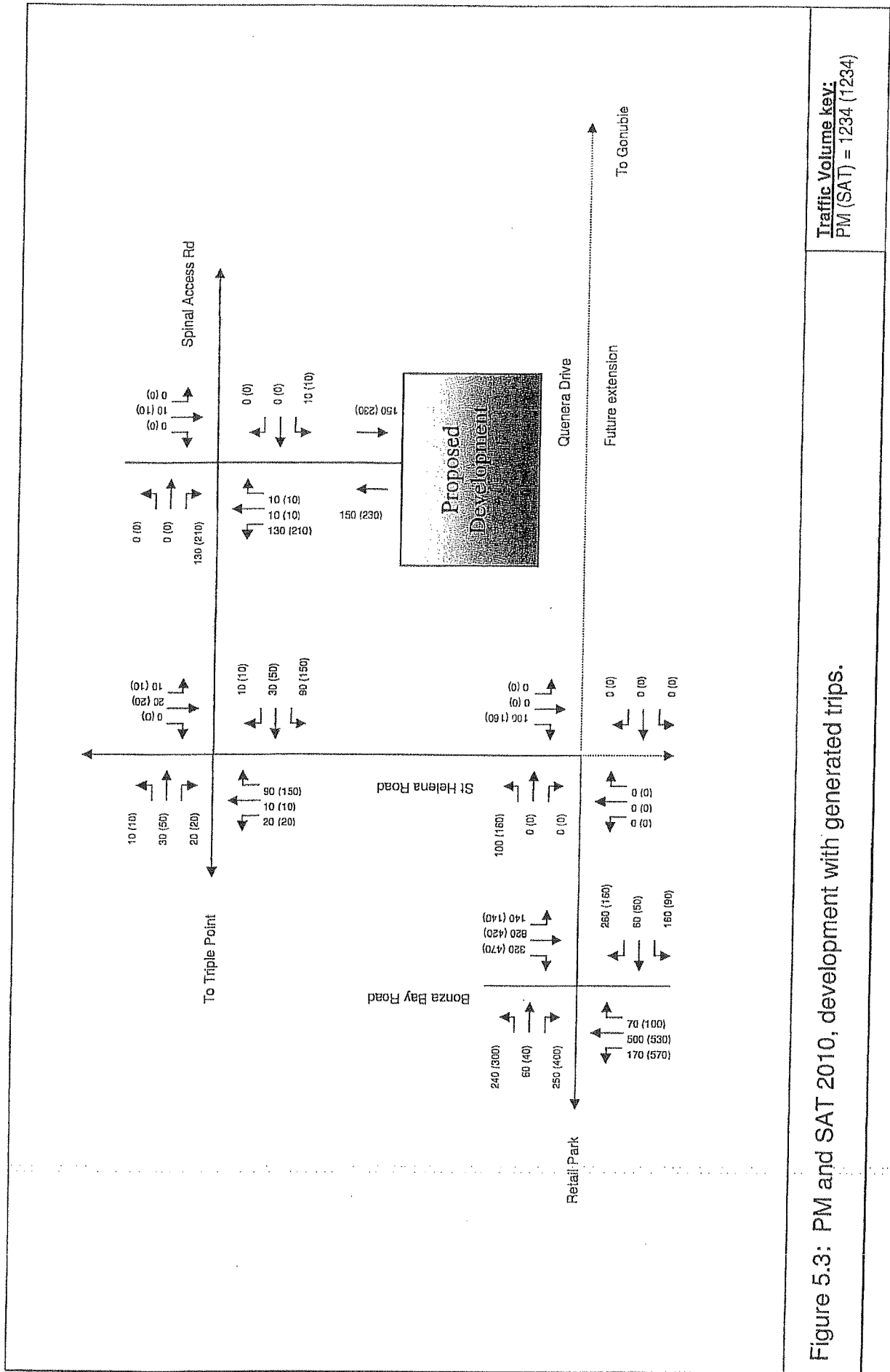


Figure 5.1: PM and SAT 2010, without development trips.

Traffic Volume key:  
PM (SAT) = 1234 (1234)







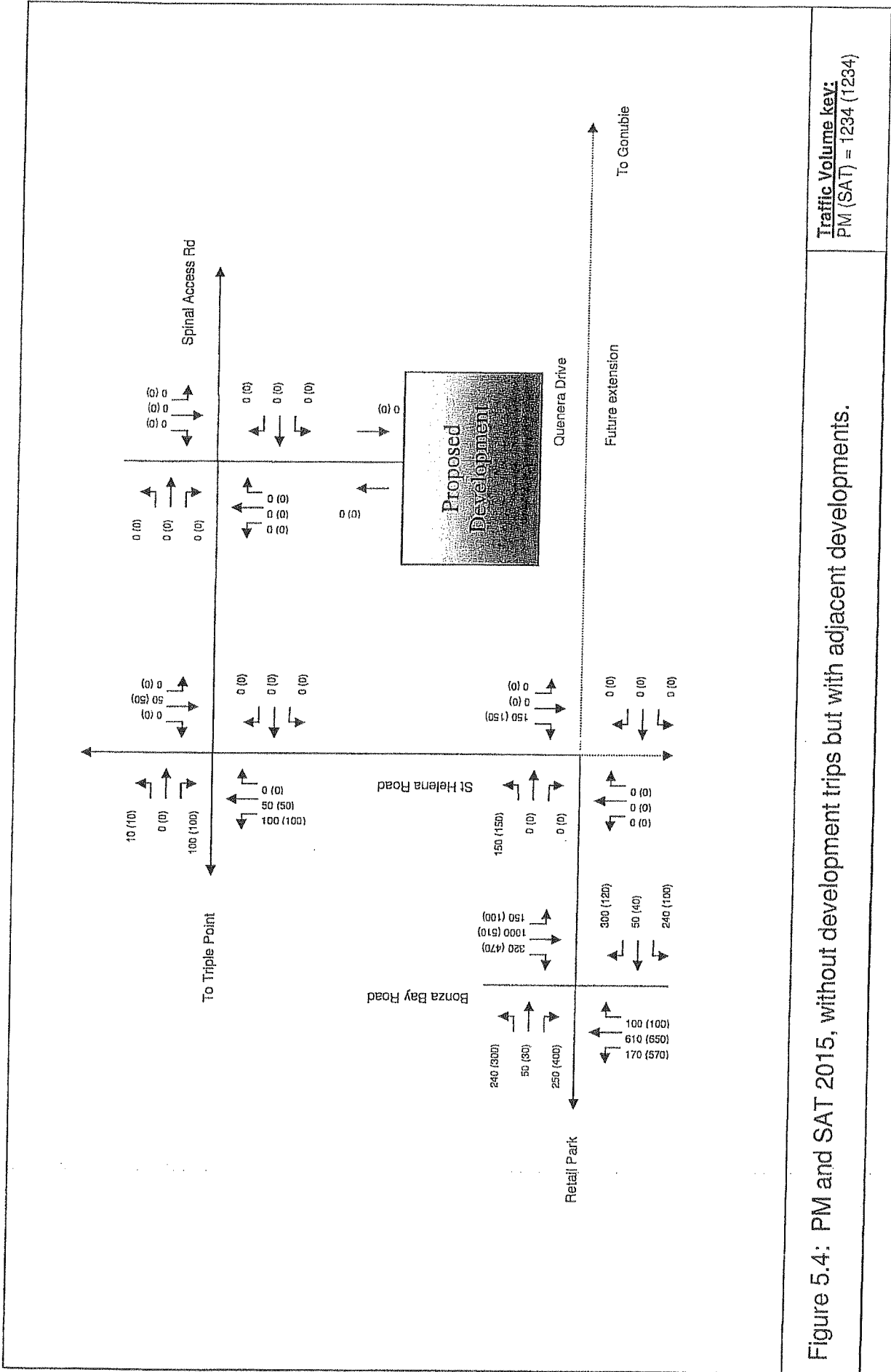
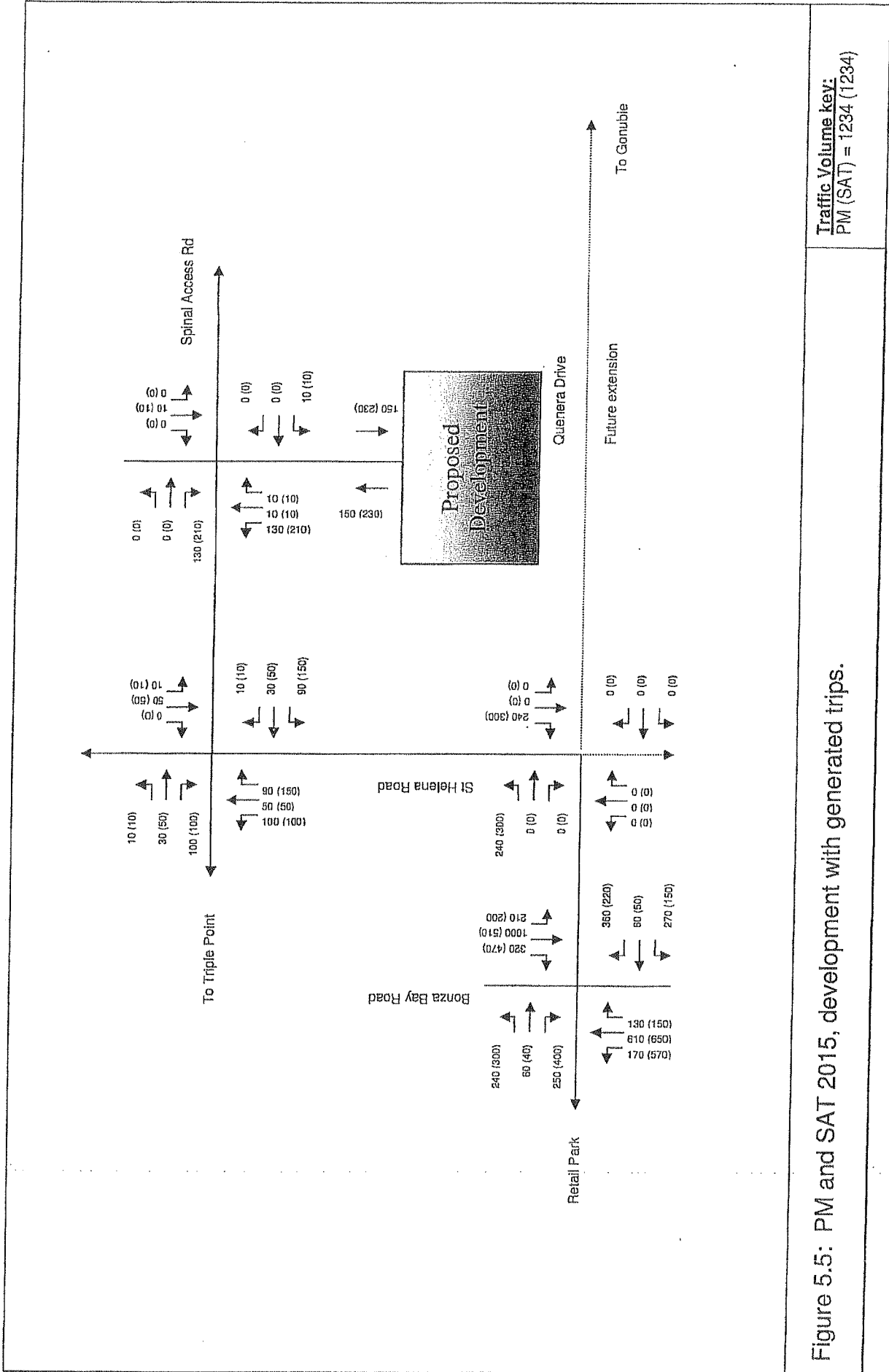


Figure 5.4: PM and SAT 2015, without development trips but with adjacent developments.

Traffic Volume Key:  
PM (SAT) = 1234 (1234)



## **6. INTERNAL CIRCULATION AND PARKING**

### **6.1 Internal circulation**

The internal circulating network proposed is shown in Figure 2.2 and the recommended layout in Figure 6.1. Some minor changes to improve the overall efficiency of the development, as listed below, have been included in Figure 6.1:

- i. disabled parking bays, and
- ii. pedestrian facilities.

It would be advisable for the developer to plan, design and build the internal layout to a standard acceptable by the Buffalo City Municipality in order to allow for accessibility of service and emergency vehicles, etc. The new proposed layout, as recommended in Figure 6.1, should meet these requirements and provides acceptable internal circulation.

### **6.2 Parking and loading facilities**

Refuse and other loading will occur at dedicated loading and refuse areas. Dedicated load bays are required for the retail components of the proposed development.

The Buffalo City Municipality guidelines for off street parking make allowance for parking reductions. The following are some of the factors that can be considered when applying for a parking reduction:

- i. public transport,
- ii. bicycle utilisation,
- iii. mixed land use,
- iv. predicted car ownership,
- v. location of development, and
- vi. expected tenants/occupants of the development.

In terms of the Buffalo City Parking Standards and Zoning Scheme, the required minimum parking and loading bays are as set out in Table 6.1, which also includes recommended reductions that may be granted.

**TABLE 6.1: Parking and loading requirements.**

Land use	Size	unit	Parking per unit/ GLA	Parking Required in terms of Guidelines (without reductions)	Parking Bay reduction for							Total recommended	Loading Bays									
					Public Transp.	Walking	Taxi embayments	Bus embayments	Bicycle	Total	Max permitted reduction		Light	Med.	Heavy							
																% or No.						
																0%	0%	0	0	2		40%
<b>Initial usage/GLA</b>																						
Office	920	GLA	6	55	0	0								0	0	0						
Residential	5	unit	2	10	0	0								0	0	0						
<b>Final usage/GLA</b>																						
Retail	5000	GLA	6	300	0	0	0	0	0	12				2	5	0						
<b>TOTAL REQUIRED for initial usage/GLA</b>				65	75	3	0	0	0	0	0	78		0	0	0						
<b>TOTAL REQUIRED for final usage/GLA</b>				300	280	8	0	0	0	12	0	300		2	5	0						
				Standard on-site parking										Light								
				Disabled parking										Med.								
				Bus embayments										Heavy								
				Taxi embayments																		
				Bicycle																		
				On-street parking																		
				Total																		

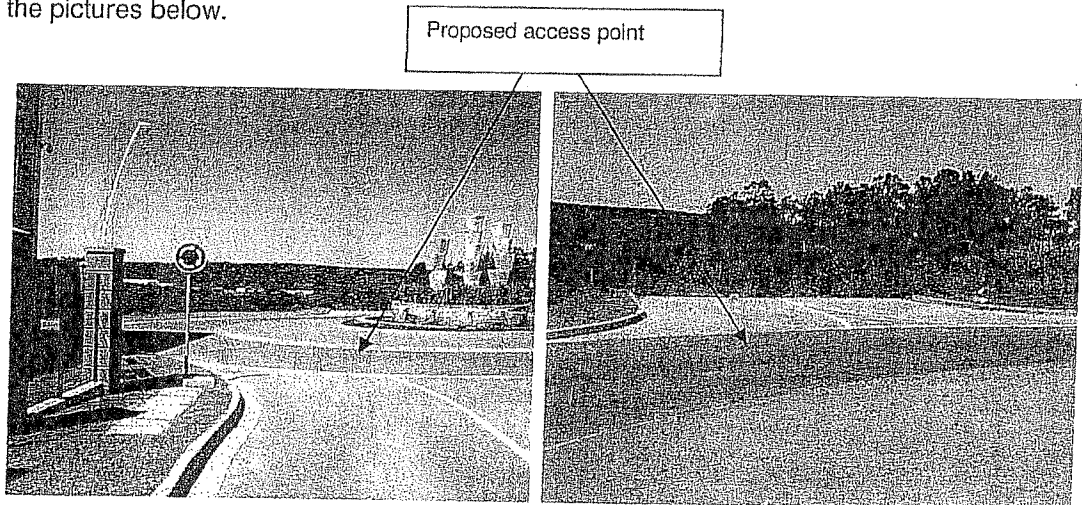
Based on the above the developer should approach the Buffalo City Municipality to reduce the required number of parking bays as indicated in Table 6.1 by providing two bicycle bays in lieu of standard parking bays based on the final usage/GLA of the development. No reductions should be requested for the initial usage/GLA of the development as it is currently oversupplied.

All the above parking requirements must be provided on the respective sites. It is however noted that an existing servitude will be utilised for manoeuvres into certain parking bays.

## 7. ACCESS PROPOSALS

### 7.1 Vehicular access

The proposed access to the site is onto Quenera Drive via St Helena Road and is shown in the pictures below.



*Proposed access onto St Helena Road*

*Proposed access onto St Helena Road*

The stopping sight distances associated with the specific posted speed limit of 60 km/h and the site gradients experienced is approximately 80m. All approaches at the proposed access point meet this minimum requirement.

The intersection sight distance for turning manoeuvres associated with the specific posted speed limit of 60 km/h is approximately 150m. This however needs not to be analysed as the proposed access is via an existing roundabout.

## **7.2 Pedestrian and bicycle access**

Pedestrian and bicycle access to the site is proposed via the proposed access points.

Due to the location and nature of the development it is expected to generate local pedestrian traffic and the appropriate pedestrian facilities have been recommended as illustrated in Figure 8.1 and listed below:

- i. surfaced pedestrian sidewalk along St Helena Road between Quenera Road and the proposed access point,
- ii. surfaced pedestrian sidewalk along the proposed developments main "spinal" access road, between St Helena Road and the servitude right of way access point, and
- iii. surfaced pedestrian sidewalk along the servitude right of way.

## **7.3 Access control**

Due to the nature and location of the development, no access control is proposed.

Tables 8.3.1 to 8.3.2 contain a summary of some of the SIDRA analysis results as undertaken at the various intersections.

Table 8.3.3 shows the control types assumed for the analysis for the various scenarios.

From the results it is clear that while the two peak periods test very similar, the current critical peak hour is the SAT peak hour. On completion of the development the SAT peak hour remains the more critical in terms of volume and LOS at intersections.

**TABLE 8.3.1: Intersection Level of Service (PM peak).**

KEY: A, C, E, NA

No.	Intersections	Level of Service									
		2010 PM		2010 PM <sub>develop.</sub>		2010 PM <sub>improved</sub>		2015 PM <sub>develop.</sub>		2015 PM <sub>improved</sub>	
		MOV.	INTERS.	MOV.	INTERS.	MOV.	INTERS.	MOV.	INTERS.	MOV.	INTERS.
1	Quenera Drive/Bonza Bay Road		C	E	C	NA	NA	E			C
2	Quenera Drive/St Helena Road	NA	NA	NA	NA	NA	NA	B	NA	NA	NA
3	St Helena Road/access point	NA	NA	B	NA	NA	NA	B	NA	NA	NA
4	Spinal access road/access to development	NA	NA	NA	NA	NA	NA	B	B	B	NA

**TABLE 8.3.2: Intersection Level of Service (SAT peak).**

KEY: A, C, E, NA

No.	Intersections	Level of Service									
		2010 SAT		2010 SAT <sub>develop.</sub>		2010 SAT <sub>improved</sub>		2015 SAT <sub>develop.</sub>		2015 SAT <sub>improved</sub>	
		MOV.	INTERS.	MOV.	INTERS.	MOV.	INTERS.	MOV.	INTERS.	MOV.	INTERS.
1	Quenera Drive/Bonza Bay Road		C		C	NA	NA			C	B
2	Quenera Drive/St Helena Road	NA	NA	NA	NA	NA	NA	B	NA	NA	NA
3	St Helena Road/access point	NA	NA	B	NA	NA	NA	B	NA	NA	NA
4	Spinal access road/access to development	NA	NA	NA	NA	NA	NA	B	B	B	NA

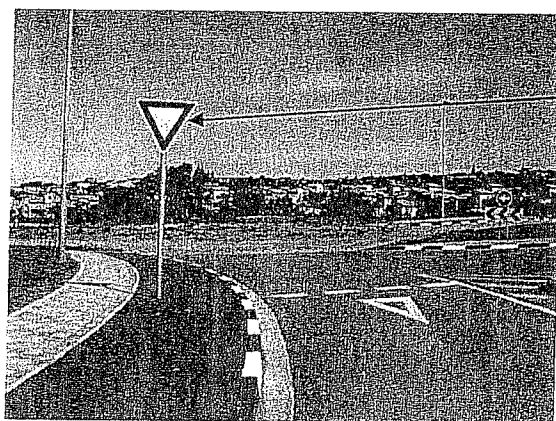
**TABLE 8.3.3: Intersection Control Type.**

No.	Intersections	Intersection control type			
		2010	2010 <sub>improved</sub>	2015 <sub>development</sub>	2015 <sub>improved</sub>
1	Quenera Drive/Bonza Bay Road	Traffic signals	Traffic signals	Traffic signals	Roundabout
2	Quenera Drive/St Helena Road	Roundabout	Roundabout	Roundabout	Roundabout
3	St Helena Road/access point	Roundabout	Roundabout	Roundabout	Roundabout
4	Spinal access road/access to development	Priority/Stop	Mini-circle	Priority/Stop	Mini-circle



### Incorrect road signs at all Quenera Drive roundabouts

The two existing roundabouts along Quenera Drive have yield signs (R2) instead of roundabout signs (R137) placed at the entry to the roundabouts. This is incorrect and it is recommended that the R2 signs be removed and replaced with R137 signs.



Incorrect road sign for roundabout

*Example of incorrect signage- Quenera Drive/St Helena Road*

### Quenera Drive/Bonza Bay Road intersection

This intersection currently operates as a traffic signal controlled intersection. With the increase in traffic expected the best operational LOS is achieved by adjusting the traffic signal timings to take into account the new traffic patterns at the intersection.

However, in 2015 the increase in traffic from the development and the general traffic growth, an alternative form of control is recommended. With the relatively high percentage of right turners the most appropriate form of control for this intersection is a roundabout. It is therefore recommended that this intersection be converted to a two lane roundabout (large circle) with slip lanes by 2015.

### St Helena Road/Spinal Access Road intersection

Based on traffic volumes this intersection does not require any upgrading.

### **Public Transport facilities**

Currently a public transport facility has been provided on the westbound exit to the Quenera Drive/St Helena Road intersection. This facility will be sufficient to cater for the proposed development until such time as Quenera Drive is extended to the east. Once the extension of Quenera Drive occurs, an eastbound public transport facility at the same intersection is to be constructed as per the already approved designs for the extension of Quenera Drive.

### **Pedestrian facilities**

Due to the location and nature of the development it is expected to generate local pedestrian traffic, particularly along St Helena Road, the Spinal Access Road and the servitude right of way. Due to the expected pedestrian volumes the appropriate pedestrian facilities have been recommended as illustrated in Figures 6.1 and 8.1.

### **Quenera Drive access restrictions**

It is essential to ensure that no direct vehicular or pedestrian access be permitted on Quenera Drive. The only access on Quenera Drive is to be via the existing Quenera Drive/St Helena Road roundabout.

Currently a right-of-way servitude exists that affords erven 3948 and 5712 access on Quenera Drive in close proximity to the Quenera Drive/St Helena Road roundabout. Due to following reasons it is essential that this servitude be closed:

1. Servitude is too close to the existing Quenera Drive/St Helena Road roundabout.
2. The class of road of Quenera Drive requires limited access.
3. Alternative safer access is recommended as described in the section below (access to erven 3948 and 5712).

### **Access to erven 3948 and 5712**

As mentioned above, a servitude right of way currently provides access to erven 3948 and 5712 on Quenera Drive in close proximity to the Quenera Drive/St Helena Road roundabout.

However, an alternative access arrangement is recommended as indicated in Figure 2.2. A servitude right of way, in favour of both of these erven, placed over Portion 20 of the adjacent development and portion 53 of farm 817. This access arrangement is the most desirable from a traffic flow and safety point of view and should be pursued by the owners of erven 3958 and 5712 and the developer of Portion 53 of Farm 817.

This access arrangement should only be enforced once portion 53 of Farm 817 has been developed. In the interim it is recommended that temporary access be permitted off Quenera Drive. The temporary access off Quenera Drive should be as follows:

1. full access if Quenera Drive is not constructed to the roundabout east of the development,
2. partial access, left-in, left-out, if Quenera Drive is constructed to the roundabout east of the development.

#### **Quenera Drive building line**

Due to Quenera Drive being a road of metropolitan significance, a 5m building line will most likely be imposed on the sites abutting the road.

#### **Guestimated Costs**

The guestimated costs for the improvements discussed above are illustrated in Table 8.4. It should be noted that more detailed estimated costs will be determined by the appointed design engineers through the standard design process.

**TABLE 8.4: Guestimated costs.**

Description of Improvement	Location	Guestimate R
Construct four th leg of roundabout	Quenera Drive/St Helena Road	R 200,000
Change R2 to R137 signs	Two roundabouts along Quenera Drive	R 5,000
Pedestrian facilities	Along St Helena Road and Spinal Access Road	R 200,000
Timing adjustment	Bonza Bay Road/Quenera Drive	R 0
Roundabout	Bonza Bay Road/Quenera Drive	R 1,000,000
Totals		R 1,405,000

## 9. CONCLUSIONS

Following the investigation and analysis it is concluded that:

- i. The current operating conditions found on the road network within the study area are found to be acceptable with no LOS or capacity failures.
- ii. The posted speed limit of 60 km/h along St Helena Road and Quenera Drive, in the vicinity of the site access, is appropriate for the current and expected future traffic conditions.
- iii. The existing critical peak, in terms of traffic volume, was found to be the SAT peak hour while the PM peak hour tested very similar but with marginally lower demands.
- iv. Once developed and fully occupied, the proposed development may be expected to generate in the order of 293 and 463 vehicle trips in PM and SAT commuter peak hours.
- v. The combined critical peak hour of existing and development trips is found to be the PM peak hour.
- vi. The network is not overloaded when development trips are assigned for any of the given tested peak hours, subject to the recommended road network improvements being undertaken.
- vii. The proposed changes to the proposed layout and road network, as shown in Figures 6.1 and 8.1 respectively, the site layout and road network adequately serve the proposed development.
- viii. Development levies, as described in Appendix C, are applicable to the road infrastructure required by this development.

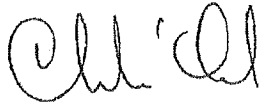
## 9. RECOMMENDATIONS

Based on the investigation and conclusions it is recommended that:

- i. This Traffic Impact Study being submitted to the Buffalo City Municipality for their perusal with the complete development proposal.
- ii. The development proposal, that is the rezoning of erven 3948 and 5712, East London to Business I, as submitted and reflected herein, being approved in principle by the Buffalo City Municipality from a traffic impact perspective.
- iii. The site layout changes, as shown in Figure 6.1, being made a condition of approval. The required internal road network improvements to be made by the development are as follows:
  - a. disabled parking bays,
  - b. pedestrian facilities.
- iv. The road network improvements, as listed below and shown in Figures 6.1 and 8.1, being made a condition of approval. It should however be noted that these improvements may change subject to subsequent investigations in consultation with the Buffalo City Municipality. The required public road network improvements to be made to accommodate the development are as follows:
  - a. The construction of the fourth leg of the Quenera Drive/St Helena Road roundabout. It should be noted that it is essential that the fourth leg of the roundabout be installed prior to this development becoming operational.
  - b. The changing of all the yield signs (R2) to roundabout signs (R137) at the two existing roundabouts along Quenera Drive.
  - c. The adjustment of the traffic signal timings by 2010 and the construction of a roundabout by 2015 at the Quenera Drive/Bonza Bay Road intersection. It should be noted that the roundabout is not required due to the development and is only further required by 2015.
  - d. A public transport facility being constructed on the eastbound exit side of the Quenera Drive/St Helena Road intersection at the same time as Quenera Drive is extended to the east.
  - e. Pedestrian sidewalks, which tie into the existing pedestrian/cycle facilities at the Quenera Drive/St Helena Road intersection, being constructed along St Helena Road until the access point to the Spinal Access Road.
  - f. Pedestrian sidewalks being constructed along the Spinal Access Road, west of the proposed servitude right of way.

- g. Access to erven 3948 and 5712 being provided via a servitude right of way that traverses Portion 20 of Portion 53 of Farm 817. It is further recommended that the owners of erven 3948 and 5712, and the developer of Portion 53 of Farm 817 liaise with one another in this regard
  - h. Temporary access being permitted onto Quenera Drive via the current servitude right of way until such time as Portion 53 of Farm 817 is developed to an extent that permits access via St Helena Road and the Spinal Access Road.
  - i. The current servitude right of way being closed at its intersection with Quenera Drive so as to limit the number of accesses onto this road of metropolitan significance.
  - j. No direct vehicular and/or pedestrian access being permitted on Quenera Drive.
  - k. A 5m building line being imposed on the sites abutting Quenera Drive.
  - l. The section of roadway required for the extension of Quenera Drive being registered as roadway.
- v. The developer requests the Buffalo City Municipality to consider granting a parking bay reduction as per details as described in section 6.2.
  - vi. All costs associated with the internal roads, as indicated in Figures 6.1, being solely to the developer's account.
  - vii. Due to the development and its associated generated traffic falling within the Beacon Bay LSDF area, the developer is required to contribute a development levy based on the trips generated. With a new expected 463 trips being generated, the developer is to contribute an amount of R 972,300 plus escalation that is to be calculated at the CPI from 1 January 2009 to date the Site Development Plan is approved.
  - viii. This development levy being utilised for the following:
    - a. The construction of a fourth leg of the roundabout at the Quenera Drive/St Helena Road intersection as listed in "iv", item "a".
    - b. The construction of the pedestrian facilities along St Helena Road and the Spinal Access Road as listed in "iv", items "e" and "f"
    - c. The construction of the public transport facilities on the eastbound exit to the Quenera Drive/St Helena Road intersection as listed in "iv", item "d".
    - d. The closing off of the servitude right-of-way access onto Quenera Drive as listed in "iv", item "i".
    - e. The construction of a roundabout at the Quenera Drive/Bonza Bay Road as listed in "iv", item "c".

- ix. All costs associated with the recommendations as listed in "iv", items "b" and "l" above being solely to the Buffalo City Municipality's account.
- x. All costs associated with the recommendations as listed in "iv", items "g", "h", "i" "j" and "k", being solely to the developer's account.



D M McQUIRK Pr. Eng.

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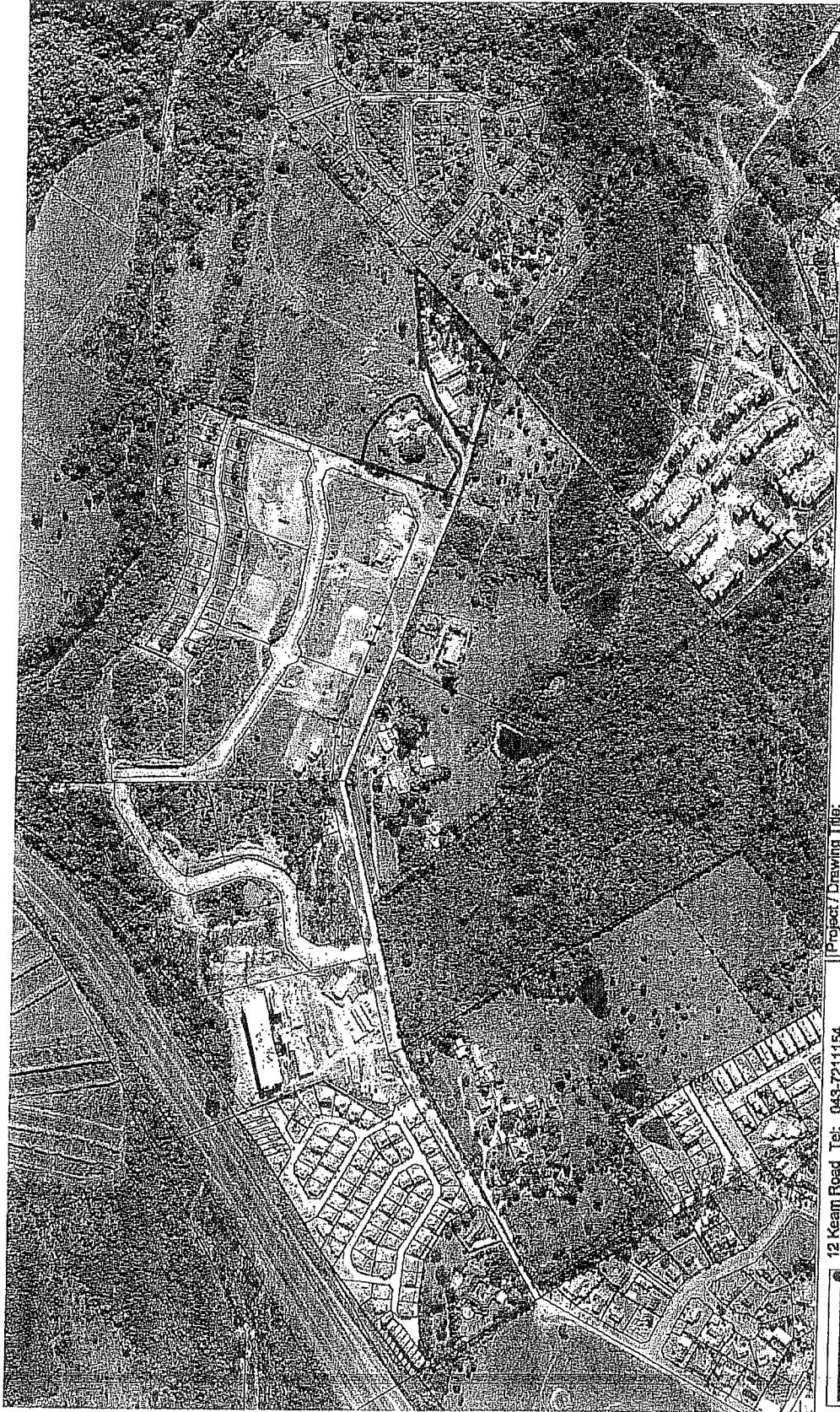
## 11. REFERENCES

- Ref. 1 South African Trip Generation Rates. 2<sup>nd</sup> Edition, June 1995.
- Ref. 2 Manual for Traffic Impact Studies RR93/635, October 1995.
- Ref. 3 Buffalo City Traffic Impact Study Checklist.
- Ref. 4 SIDRA operators manual.
- Ref. 5 Draft National Policy for Traffic Impact Assessments and Site Traffic Assessments in South Africa, January 2009.

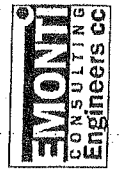


**APPENDIX A**

**FIGURES**



12 Keam Road  
Rayssville  
East London  
5241



Tel: 043-7211154  
Cell: 0834651556  
e-mail: deonmoquirk@telkomsa.net

Project / Drawing Title:

Traffic Impact Study for  
erven 3948 and 5712, East London  
SITE LOCALITY PLAN

Scale:

1:5000

Drawn By:

P. Farant

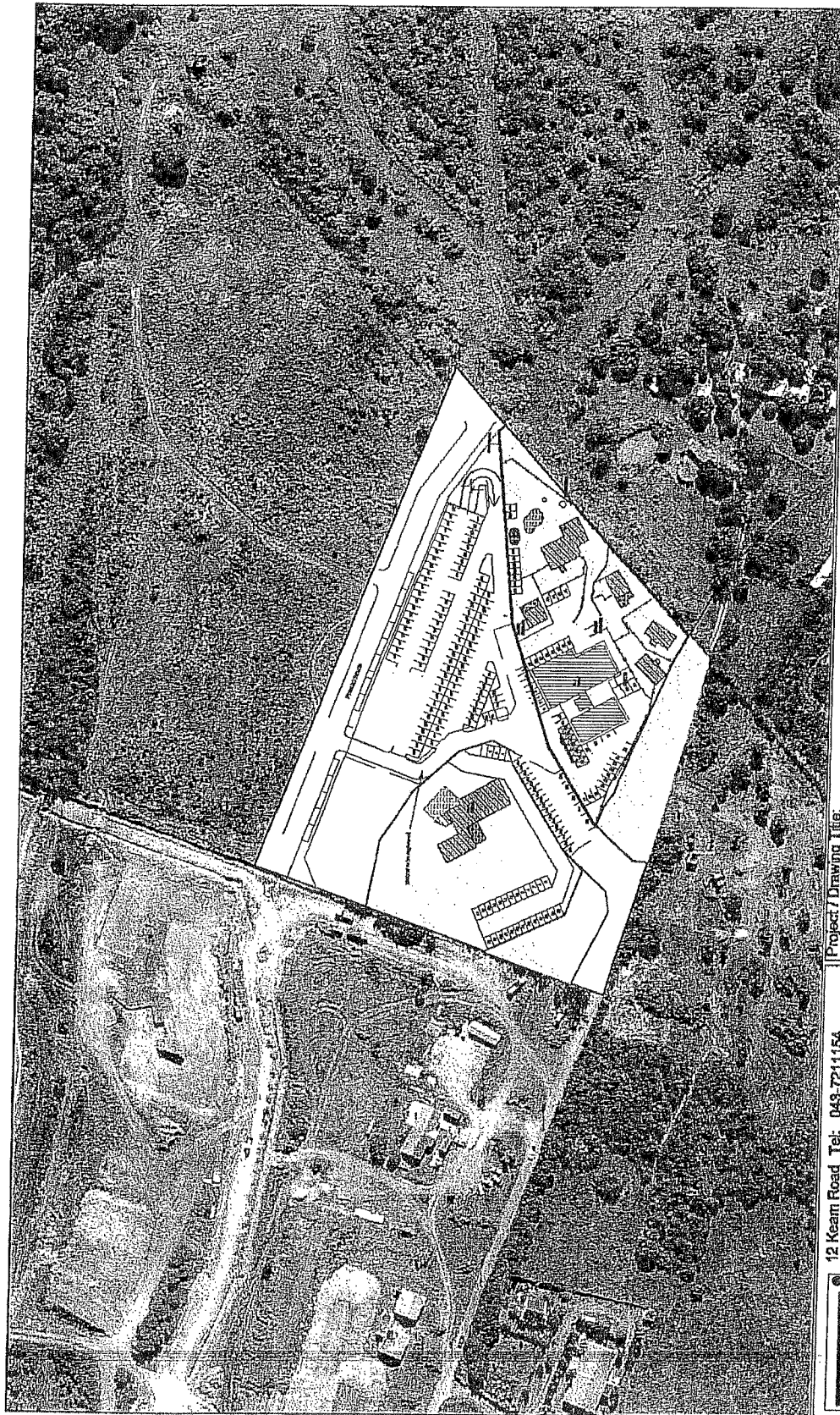
Drawing No:

Figure 2.1

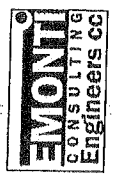
CONCEPT DRAWING

Project No:

Erven 3948 & 5712 East London



12 Keam Road  
 Baysville  
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Project / Drawing Title:

Traffic Impact Study for  
 erven 3948 and 5712, East London  
 PROPOSED LAYOUT

Scale:  
 1:2000

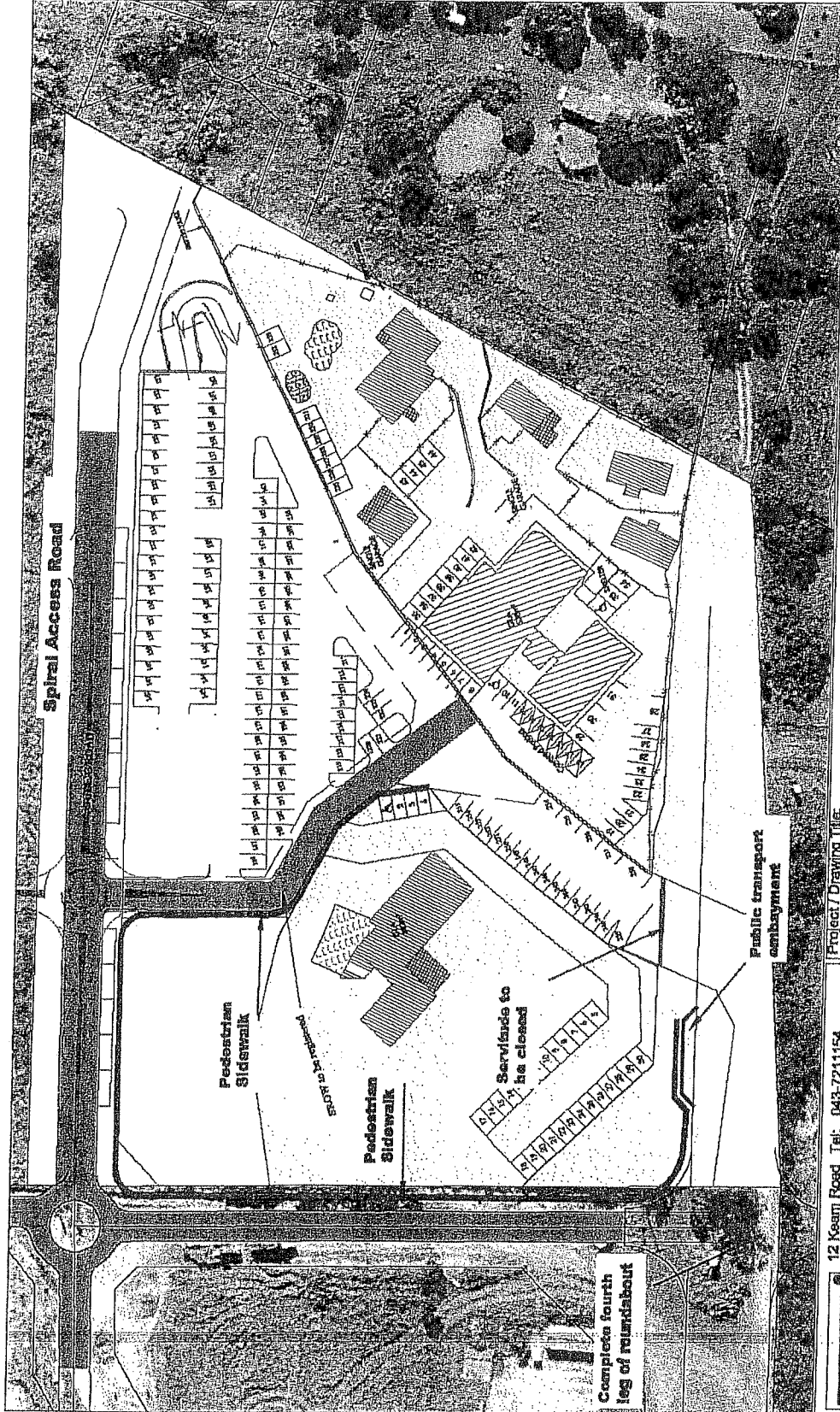
Drawn By:  
 P Farrant

CONCEPT DRAWING

Project No:  
 Erven 3948 & 5712 East London

Drawing No:

Figure 2.2



Scale:	1:1000	CONCEPT DRAWING
Drawn By:	P Farrant	Project No:
		Erven 3948 & 5712 East London
Drawing No:	Figure 6.1	

Project / Drawing Title:

**Traffic Impact Study for  
erven 3948 and 5712, East London  
RECOMMENDED LAYOUT**

12 Keam Road  
Bayville  
East London  
5241

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**EMONTI**  
CONSULTING  
Engineers CC

Complete fourth  
leg of roundabout

**APPENDIX B**

**SIDRA INTERSECTION LOS RESULTS**

FIGURE B.1.A: Level of Service (LOS).

Intersection: **Bonza Bay Road/Quenera Drive**

Without improvements

Design year	Peak	Design year	
		2010	2015
	<p>PM (without development trips)</p>		
		<p>SAT (with development trips)</p>	
<p>PM (with development trips)</p>	<p>SAT (without development trips)</p>		

FIGURE B.1.B: Level of Service (LOS).

Intersection: Bonza Bay Road/Quenera Drive		Design year	
With improvements		2010	2015
	Peak		
	PM (with development trips)	NA	NA
	SAT (without development trips)	NA	NA
	PM (without development trips)	NA	NA
	Peak	2010	2015
		SAT (with development trips)	NA
	PM (with development trips)	2010	2015
		PM (with development trips)	NA

FIGURE B.2.A: Level of Service (LOS).

Intersection:	Design year		Peak
	2010	2015	
Without improvements			PM (without development trips) NA
			SAT (without development trips) NA
With improvements			PM (with development trips) NA
			PM (with development trips) NA



FIGURE B.3.A: Level of Service (LOS).

Intersection:	Design year		
	2010	2015	
St Helena Road/Spinal Access Road	Peak	PM (without development trips)	NA
	Peak	SAT (without development trips)	NA
Without improvements	Design year		
	2010	2015	
Without improvements	Peak	PM (with development trips)	
		SAT (with development trips)	
With improvements	Peak	PM (with development trips)	
		SAT (with development trips)	
With improvements	Peak	PM (without development trips)	NA
		SAT (without development trips)	NA
With improvements	Design year		
	2010	2015	
With improvements	Peak	PM (with development trips)	
		SAT (with development trips)	

FIGURE B.4.A: Level of Service (LOS).

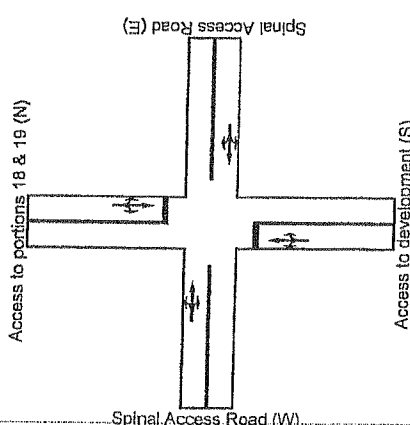
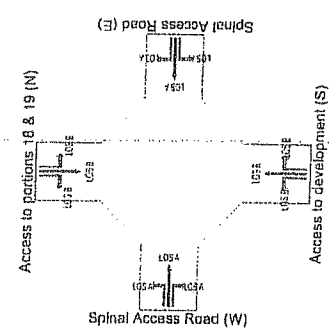
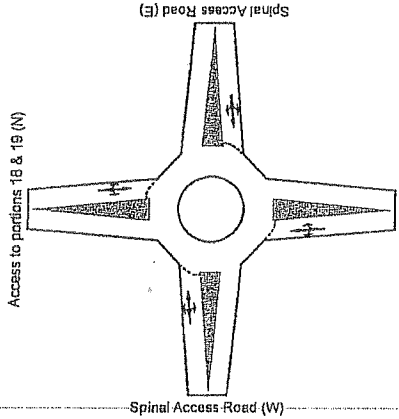
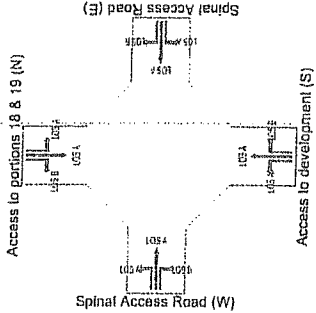
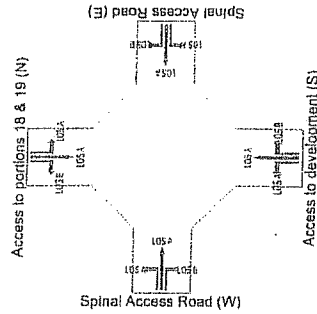
Intersection:	Spinal Access Road/access to development		Peak	Design year	
	Without improvements	Spinal Access Road/access to development		2010	2015
Without improvements		NA	PM (without development trips)	NA	NA
		SAT (with development trips)	PM (with development trips)	NA	NA
With improvements		NA	PM (with development trips)	NA	NA
		SAT (with development trips)	PM (with development trips)	NA	NA

FIGURE B.4.B: Level of Service (LOS).

Intersection:	Spinal Access Road/access to development		Design year	
	With improvements	Peak	2010	2015
	PM (without development trips)	NA	NA	NA
	SAT (without development trips)	NA	NA	NA
	PM (with development trips)	NA	NA	
	SAT (with development trips)	NA	NA	NA

**APPENDIX C**  
**DEVELOPMENT LEVIES**

## DEVELOPMENT LEVIES

### **C.1. Background**

Local authorities all over the world and in the rest of South Africa have the same challenges in terms of providing road capacity and other essential services. The cost of road infrastructure is high and the shortfall in funds collected from regular rates and service levies need to be supplemented in alternative ways in order to provide sufficient capacity of service networks, particularly relating to new developments.

### **C.2. Existing Development Levies**

The Buffalo City Municipality (BCM) identified the need to introduce development levies for road improvements required as a result of increased traffic volume due to developments. These development levies relate to specific Local Spatial Development Frameworks (LSDF) and to the road improvements identified in the specific LSDF to accommodate the accumulative trips generated by the various possible developments covered in the relevant LSDF.

It should be noted that if a particular development required additional road improvements, other than those identified in the relevant LSDF, then such road improvement costs will be in addition to the standard development levy imposed. In general, development levies relate to trips generated from a development in proportion to the overall trips generated by other developments in that LSDF, plus any other specific requirements. The specific requirements may include, but are not limited to, access arrangements, new road works to provide access to the development, and all internal roads.

### C.2.2 Quinera Area as per Mayoral Committee

Included below is an extract of the recommendations from a report approved by BCM regarding developmental contributions toward bulk engineering infrastructure applicable to the Quinera Area.

However, before using this section one must first referred to MC 129/07 of Council meeting 20 March 2007, which was withdrawn. The report was withdrawn to allow the Directorate of Engineering Services to refine their report, ie, The Development Levy Report. This has to date not been done, and therefore the section below is the only available method to use in calculating development levies in this area. One however must be cautioned when using it as there are definite short comings in the report.

Mayoral Committee Report 7 June 2005 has reference 408/05 and was approved by Council on 28 June 2005 under reference BCC 108/05.

The report recommended that a Development Levy be imposed upon those current and potential Developers along Quinera Drive to assist in funding the immediate provision of bulk engineering services to that area, consisting of a sewer main, water and electrical supply and an access road to full municipal standards, and that this Development levy be calculated as follows:-

$$\text{Development Levy} = \left[ \frac{\text{Total Cost of Bulk Infrastructure (R)}}{\text{Total Developable Area (m}^2\text{)}} \right] \times \text{Development Area}$$

Where

Total Cost of Bulk Infrastructure = all costs associated with providing the bulk engineering infrastructure to the area under consideration and will include consultants professional fees, costs associated with land acquisition, legal fees etc., PLUS the interest and redemption charges accrued up until the month of payment of the Development Levy, and

Total Developable Area = the total area within the area under consideration which will benefit directly from the infrastructure provided, but will exclude areas required for municipal services, flood plains etc.

### C.2.3 Development Levy for Beacon Bay LSDF

The approach in calculating development levies followed for this study is based on the determination of the number of estimated or potential new AM/PM peak trips (or other as may be determined by the BCM Transport Planning and Operations Department) from any given new development/rezoning in the study area. The trips generated are then multiplied by the cost factor for providing network improvements in the study area. See Table C.2.3 for illustrative development levy amounts. The amount calculated on the day of the development/rezoning application will be linked to the national CPI to ensure that should delays occur before the actual approval the amount payable will be in line with cost escalation.

Where a new public road facility is required, discount relating to land cost associated with provision of such public road space is applicable. The construction cost of the new road will however be recovered from the new developments in the area requiring the road. The cost of this new road will be over and above the amounts relating to Table C.2.3.

The detail of the calculation of the proposed new development levy is presented below.

**TABLE C.2.3: BB LSDF illustrative development levies.**

LAND USE	ERF AREA(m <sup>2</sup> )	AM PEAK TRIPS	ROAD COST
OFFICE	1000	15.4	R 30,800.00
RETAIL	1000	84.0	R 168,000.00
SHOP CENTRE	10 000	256.0	R 512,000.00
MIXED USE	1000	58.2	R 116,400.00

### Development Levy Calculation formulae

$$DL_i = DL_{trips\ i} + DL_{new\ road\ i}$$

Where

$$DL_i = \text{Development Levy for development } i$$

$$DL_{trips\ i} = \text{No. of trips generated } i * \text{cost per trip}$$

$$\text{Cost per trip} = \text{R } 2,000.00 \text{ (as at 1 January 2009 from which date the CPI is to be used to determine the exact amount as at the date of the Site Development Plan approval.)}$$

$$\text{No. of trips generated } i = \text{the greater of:}$$

1. Trips generated by development *i* in the AM/PM (whichever is the greater) Peak, or any other time as determined by the BCM Transport Planning and Operations Department,

*Or*

2. Full site development to single storey (refer to Table C.2.3 that indicates this cost per 1000 square meters of erf size *i*)

$$DL_{new\ road\ i} = \text{Proportional road cost } i - \text{Land expropriations costs } i$$

$$\text{Proportional road cost } i = A_{DI} / A_{TOTAL} * \text{Road cost}$$

$$A_{DI} = \text{Area of development } i \text{ developable land excluding area used for new public road/s}$$

$$A_{TOTAL} = \text{Total Area of Developable land requiring new public road/s, excluding total area used for new public road/s}$$



Road cost = Construction costs + Consultant fees + Land expropriation costs + any other costs associated with the construction of the new public road/s

**Note:** a) DLnew road *i* is only applicable where development *i* requires (at the discretion of the BCM Transport Planning and Operations Department) the new road/s for access or to open up the erf for development.

b) No deductions allowed in number of trips generated *i* for existing trips.

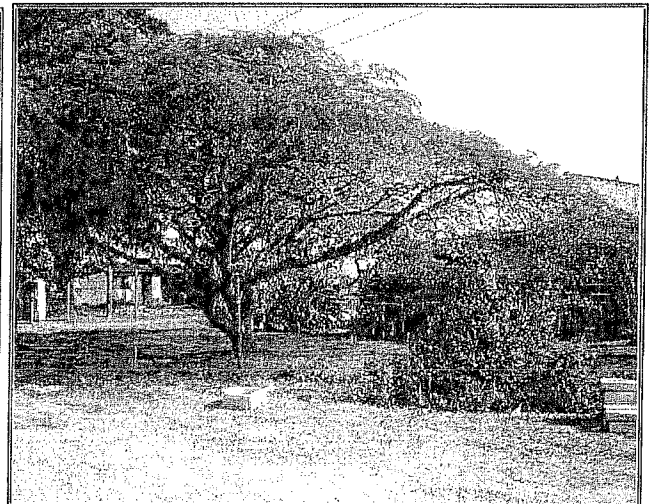
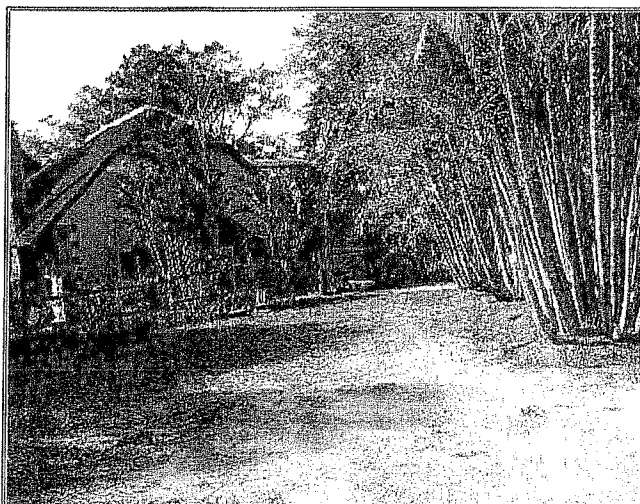
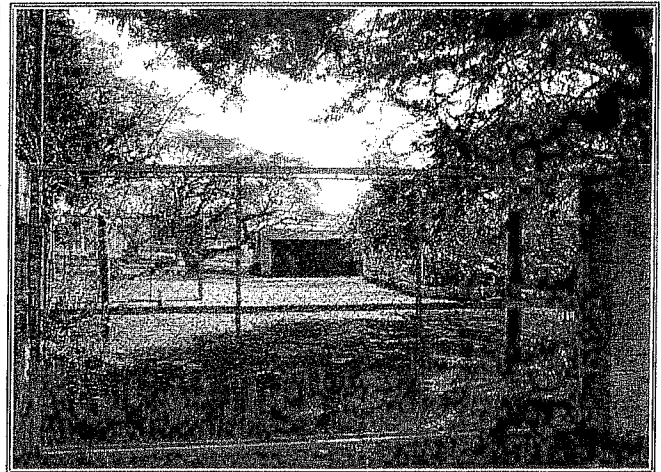
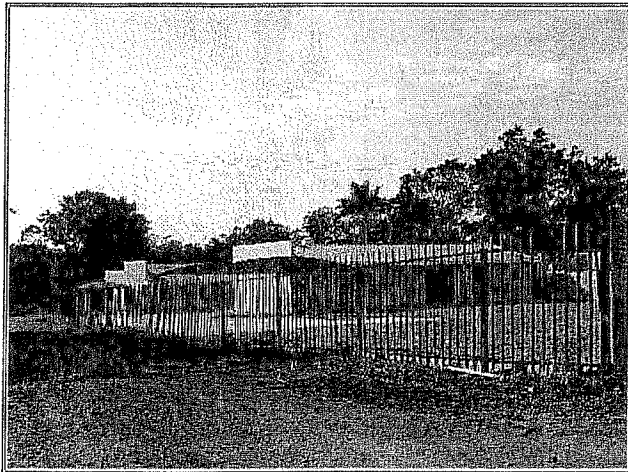
**ANNEXURE J**  
**Environmental Scoping Report**

## ENVIRONMENTAL EVALUATION OF ERVEN 3948 & 5712, BEACON BAY

### 1. Description of Physical and Landscape of Characteristics

Erven 3948 & 5712 are situated to the East of Triple Point Phase One and is bordered on the South by Quenera Drive in Beacon Bay. Erf 3948 measures 5476m<sup>2</sup> in extent. Erf 5712 measures 7348m<sup>2</sup>. Both erven are currently zoned for Agriculture Zone One purposes, however no agricultural activities have been practised on the sites for a number of years. The residential structures, which occupy about 10% of the sites, are still in good condition. The small vacant sections of the sites comprise of well maintained garden area. The site relatively flat. The properties bordering onto Erven 3948 & 5712 are all in the process of being developed stage and zoned to accommodate townhouses and offices alike. The general landscape, reflects an area with great development opportunities. No conservation worthy natural features are evident.

See photos of the site below.



## **2. Description of Ecological Characteristics**

Since Erven 3948 & 5712 have been utilised as a residential property for many years, no fauna or flora of any significant ecological value were detected on the site. The site is in a totally transformed state.

## **3. Current and Potential Land – Uses**

The subject site is currently being utilised for residential purposes,

Other land uses evident surrounding the subject property are summarised as follows:

- Residential properties;
- Smallholdings;
- Beacon Bay Life Hospital

## **4. Archaeological, Historical and Cultural Sites**

No archaeological, historical or cultural sites were observed during the site visit. Since the residential building on the site is not older than 60 years, no authorization is required to enable the demolition of the building.

## **5. Social and Economic Impact**

A positive impact is that desperately needed jobs will be created during both the construction phase and operational/maintenance phase. It is not anticipated that any negative impacts could develop as a result of this development.

## **6. Existing Infrastructure and Services**

Erven 110 & 111 is situated within Beacon Bay and is therefore completely served by the local municipal infrastructure.

The availability of capacity within the existing service networks to provide potable water and removal of sewage have been adequately addressed. See Engineering Services Report – Annexure G.

## **7. Present and Possible Pollution**

No visual and noise pollution will be created by the proposed development.

## **8. Risks or Hazards Posed by Development**

It is not anticipated that this development would pose any risks or hazards to neighbours or the environment.

## **9. Possible Mitigation Measures**

It is proposed that:

- During construction all required protocols in managing the building site and the potential impact on the surrounding properties and environment will be observed.
- The site should at all times be free of declared invader plants.
- The developer and site engineer monitor proceedings during construction in order to report and preserve any findings of archaeological value during excavation work.

## **10. Conclusion**

The proposed medium density townhouse and office development on Erven 3948 & 5712 will cause no short term nor long term detrimental environmental impacts.

**ANNEXURE K**  
**Deed of Servitudes**

MANLEY, EDDY & HENDERSON

S.G.No.  
552/1999

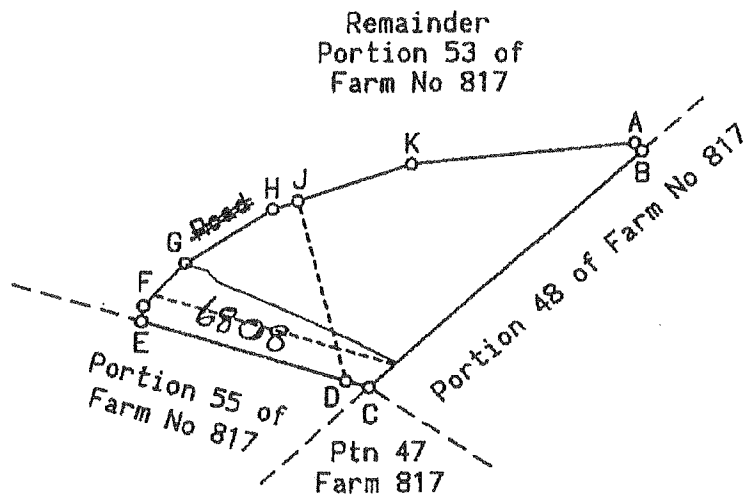
Approved  
*Alan Shong*  
for  
Surveyor-General  
1999-03-16

COMPONENTS

- 1) The figure ABCDJK represents Erf 3947 Beacon Bay.  
Vide Diagram No. 4128-90.D/T 4606/1991
- 2) The figure JDEFGH represents Erf 5711 Beacon Bay.  
Vide Diagram No. 551/1999

SERVITUDE NOTES

- i) The line DE represents the Southern Boundary of a 10m wide Servitude Right of Way. Vide Diagram No. 551/99.
- ii) The line CD represents the Southern Boundary of a 10m wide Servitude Right of Way. Vide Diagram No. 553/99.



Scale 1/2500

The figure A B C D E G H J K represents 7348 Square metres of land, being ERF 5712 BEACON BAY comprising 1) and 2) above

Situate in the Transitional Local Council and Administrative District of EAST LONDON PROVINCE OF THE EASTERN CAPE

*N.R. Henderson*

Compiled in January 1999 by me

N.R. Henderson PLS 0808 Professional Land Surveyor

<p>This diagram is annexed to No. <u>CT 3238/2001</u> Dated Registrar of deeds</p>	<p>The original diagrams are <del>is No.</del> as quoted above Attached to No.</p>	<p>File No. Eldn 817 S.R. No. Compiled <u>CSZ-432 (M349)</u> Comp: <u>GG-8888 (4856)</u> <u>CQSZ-23 (M327)</u> <u>EQSZ-41 (M330)</u></p>
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FOR ENDORSEMENTS SEE BACK OF DIAGRAM

5712

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THE FOLLOWING DEDUCTIONS HAVE BEEN MADE FROM THIS DIAGRAM

SURVEY RECORD	DIALING NO.	Subdivision	AREA H/SQ M	REMARKS	INITIALED	RECOR.
2227/2008	487/2008	6808	1516			

HUTTON  
& COOK  
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File No.  
TEL: (021) 042 3419

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GEREGISTREER  
REGISTERED  
REGISTRAR/REGISTRAR  
2004-05-28

K000039 2004/5

Notec. No: 379

## NOTARIAL DEED OF SERVITUDE

BE IT HEREBY MADE KNOWN that on this 16<sup>th</sup> day of April 2004 before me  
TALLIS FREDERICK HURLY, Notary Public, practising at East London, in the Province of  
the Eastern Cape, personally came and appeared

MABEL EDITH SWANEPOEL  
Identity No. 291006 0013 08 1  
Married out of community of property

(hereinafter referred to as the said Mabel Swanepoel)

and



**LEON CHARLES SWANEPOEL**  
Identity No. 550125 5111 08 2  
Unmarried

(hereinafter referred to as the said Leon Swanepoel)

**AND THE APPEARERS DECLARED THAT:**

WHEREAS the said Mabel Swanepoel is the registered owner of  
(Portion of Portion 73)  
REMAINDER PORTION 53 OF FARM 817 EAST LONDON  
BUFFALO CITY LOCAL MUNICIPALITY  
DIVISION OF EAST LONDON  
THE PROVINCE OF THE EASTERN CAPE  
IN EXTENT Seven comma Seven Four One One (7,741.1) Hectares  
(hereinafter referred to as the said Remainder Portion 53)

AND WHEREAS it is necessary to protect the existing access enjoyed by the said Leon  
Swanepoel over the said Remainder to the property described as

ERF 5712 BEACON BAY  
BUFFALO CITY LOCAL MUNICIPALITY  
DIVISION OF EAST LONDON  
THE PROVINCE OF THE EASTERN CAPE  
IN EXTENT Seven Thousand Three Hundred and Forty Eight (7348) Square Metres

owned by the said Leon Swanepoel under Certificate of Consolidated Title No.  
T.3238/2001.

AND WHEREAS the appearers are agreed that a servitude right of way 16 (sixteen)  
metres wide shall be registered over the said Remainder Portion 53 in favour of the said  
Erf 5712 Beacon Bay, without consideration of any kind being paid or received;

NOW THEREFORE/.....

**NOW THEREFORE THESE PRESENTS WITNESS:**

1. The said Mabel Swanepoel, as owner of  
(Portion of Portion 73)  
REMAINDER PORTION 53 OF FARM 817 EAST LONDON  
BUFFALO CITY LOCAL MUNICIPALITY  
DIVISION OF EAST LONDON  
THE PROVINCE OF THE EASTERN CAPE  
IN EXTENT Seven comma Seven Four One One (7,7411) Hectares

declares the said Remainder Portion 53 to be subject to a servitude of right of way 16 (sixteen) metres wide, the southern boundary of which is represented by, and along its entire length, the line EFGHJKAB on Diagram SG.552/1999 annexed to Certificate of Consolidated Title No. T.3288/2001 in favour of Erf 5712 Beacon Bay.

2. The said Mabel Swanepoel declares that no consideration for the creation of registration of the said servitude right of way, will be paid or received.

3. The said Leon Swanepoel as owner of  
ERF 5712 BEACON BAY  
BUFFALO CITY LOCAL MUNICIPALITY  
DIVISION OF EAST LONDON  
THE PROVINCE OF THE EASTERN CAPE  
IN EXTENT Seven Thousand Three Hundred and Forty Eight (7348) Square Metres

accepts the benefits conferred, and declares that no consideration will be paid or received.

THUS/.....



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HUTTON & COOK  
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No. 2470

GEREGISTREER  
REGISTERED  
REGISTRATEUR/REGISTRAR  
27 JUN 2001

DEELREG  
STAMPOLTY  
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FEEB R95,00

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NOTARY PUBLIC

Protocol No. 76

# NOTARIAL DEED OF SERVITUDE

BE IT HEREBY MADE KNOWN:

THAT on the 14<sup>TH</sup> day of MARCH 2001, before me

GRANT ANDREW BERNDT

Notary Public, practising as such at East London in the Republic of South Africa and in the presence of the subscribing witnesses, came and appeared :-

1. CHRISTOPHER JOHN ABDO, he being duly authorised hereto by virtue of a Power

A A 76

of Attorney granted in his favour at East London on the 31<sup>st</sup> day of JANUARY 2001 by **LEON CHARLES SWANEPOEL**, Identity No. 550125 5111 00 9, unmarried, which Power is filed with the Minute hereof in my Protocol,

he being the registered owner of land described as

Erf 3947 Beacon Bay  
Local Municipality of Buffalo City  
Division of East London  
Province of the Eastern Cape

IN EXTENT : 4910 (Four Thousand Nine Hundred and Ten) square metres  
HELD BY Deed of Transfer No.T 4606/1991

(which land is hereinafter referred to as "the first servient tenement")

and

2. **CHRISTOPHER JOHN ABDO**, he being duly authorised hereto by virtue of a Power of Attorney granted in his favour at East London on the 31<sup>st</sup> day of JANUARY 2001 by **MABEL EDITH SWANEPOEL**, Identity No. 291006 0013 08 1, married out of community of property, which Power is filed with the Minute hereof in my Protocol,

she being the registered owner of land described as

- (i) Remainder of Portion 53 (a Portion of Portion 73) of Farm 817 East London  
Local Municipality of Buffalo City  
Division of East London  
Province of the Eastern Cape

IN EXTENT : 7,7411 (Seven comma Seven Four One One) Hectares

HELD by Deed of Transfer No. T 1166/1962

(which land is hereinafter referred to as "the second servient tenement")

she being the registered owner of land described as

- (ii) Erf 3948 Beacon Bay  
Local Municipality of Buffalo City  
Division of East London  
Province of the Eastern Cape

IN EXTENT : 5476 (Five Thousand Four Hundred and Seventy Six) square metres

HELD by Certificate of Registered Title No. T 4605/1991

(which land is hereinafter referred to as "the third servient tenement")

and

3. **CHRISTOPHER JOHN ABDO**, he being duly authorised hereto by virtue of a Power of Attorney granted in his favour at East London on the 9<sup>TH</sup> day of MARCH 2001 by **CRAIG ANTHONY CHARLES SAM** in his capacity as acting Head : East London Administrative Unit as such representing the Local Municipality of Buffalo City, he being duly authorised thereto, which Power is filed with the Minute hereof, in my Protocol.

AND THE APPEARERS DECLARED :-

THAT WHEREAS the said **MABEL EDITH SWANEPOEL** is sub-dividing Remainder of Portion 53 (a Portion of Portion 73) of Farm 817 East London

AND WHEREAS the East London Transitional Local Council, now known as the Local Municipality of Buffalo City has imposed certain conditions upon Sub-Division over Erf 3947 Beacon Bay, Remainder of Portion 53 (a Portion of Portion 73) of Farm 817 East London and Erf 3948 Beacon Bay.

NOW THEREFORE these presents witness :-

That the land described as :-

Erf 3947 Beacon Bay  
Local Municipality of Buffalo City  
Division of East London  
Province of the Eastern Cape

IN EXTENT : 4910 (Four Thousand Nine Hundred and Ten) square metres  
HELD by Deed of Transfer No. T 4606/1991

Shall be subject to the following Servitude of Right of Way, reading :-

"Subject to a 10 metre wide Servitude of Right of Way, the southern boundary of which is represented by the line AB on Diagram SG No. 553/1989, in favour of the Local Municipality of Buffalo City."

That the land described as

Remainder of Portion 53 (a Portion of Portion 73) of Farm 817 East London  
Local Municipality of Buffalo City  
Division of East London  
Province of the Eastern Cape

IN EXTENT : 7,7411 (Seven comma Seven Four One One) hectares

HELD by Deed of Transfer No.: T1166/1962

Shall be subject to the following Servitude of Right of Way reading :-

"Subject to a Servitude of Right of Way, the area of which is represented by the figure abcdDCf on Diagram No. S.G. 551/1999 in favour of the Local Municipality of Buffalo City"



That the land described as

Erf 3948 Beacon Bay  
Local Municipality of Buffalo City  
Division of East London  
Province of the Eastern Cape

IN EXTENT : 5476 (Five Thousand Four Hundred and Seventy Six) square metres

HELD by Certificate of Registered Title No.T 4605/1991

Shall be subject to the following Servitude of Right of Way, reading :-

"Subject to a Servitude of Right of Way, the area of which is represented by the figure ABC on Diagram No. S.G. 554/1999 in favour of the Local Municipality of Buffalo City".

Subject to the following conditions :-

- (a) That no consideration shall be payable, by either party, in respect of the registration of the said Servitude. The parties however agree that the value of the rights granted herein is R100 00.
- (b) The cost of drawing and registering this Notarial Deed of Servitude shall be borne by the owner of the first servient tenement.

*[Handwritten signatures]*

*[Handwritten mark]*

AND the Appearer on behalf of the Local Municipality of Buffalo City, hereby accepts, insofar as necessary, the benefits of this Servitude, subject to the terms and conditions aforementioned.

THUS DONE AND EXECUTED AT EAST LONDON on the day, month and year first aforewritten in the presence of the undersigned witnesses and of, the Notary.

AS WITNESSES :

- 1. *[Handwritten Signature]* \_\_\_\_\_
  - 2. *[Handwritten Signature]* \_\_\_\_\_
- \_\_\_\_\_

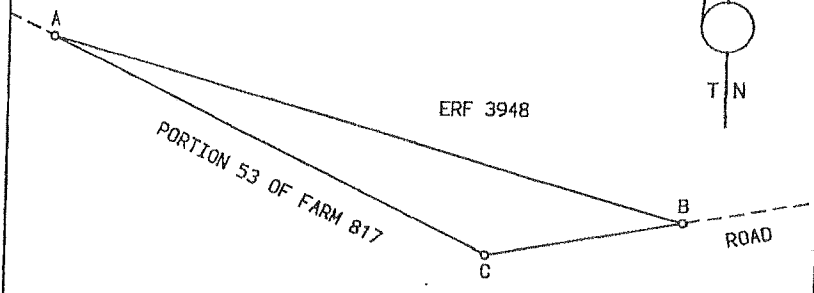
*[Handwritten Signature]*  
QUOD ATTESTOR  
*[Handwritten Signature]*  
NOTARY PUBLIC

SIDES(metres)	ANGLES OF DIRECTION	CO-ORDINATES Y SYSTEM Lo 27° X	
		CONSTANTS	± 0,00 +3 600 000,00
AB 13,02	286 03 00 A	- 88 399,17	+ 47 314,69
BC 3,93	79 54 20 B	- 88 411,68	+ 47 318,29
CA 9,65	116 22 50 C	- 88 407,81	+ 47 318,98
Quinera (No.367)	Δ	- 89 398,32	+ 48 549,24
Sand Pits (No.370)	Δ	- 90 078,65	+ 47 349,68

S.G.No.  
554/1999  
Approved  
*N.R. Henderson*  
for  
Surveyor-General  
1999-03-16

DESCRIPTION OF BEACONS

A,B,C \_\_\_\_\_ 12mm Round Iron Peg



Scale 1/100

The figure A B C represents a Servitude Right of Way Area over Erf 3948 Beacon Bay as indicated.

Situate in the Transitional Local Council and Administrative District of PROVINCE OF THE EASTERN CAPE

EAST LONDON

Surveyed in December 1998 and February 1999 by me

*N.R. Henderson*

N.R. Henderson PLS 0808 Professional Land Surveyor

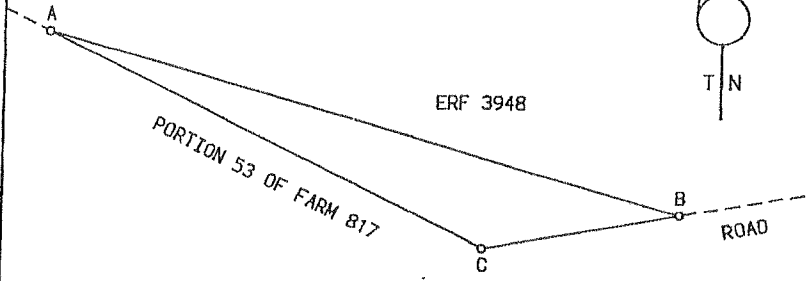
This diagram is annexed to No. Dated Registrar of deeds	The original diagram is No. 4129/1990 Attached to D/T No. 4605/1991	File No. E1dn 817 S.R. No. E1310/90 Comp: CQ-8888-(4856) CQSZ-23 (M327) CQSZ-41 (M330)
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SIDES(metres)	ANGLES OF DIRECTION	CO-ORDINATES		S. G. No.
		Y	X	
	CONSTANTS	± 0,00	+3 600 000,00	554/1999
AB	13,02	286 03 00	A - 88 399,17	+ 47 314,69
BC	3,93	79 54 20	B - 88 411,68	+ 47 318,29
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	Quinera (No.367)	Δ	- 89 398,32	+ 48 549,24
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Approved  
*N.R. Henderson*  
 for  
 Surveyor-General  
 1999-03-16

DESCRIPTION OF BEACONS

A,B,C \_\_\_\_\_ 12mm Round Iron Peg



Scale 1/100

The figure A B C represents a Servitude Right of Way Area over Erf 3948 Beacon Bay as indicated.

Situate in the Transitional Local Council and Administrative District of PROVINCE OF THE EASTERN CAPE

EAST LONDON

Surveyed in December 1998 and February 1999 by me

*N.R. Henderson*

N.R. Henderson PLS 0808 Professional Land Surveyor

This diagram is annexed to No. Dated Registrar of deeds	The original diagram is No. 4129/1990 Attached to D/T No. 4605/1991	File No. E1dn 817 S.R. No. E1310/90 Comp: GG-8888 (4856) CQSZ-23 (M327) CQSZ-41 (M330)
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