

Site Traffic Impact Assessment

For

**Proposed Multiple Unit Residential Development
situated on Erf 2954 Kingsburgh, also known as 4
Vaughan Goodwin Road, Shulton Park.**



Date: 10 October 2019

Report Number: NSA 1188 - 1 - 2019, Revision: 00

Assessing Authority: Ethekwini Municipality



**CONSULTING
ENGINEERS (PTY) LTD**
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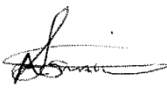
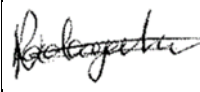
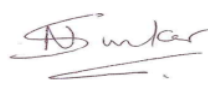
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CK No. 2016/491232/07

Document Tracking Sheet

Project Title		Proposed Multiple Unit Residential Development situated on Erf 2954 Kingsburgh, also known as 4 Vaughan Goodwin Road, Shulton Park		Project Number	
				NSA-1188-1	
Document Type		Site Traffic Assessment			
Version	Date	Project Number	NSA 1188-1- 2019		
00	10/10/2019	Description	Proposed Residential Development		
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Version	Date	Project Number			
		Description			
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Version	Date	Project Number			
		Description			
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10 October 2019

Head: Ethekwini Transport Authority

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Verification for Site Traffic Impact Assessment

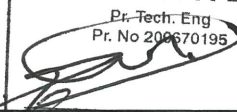
Proposed Multiple Unit Residential Development situated on Erf 2954 Kingsburgh, also known as 4 Vaughan Goodwin Road, Shulton Park

Report number: NSA 1188 - 1 - 2019

Revision 01

The undersigned, NSA Consulting Engineers cc, has been appointed as the registered professional for this Traffic Impact Assessment and has applied due diligence to the content of this report and endeavoured to ensure that the Traffic Impact Assessment is free of technical errors and takes full responsibility for its content.

We, NSA Consulting Engineers cc, also undertake to attend any forum where the Traffic Assessment is in dispute to report on matters that relate to the Traffic Impact Assessment. We understand and agree that the municipality shall not be liable to compensate us in this regard.

N. SUNKER
Pr. Tech. Eng
Pr. No 200670195

Sign

Signature

Full name: Mr. Neeraj Sunker on behalf of NSA Consulting Engineers cc

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TRAFFIC IMPACT ASSESSMENT CHECKLIST

Before a full review is conducted, the report will be checked for completeness. If the report is missing any of the items listed below, it will be returned for revision. If any content is not applicable this must be indicated (with reasons) as such under the section/s of the report

ETA Ref. No.:

Date of Application: 10 October 2019

Development Address: 4 Vaughan Goodwin Road, Shulton Park

Development Description: Erf 2954, Kingsburgh

Traffic Professional: NSA Consulting Engineers

Content	Yes	No	N/A	Comment
1. Traffic impact assessment cover	✓			
2. Letter signed by ECSA registered professional	✓			
3. Development Particulars	✓			
3.1. Development description and reference name	✓			
3.2. Location plan	✓			
3.3. Land use rights existing and applied, including type and extent of rights, list of land uses under proposed zoning including town planning controls	✓			
4. Study area	✓			
4.1 Study area plan or map indicated	✓			
5. Background information	✓			
5.1. Listed information – transport facilities and planning	✓			
5.2. Relevant information provided by municipality e.g. Framework plans, road classification, traffic models, etc.	✓			
5.3. Schematic diagram/s			✓	Does not apply
6. Site investigation	✓			
6.1. Documented and photographic record (e.g. road conditions, geometrics, operations, transport facilities, etc)	✓			
7. Traffic Demand Estimation	✓			
7.1. Carried out for worst case trip demand land use under the proposed change in land use or extent as stipulated in the town planning application	✓			
7.2. Assessment years	✓			
7.3 Assessment hours	✓			
7.4. Traffic counts not more than 2 years old – date and	✓			
7.5. Traffic growth rates	✓			
7.6. Trip generation rates	✓			
7.7. Modal split	✓			
8. Trip Distribution and Traffic Assignment	✓			
8.1. Manual trip distribution and assignment	✓			
8.2. Simulation software used for trip distribution and assignment			✓	Does not apply
8.3. Supporting information documented for traffic distribution			✓	Does not apply


8.4. Trip Distribution and Traffic Assignment diagrams	✓			
9. Total traffic demand – all aspects including diagrams	✓			
10. Site Impact Assessment	✓			
10.1. Assessment based on development application land use		✓		Does not apply
10.2. Design year horizon assessment		✓		Does not apply
10.2.1. “Without” proposed mitigating measures (with and without development)		✓		Does not apply
10.2.2. “With” proposed mitigating measures (with and without development)		✓		Does not apply
10.3. Planning year horizon assessment		✓		Does not apply
10.3.1. “With” proposed mitigating measures		✓		Does not apply
10.4. Functional road network – onsite and adjacent to site boundary / access points	✓			
10.5. Capacity / operational analysis	✓			
10.6 Road access and intersection provision	✓			
10.7. Intersection control warrants – e.g traffic signal to be approved by UTC branch			✓	Does not apply
10.8 Intersection, access and internal transport	✓			
10.9 Non-motorised transport requirements and design			✓	Does not apply
10.10 Public Transport requirements and design			✓	
10.11 Parking provision and design	✓			
10.12 Service delivery / heavy vehicle requirements and design			✓	
10.13 Drop and pick up facilities			✓	Does not apply
10.14 Eng Drawings, Cost estimate, Financial guarantees, and Undertaking for new or existing road improvements			✓	Does not apply
11. Recommendations	✓			
12. Appendix	✓			
12.1. Relevant Traffic Impact Assessment Correspondence.	✓			

Date: 10 October 2019

Name: Neeraj Sunker

Professional Registration Details:

PR 200670195



Signature

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A	Zoning Certificate & Town Planning Controls
B	Site Development Plans
C	ETA Building Plan Checklist
D	Traffic Counts and Verification Letter for Traffic Counts

1. Development Particulars

1.1 Development Description and Location

NSA Consulting Engineers was appointed to conduct a Site Traffic Assessment for the Proposed Multiple Unit Residential Developments. The properties that will accommodate these developments are in close proximity of each other, However cannot be consolidated due to existing environmental and topographical constraints. A Site Traffic Assessments will be carried out for each of the three properties.

The Multiple Unit Residential Development is situated on Erf 2954 Kingsburgh, also known as 4 Vaughan Goodwin Road, Shulton Park. The site is currently zoned to General Residential 5. The total site area is 39 739m².

This Report is in support of the Site Traffic Assessment 1 for the proposed Multiple Unit Residential Development only.

The site locality and aerial photograph is illustrated in Figure 1 and Figure 2.

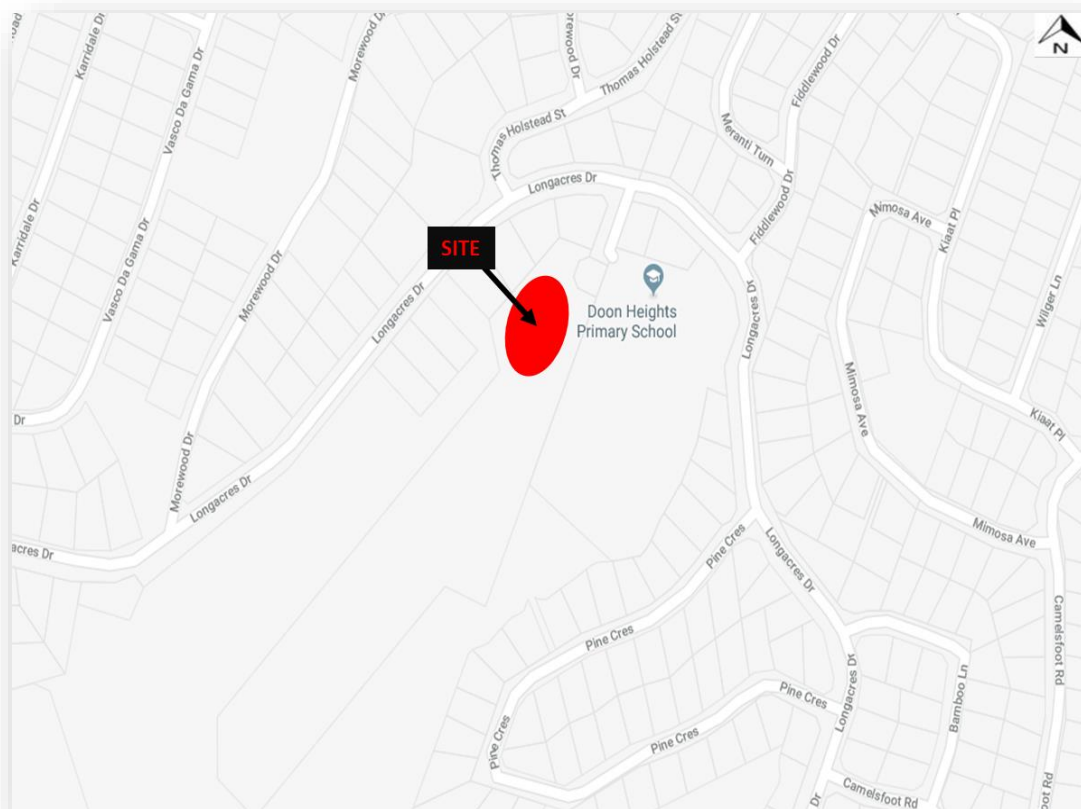


Figure 1: Locality Plan



Figure 2: Aerial Photograph of Site

1.2 Land Use

Current Zoning:	General Residential 5
FAR:	0.35
Coverage:	30%
Height:	2 Storeys
Min Erf:	1 800 m ²
Site Area:	39 739m ²

The Zoning Certificate and Town Planning Controls for the proposed development is illustrated on Annexure A.

2. Proposed Development

The proposed development will consist of a Multiple Unit Residential Development, with a maximum of 82 Residential Units. Each unit will consist of a maximum of two bedrooms.

Table 1: Proposed Multiple Unit Residential Development

Property	Units	Access Point
Site Traffic Assessment 1		
4 Vaughan Goodwin Road, Shulton Park also known as Erf 2954, Kingsburgh	82 Residential Units	Cul-De-Sac Vaughan Goodwin Road
Site Traffic Assessment 2		
26 Boekenhout Drive, Shulton Park also known as Erf 2955, Kingsburgh	42 Residential Units	Cul-De-Sac Boekenhout Drive
Site Traffic Assessment 3		
61 Karridale Drive, Shulton Park also known as Erf 2956, Kingsburgh	60 Residential Units	Cul-De-Sac Karridale Drive
Total	188 Residential Units	

The Site Development Plans was done by North Coast Architects and is illustrated on Annexure B.

3. Study Area

The study consists of evaluating the impacts of the proposed development and developing mitigating measures where negative impacts exists in order to meet the requirements of the relevant authorities.

In general, the scope of traffic studies is limited to intersections (and road networks) that will deteriorate significantly, due to the development-generated traffic. It is common cause that the traffic impacts of new developments are concentrated on the immediate transportation network with these impacts dissipating rapidly further away from the development as more access opportunities become available and traffic disperses onto the broader road network.

Consequently, the impacts of the proposed development are limited to adjacent road network, with the key focus on the intersection of Vaughan Goodwin Road and Longacres Drive.

The Road Network is illustrated in Figure 3.

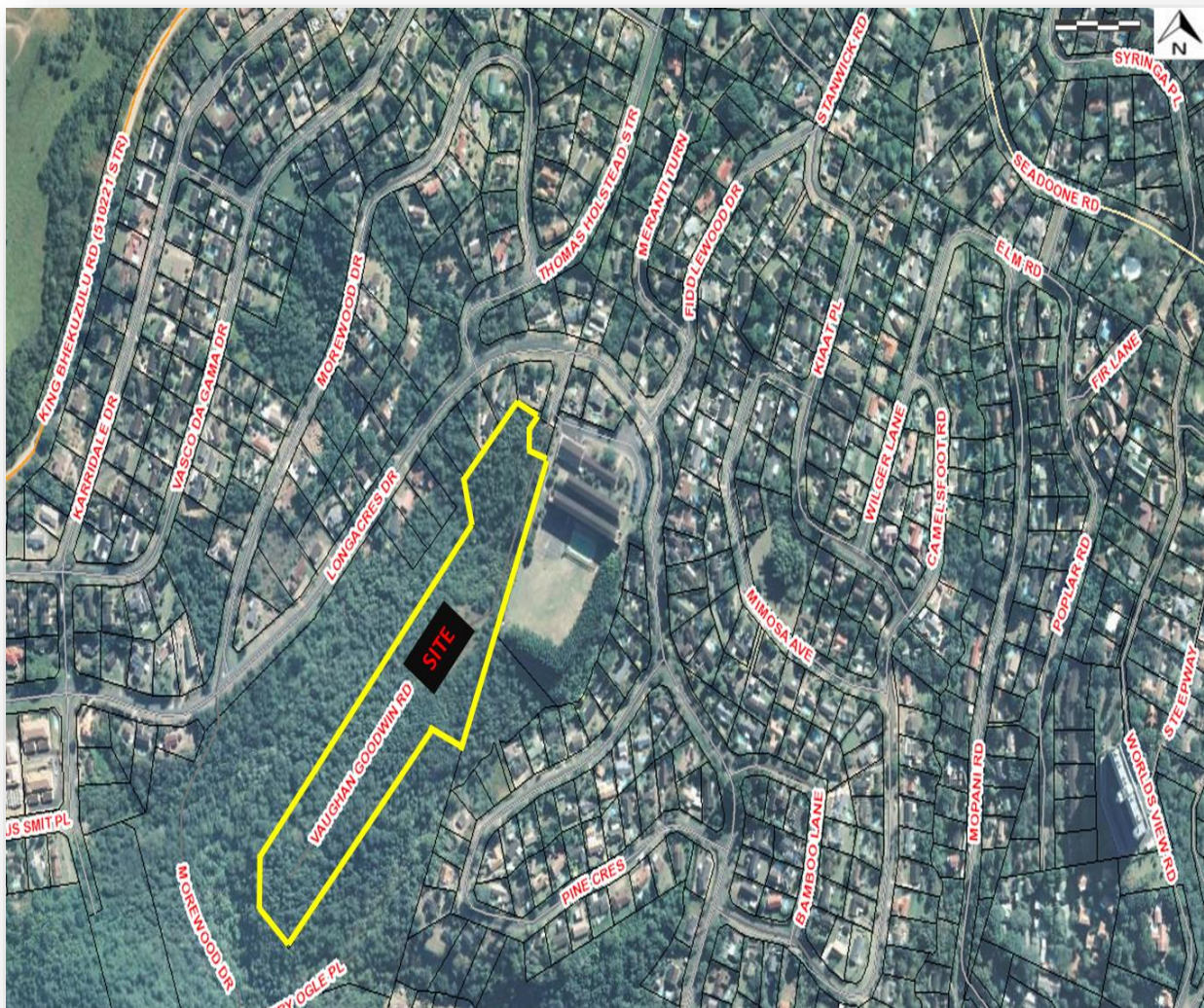


Figure 3: Road Network

4. Background Information

Road Name:	Vaughan Goodwin Road
Road Width:	Varies between 5.1m – 5.2m
Road Reserve:	18.0m
Road Class:	Class 5
Number of Lanes:	1 in each direction
Region:	South Region
Authority:	Ethekwini Municipality
Surface:	Asphalt
Speed Humps:	N/A
Sidewalks:	No (Grassed Verges)
Street Lighting:	Yes
Line Marking:	Centre Line – Dashed White Line

Road Name:	Longacres Drive
Road Width:	Varies between 6.1m – 6.3m
Road Reserve:	24.0m
Road Class:	Class 5
Number of Lanes:	1 in each direction
Region:	South Region
Authority:	Ethekwini Municipality
Surface:	Asphalt
Speed Humps:	Yes
Sidewalks:	No (Grassed Verges)
Street Lighting:	Yes
Line Marking:	Centre Line – solid white line

Table 2: Road Classification System

Class 1*	Freeway – High mobility, no or very limited at grade access. No traffic calming	1010veh/hr/lane
Class 2*	Major Arterial / Regional Distributor – High mobility, limited at grade access (intersections), no direct property access. No traffic calming.	820veh/hr/lane
Class 3*	Arterial / Major Collector – Balanced mobility and accessibility function. Traffic calming only to consist of signage and road markings.	790veh/hr/lane
Class 4**	Collector – More accessibility, less mobility, direct property access. All types of traffic calming allowed.	As Per ETA Manual
Class 5**	Local Street – Limited mobility, more accessibility. All types of traffic calming allowed including speed humps.	As Per ETA Manual

*Source: Highway Capacity Manual 2000 – Exhibit 10-7

**Source: ETA Manual October 2015 PG: 28

5. Site Investigation

Observations during the AM peak hour revealed that there is moderate flow of traffic along Longacres Drive due to neighbourhood school Doon Heights Primary School and their Edu-Care Center and Aftercare Facility. Vaughan Goodwin Road forms a stop intersection with Longacres Drive. The proposed development is situated at the end of the cul-de-sac on Vaughan Goodwin Road. The area is predominantly residential in nature.

Vaughan Goodwin Road also provides access to two residential properties as well as Doon Heights Primary School for the Teachers and parents. The access to Doon Heights Primary School is via an automated automatic gate that provides entrance only access. Students are dropped off inside the school and parents exit via the exit only access on Longacres Drive. The exit only access on Longacres Drive also provides for an outside drop off facility for parents as well as organised lift clubs that do not wish to enter the school. The school operational hours are from 07:45am – 13:30pm. However, kids are dropped off for school from 06:45am.

The Edu-Care Center and Aftercare Facility is located on Longacres Drive. There is an outside drop off facility for parents and organised lift clubs. There are teachers that escort the kids from the drop off area into the facility making it convenient for the parents and the drivers. The operational hours are 06:30am – 12:30pm and the Aftercare operates until 17:00pm.

Observations during the AM Peak Hour show that the Minibus-taxis that operate along Longacres Drive are the organised lift clubs for Doon Heights Primary School and the Edu-care Centre and Aftercare facility .

The existing developments, accesses and drop off facilities/points that have been discussed above is illustrated in the Figures below.



Figure 4: Existing Developments and Accesses



Figure 5: Proposed Site on Vaughan Goodwin Road



Figure 6: Intersection of Vaughan Goodwin Road and Longacres Drive facing west



Figure 7: Intersection of Vaughan Goodwin Road and Longacres Drive facing east



Figure 8: Vaughan Goodwin Road and Doon Heights Primary School Entrance only



Figure 9: Intersection of Vaughan Goodwin Road and Longacres Drive facing south



Figure 10: Doon Heights Primary School automatic Entrance only

6. Traffic Demand Estimation

6.1 Worst Case Scenario

Current Zoning:	General Residential 5
FAR:	0.35
Coverage:	30%
Height:	2 Storeys
Min Erf:	1 800 m ²
Site Area:	39 739m ²

The General Residential 5 free entry zoning rights include the following:

- Hotel
- Flat
- Dwelling House
- Boarding House
- Chalet Development
- Conservation Area
- Private Open Space
- Public Open Space
- Multiple Unit Development.
- Retirement Centre.

The proposed development is within the General Residential 5 free entry zoning rights, Multiple Unit Development.

6.2 Assessment years

A 5-year (2024) analysis is required, i.e. in accordance with the recommendations of the “Ethekwini Transport Authority Manual for Traffic Impact Assessments and Site Traffic Assessments.”

6.3 Assessment Hours

The existing assessment was done for a weekday AM peak (07h00– 08h00) and PM Peak (16h30– 17h30).

6.4 Existing traffic counts

The traffic counts were conducted under normal weather conditions by NSA Consulting Engineers on Tuesday 30th January 2018, Saturday 03rd February 2018 and Sunday 04th February 2018

- NSA Consulting Engineers - Intersection of Vaughan Goodwin Road and Longacres Drive.

It is noted that this is a STA and therefore no intersection analysis is required.

Existing traffic volumes are illustrated on Figures 11 and 12.

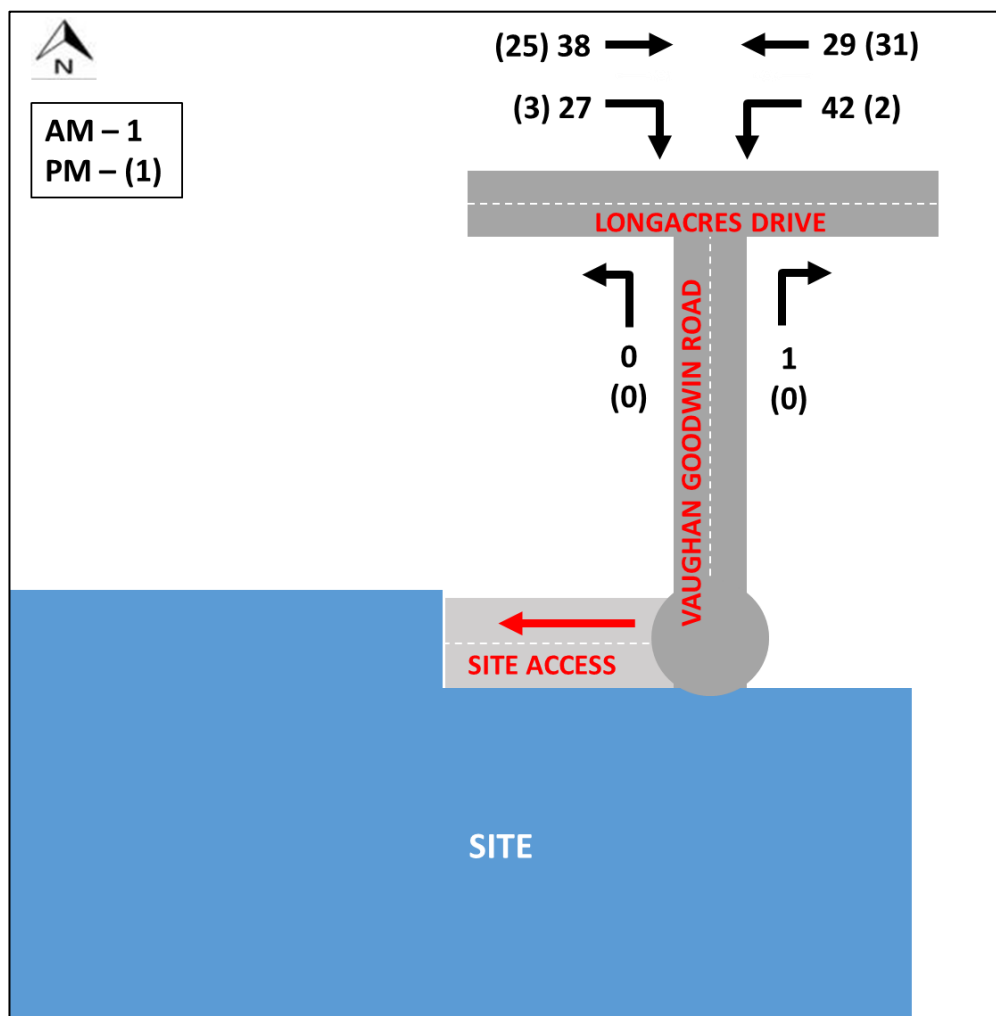


Figure 11: Existing Traffic Counts – Weekday AM/PM

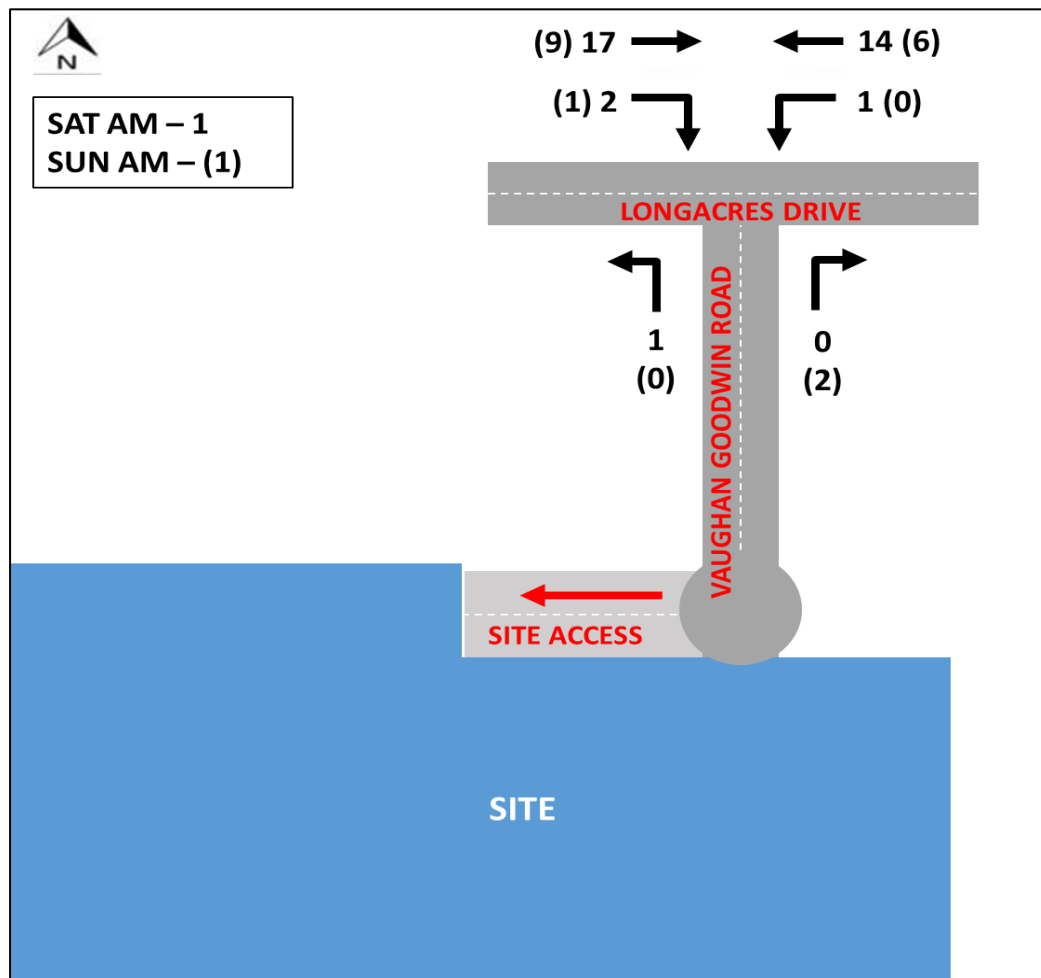


Figure 12: Existing Traffic Counts – Weekend Counts

6.5 Traffic growth rates

We have assumed a growth rate of 2% for 5 years.

6.6 Trip generation rates

6.6.1 Worst Case Scenario

Not applicable to this Statement.

6.6.2 Proposed Development

Multiple Unit Residential Development – 82 Residential Units

The trip generation rate for the proposed residential land use as per the 'eThekweni Transport Authority manual for Traffic Impact Assessments (October 2015)' is 1.3 trips/Unit during the AM and PM peak.

This is consistent with land use code 210 for Residential Dwelling Units. Summary of the trip generation is illustrated on Table 3 below.

Table 3: Trip Generation – Multiple Unit Residential Development

Land Use		No. of Units	Rate	No. of Trips	Split Ratio	Split in/out
Multiple Unit Residential Development	AM	82	1.3	107	25:75	27:80
	PM	82	1.3	107	70:30	75:32
	SAT	82	0.65	53	50:50	27:26
	SUN	82	0.65	53	50:50	26:27

6.6.3 Trip Adjustment Factor

Not applicable to this Statement.

6.6.4 Pass-By and Diverted Trips

Not applicable to this Statement.

6.6.5 Adjusted Trip Generation

Not applicable to this Statement.

6.6.6 Trip Reduction Factors

Not applicable to this Statement.

6.6.7 Summary of Trip Generation

Summary of the trip generation for the proposed development is illustrated on Table 4 below.

Table 4: Summary of Proposed Development Trip Generation

Land Use	Peak	Units	No. of Trips	Split Ratio	Split in/out
Multiple Unit Residential Development	Weekday AM	82	107	25:75	27:80
	Weekday PM	82	107	70:30	75:32
	SAT	82	53	50:50	27:26
	SUN	82	53	50:50	26:27

Observation revealed that the Saturday and Sunday counts are approximately 55% - 60% lower than the Weekday AM and PM count. Therefore, the total combination of the background plus development resulted in the worst case being the AM and PM Peak period.

It is noted that this is a STA and therefore no intersection analysis is required. The site access analysis is illustrated in Section 9.

6.7 Modal split

A large percentage of the commuters will be using private vehicles.

7. Trip Distribution and Traffic Assignment

For any proposed development, it is necessary to identify and estimate the proportional distribution of traffic along the roads that approach the site from various areas. The trip distribution is based on the ratio of the existing traffic volumes and turning movement.

Using this method of analysis, the trip assignment and trip distribution for the proposed development, has been assigned onto the surrounding road network.

The resultant development traffic distribution and assignment diagrams are shown in Figures 13 & 14 respectively.

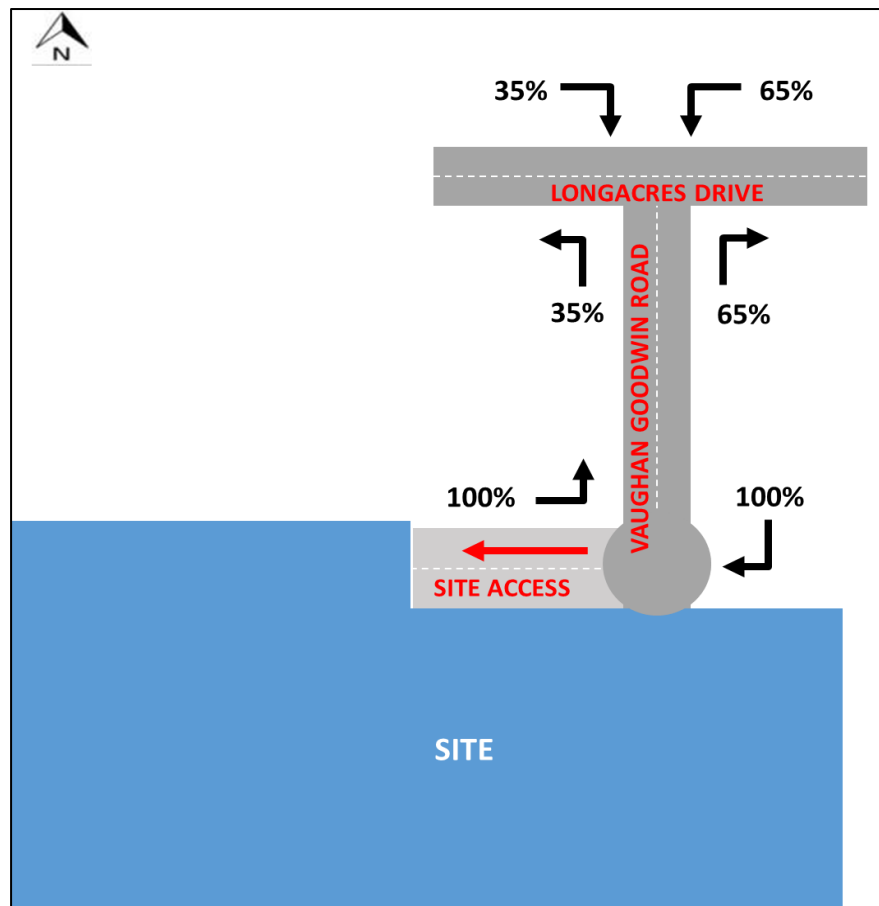


Figure 13: Trip Distribution

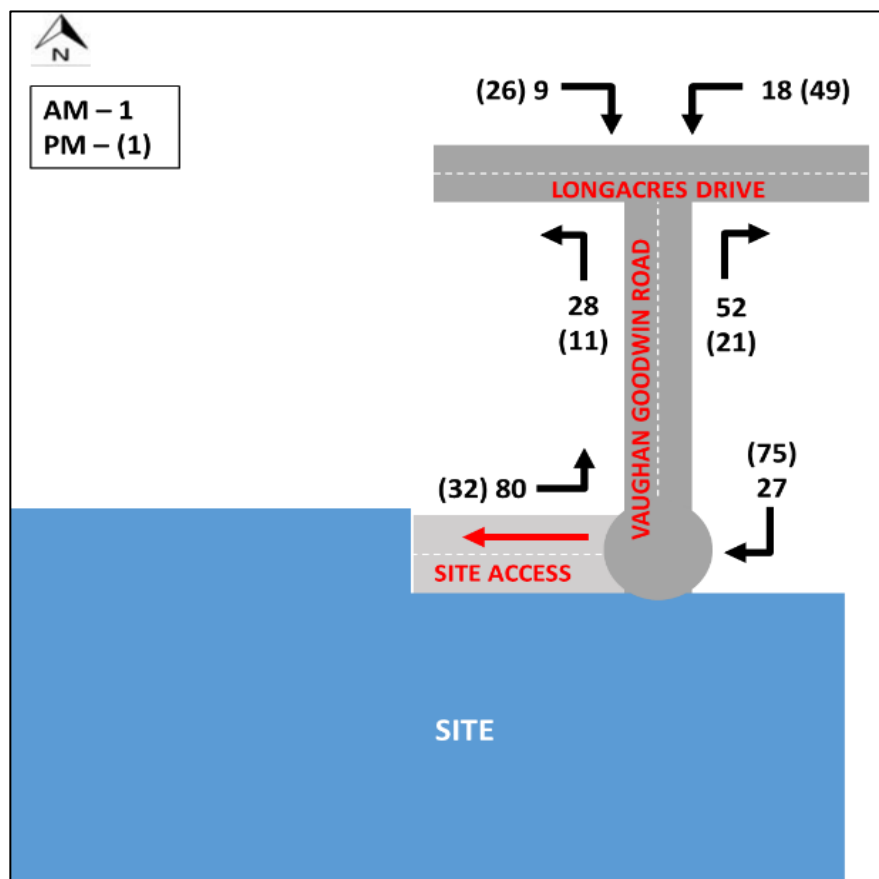


Figure 14: Trip Assignments - Residential Apartments

8. Total Traffic Demand

The total traffic demand which includes background traffic, development traffic and future traffic for the 2018 and 2024 analysis year diagrams is shown in Figures 15 and 16, respectively.

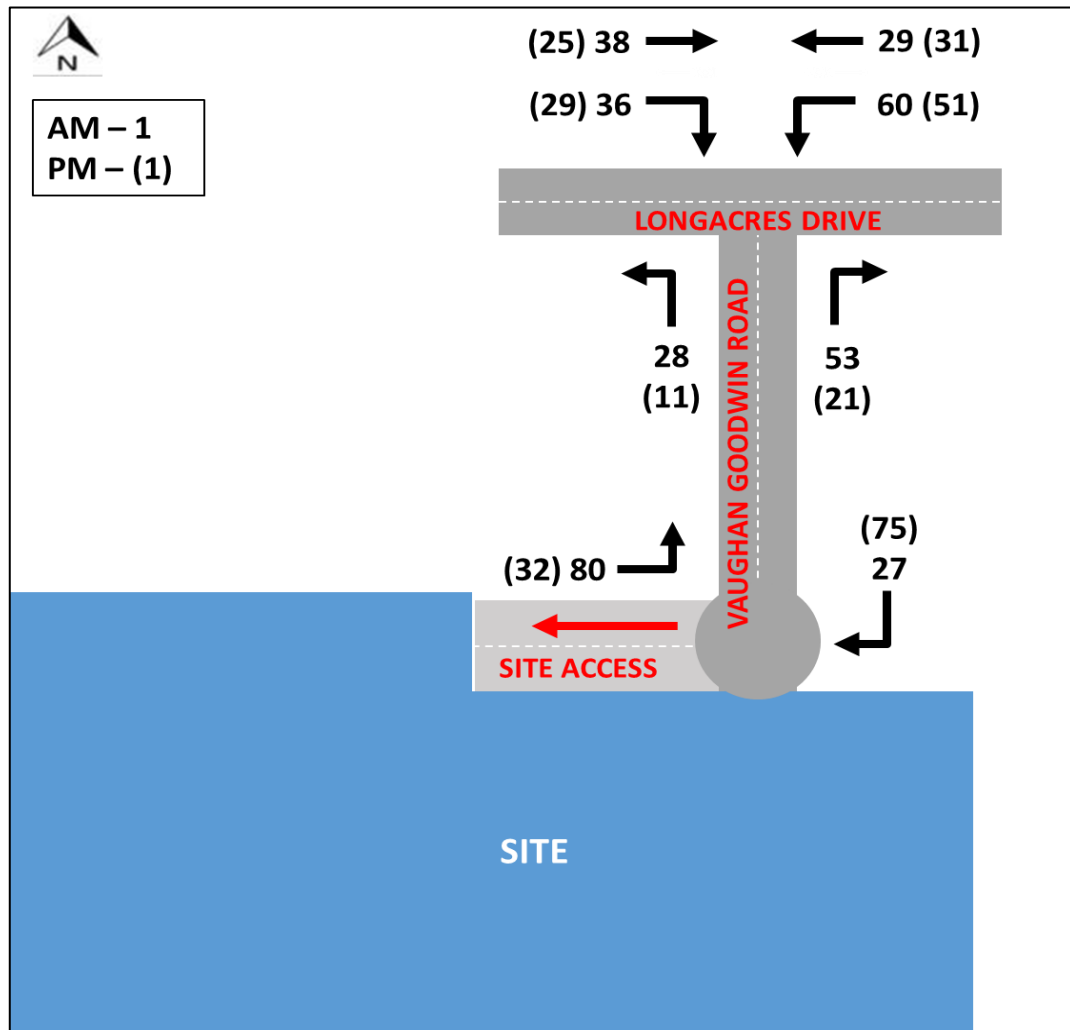


Figure 15: Existing 2018 plus Development

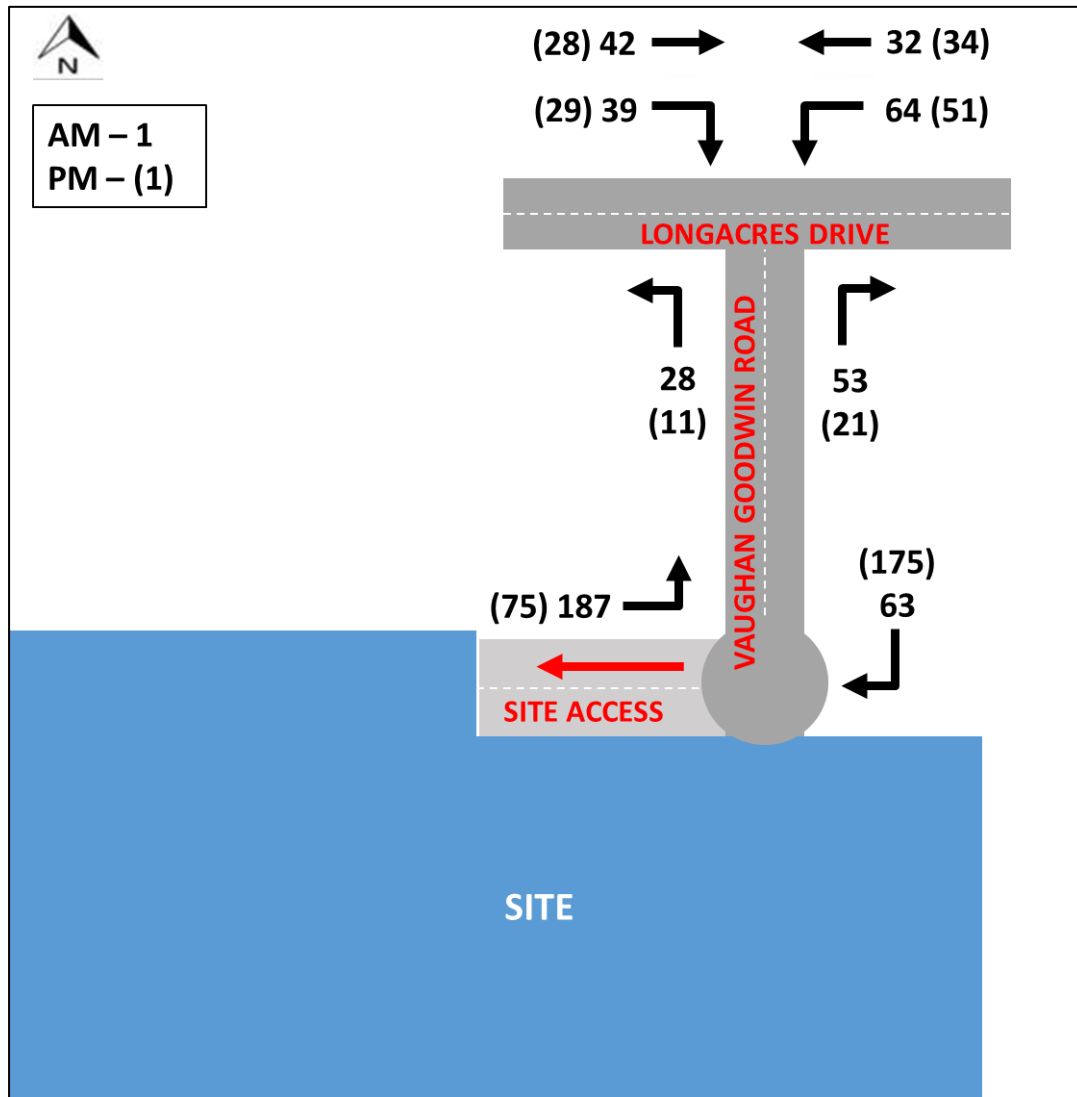


Figure 16: Forecasted 2024

It is noted that this is a STA and therefore no intersection analysis is required. The access analysis is done in Section 9 of this report.

9. Site Impact Assessment

9.1 Site Impact Assessment Scenarios

The development is within the free entry landuse therefore no intersection analysis is required.

9.2 Access

Access to the proposed development will be via Vaughan Goodwin Road and will be full directional. The access will have to be a minimum of 6m wide in order to accommodate 2-way traffic movements.

Stopping Sight Distance for Vaughan Goodwin Road

According to the UTG 7: Geometric Design of Urban Local Residential Roads, the manual requires a minimum sight distance of 45m for a design speed of 40km/hr. The proposed development is situated at the cul-de-sac therefore, sight distance is not required.

The access will be designed in accordance with the eThekweni Transport Authority's standards and specifications. All driveway ramps are to have a maximum gradient of 15% with a minimum 30m vertical curve radius.

All accesses are to be designed to the standards and specification of the ETA.

Table 5: Location of Access Egress/Ingress

Road Class of Primary Road	Min. access spacing on side street from intersection with primary road (m)
4/5	20
3	60
1/2	120

Source: eThekweni Transport Authority Manual for Traffic Impact Assessments and Site Traffic Assessments (October 2015).

The proposed access positions for the development is illustrated on figure 17 below.



Figure 17: Access Position

Please take note that Vaughan Goodwin Road is a Class 5 Road and the minimum access spacing has been checked according to Table 5 above.

The proposed development access is situated on Vaughan Goodwin Road at the cul-de-sac, there are no straight movements pass the proposed development therefore there is no access analysis.

9.3 Queuing Analysis

With reference to Section 5.7.5 Access Control of the EtheKwini Transport Authority manual for Traffic Impact Assessments (October 2015), the determination of the storage length can be done by the following formula:

$$\text{Traffic Ratio} = \frac{\text{Total Volume/PHF}}{\text{Service Flow Rate}} \times 100$$

With reference to Table 5.8 of the ETA Manual, the service rate for Remote Controlled Gates will be used for the Access of the proposed development; the access will be free entry and will allow 450 vehicles per hour per lane to enter the parking lot.

The worst-case scenario would be the Weekday PM peak with a total of 75 trips.

$$\begin{aligned}\text{Traffic Ratio} &= \frac{75/1.0}{450} \times 100 \\ &= 16.667\end{aligned}$$

From Table 5.9 of the ETA Manual, the proposed development will require 1 channel which will allow for 1 vehicle storage. Therefore, the minimum queue length is 6.5m from the boundary edge for the Access.

Should the developer wish to install Remote Controlled Gates, these will need to be a minimum of 6.5m from the boundary edge with one entrance lane and one exit lane.

9.4 Heavy/ Delivery Vehicles

Not applicable to this Statement.

9.5 Parking

Ample parking is a significant factor for any successful development. Parking should be adequate in number and design to facilitate easy manoeuvrability.

Table 6: Minimum Parking Standard for Residential Developments

Land Use	Parking Standard
Dwelling unit with 1 bedroom	1,0 bay/unit
Dwelling unit with 2 bedroom	1,0 bay/unit
Dwelling unit with 3 bedroom	1,5 bay/unit
Dwelling unit with 4 bedroom	2,0 bay/unit
Visitors	0,5 bay/unit

The parking for the proposed developments is illustrated on Table 7.

Table 7: Parking requirements for proposed development

Land Use	Development Units / Area (m ²)	Parking Standard	Parking Required
Multiple Unit Residential Development	2 Bedrooms x 82	1,0 bay/unit	82
	Visitors	0,5 bay/unit	41
Total Required			123

The proposed new residential units will require 123 parking bays within the curtilage of the site. However, the proposed development provides for 125 parking bays as per the site development plans done by North Coast Architects.

The minimum parking requirement is a town planning item and hence the final amount of parking that is required will be determined by the eThekweni Municipality town planning department.

All parking facilities, accesses and driveways are to be designed and dimensioned in accordance with the schedule of guidelines for off-street parking.

10. Pedestrians and Public Transport

10.1 Public Transport

Seadoone Road, Stanwick Road and School Road are classified as a public transport routes however there is no public transport facilities along these route.

There are adequate sidewalks along Seadoone Road, Stanwick Road and School Road.

Please Note: The Proposed Multiple Unit Residential Development does not have a material effect on public transport.

10.2 Pedestrians

Longacres Drive and Vaughan Goodwin Road has grassed verges and streetlights.

11. Transport requirements and Cost

Not applicable to this report.

12. Link Analysis

The link analysis for road Classes 1 to 3 will be determined using the Highway Capacity Manual 2000. The link analysis is based on the following capacities per lane:

- Class 1 – 1010 veh/hr/lane
- Class 2 - 820 veh/hr/lane
- Class 3 - 790 veh/hr/lane

With reference to Section 5.3.3 of the Ethekwini Transport Authority manual for Traffic Impact Assessments (October 2015), the determination of the link analysis can be done by using the following formulas for a Class 4 and 5 roads (two-lane two-way road):

- Class 4: Capacity = $142.86 \times \text{width} - 285.71$
- Class 5: Capacity = $120 \times \text{width} - 340$

Vaughan Goodwin Road is a 5.1m – 5.2m wide Class 5 road with 1 lane in each direction. Therefore the road capacity is 272-284 veh/hr.

Longacres Drive Road is a 6.1m – 6.3m wide Class 5 road with 1 lane in each direction. Therefore the road capacity is 392-416 veh/hr.

The link analysis is illustrated on the figure 18 below.

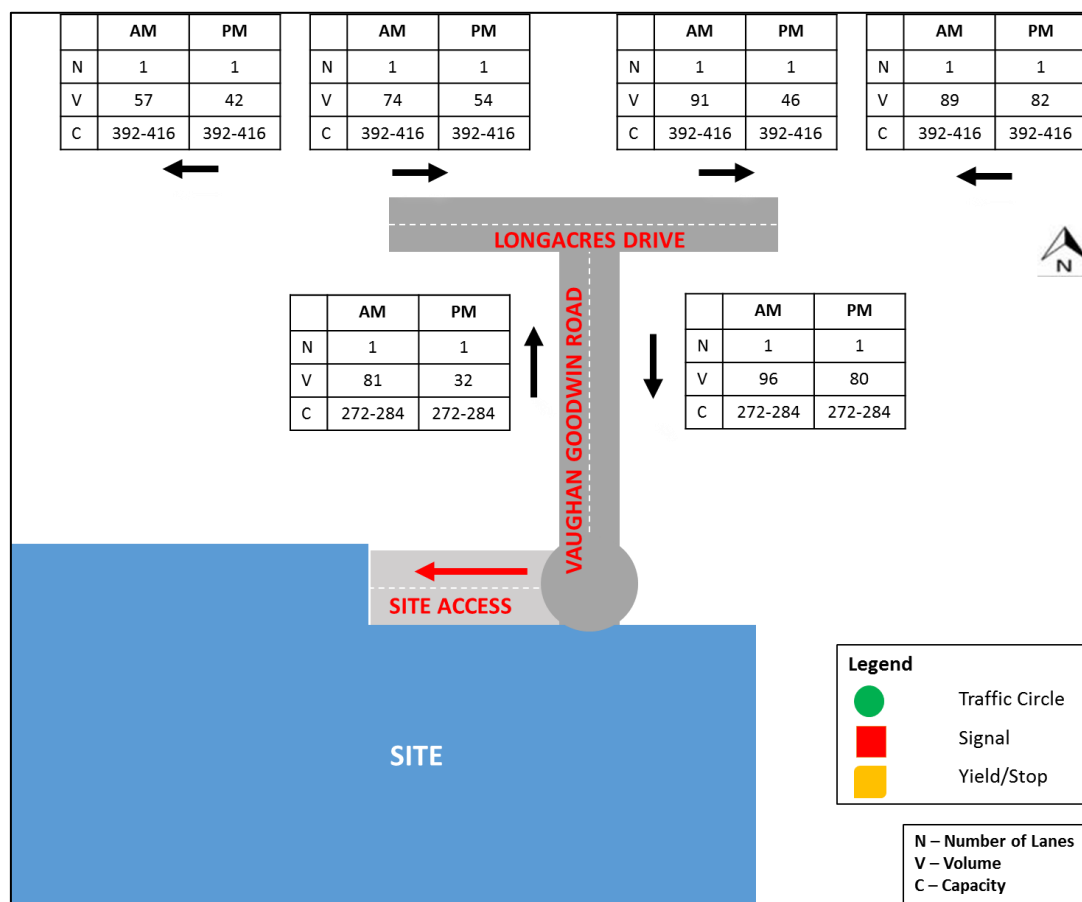


Figure 18: Link Analysis – Existing plus Development

From the above analysis it can be seen that Longacres Dive and Vaughan Goodwin Road is operating within capacity.

13. Proposed Improvements

Not Applicable to this statement.

14. Site Development Plan Assessment

All site development plans will be assessed in terms of the Ethekwini Transport Authority assessment checklist.

It is the responsibility of the Architect / Client to ensure all minimum standards are complied with. The Assessment Checklist will include but is not limited to the following:

1	Site traffic assessment required (refer to STA checklist)
2	Engineering Drawings, Cost estimate, Financial guarantees, and Undertakings for new or existing road improvements
3	Light vehicle access/driveway
3.1	Access location dimension from property beacon to center line of access Access location from intersection: Min. 150m from class 1 / 2 roads Min. 60m from class 3 roads Min. 20m class 4 / 5 roads
3.2	Access width at road edge
3.3	Access scoop shown/access hardening shown (refer to Access Detail)
3.4	Access / driveway long section to be shown (refer to Access Detail)
3.5	Access width at boundary to be max. 9m
3.6	Min. access width / driveway widths (refer to Table 1)
3.7	Two-way driveway/ramp width min. 3m may be allowed if serving ≤ 6 parking bays (no pedestrians)
3.8	Max. gradient 1:8 if access/driveway used by pedestrians
3.9	Max. gradient 1:7 if access/driveway used by light vehicles only
4.0	Heavy vehicle access/driveway
4.1	Access location dimension from property beacon to center line of access Access location from intersection: Min. 150m from class 1 / 2 roads Min. 60m from class 3 roads Min. 20m class 4 / 5 roads
4.2	Access width at road edge based on heavy vehicle tracking and tracking shown Access width at boundary max. 9m
4.3	Access scoop / access hardening shown (refer to Access Detail)
4.4	Access / driveway long section to be shown (refer to Access Detail)
4.5	Min. access width / driveway widths (refer to Table 1)
4.6	Max. gradient for access/driveway 1:10
5.0	Ramps
5.1	Light vehicle ramps grade max. 1:7
5.2	Heavy vehicle ramp grade max. 1:10
5.3	Max. gradient for parking ramps 1:15
5.4	Min. ramp widths (refer to Table 1)
6.0	Parking and loading
6.1	Max. gradient across parking area 1:15
6.2	Light vehicle parking area min. height clearance 2.5m
6.3	Loading vehicle parking area min. height clearance 4.5m
6.4	Parking / loading bay dimensions – refer to Town Planning : <i>Minimum Standards for Parking and Loading Facilities to be Provided Within Any Site</i>
6.5	Aisle width adequate for two-way/one-way – refer to Town Planning : <i>Minimum Standards for Parking and Loading Facilities to be Provided Within Any Site</i>
6.6	Vehicle tracking for loading areas
6.7	No. of loading bays – refer to Town Planning : <i>Minimum Standards for Parking and Loading Facilities to be Provided Within Any Site</i>

6.8	No. of light vehicle parking bays relaxed from 4.9m depth to 4.6m only if less than 10% of the total parking
6.9	Parking bay width for light vehicles relaxed to max. 0.1m if isolated parking areas
6.10	Min. one access (ingress and egress) for max. 400 parking bays
6.11	Full frontal access to parking from road not permitted
6.12	Tandem parking bays permitted <u>only if</u> surplus to parking requirements
7.0	Additional/General
7.1	Boundary wall / fence to be shown for all developments (excluding single dwelling house – single unit per site)
7.2	Petrol service station (PSS) frontage min. 36m
7.3	Pump island for PSS min. 5m from site boundary
7.4	PSS clear visibility of min. 120m in both directions at height of 1.37m from point of egress
7.5	PSS not to be sited on a road having gradient at any point within 120m of any point of access to the PSS > 1:7
7.6	Heavy vehicle access control (gate/boom/security control) to be setback based on requirements of ETA Manual for Site Traffic and Traffic Impact Assessments– or waived if building plan endorsed that ‘access to remain open during business operating hours’
7.7	Light vehicle access control (gate/boom/security control) to be setback based on requirements of ETA Manual for Site Traffic and Traffic Impact Assessments - or waived if building plan endorsed that ‘access to remain open during business operating hours’
7.8	Left-in-left out access designed and endorsed on plan
7.9	Accesses to be clearly annotated for type of vehicle use (light/heavy veh. or both)

See the complete assessment checklist illustrated on Annexure C.

Please note that the architect's drawings need to comply with the minimum standards as detailed in the table above.

The Site Development Plan was done by North Coast Architects.

15. Recommendations

1. This Report is in support of the Site Traffic Assessment for the proposed multiple unit residential development.
2. The proposed development is situated on Erf 2954 Kingsburgh.
3. The proposed development is also known 4 Vaughan Goodwin Road, Shulton Park.
4. The total site area is 39 739m²
5. The proposed development is currently zoned to General Residential 5.
6. The proposed development is within the General Residential Free entry zoning rights.
7. The table below illustrates the trips generated by the proposed development.

Trip Generation – summary of trip generation

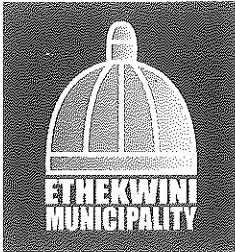
Land Use	Peak	Units	No. of Trips	Split Ratio	Split in/out
Multiple Unit Residential Development	Weekday AM	82	107	25:75	27:80
	Weekday PM	82	107	70:30	75:32
	SAT	82	53	50:50	27:26
	SUN	82	53	50:50	26:27

8. All Access Requirements are discussed in section 9.2 of this Report.
9. All parking is discussed in section 9.5 of this Report.
10. All parking to be provided within the curtilage of the site and the parking requirements to be confirmed by the town planning department.
11. All parking facilities, accesses and driveways are to be designed and dimensioned in accordance with the schedule of guidelines for off-street parking.

12. All road improvements are discussed in section 13 of this report.
13. All vehicles to enter and leave the site in a forward gear
14. All driveway ramps to have a maximum gradient of 15% with a minimum 30m vertical curve radius.
15. All internal roads are to be designed in conjunction with the Guidelines for Human Settlement planning and Design (Red Book).

ANNEXURE A

**Zoning Certificate & Town Planning
Controls**



SUSTAINABLE DEVELOPMENT & CITY ENTERPRISES

Development Planning, Environment & Management Unit

166 K E Masinga Road, Durban, 4001
P O Box 680, Durban, 4000
Tel: 031 311 1111, Fax: 031 311 7776
www.durban.gov.za

Ref: ZC 052/17/S
Enquiries: R. Heeralall-Bhoora
Tel: 031 3115843

Date: 10 July 2017

ZONING CERTIFICATE

ERF 2954 KINGSBURGH

This serves to certify:

THAT the property described as **Erf 2954 Kingsburgh** is within the jurisdiction of the eThekweni Municipality (South), and is zoned **General Residential 5** in terms of the South Scheme.

Yours Sincerely

MR T B MBHELE

HEAD: DEVELOPMENT PLANNING, ENVIRONMENT & MANAGEMENT

DISCLAIMER:

The controls given above are those specific to the land use zone in which the property falls. However, attention is drawn to the Town Planning Scheme Regulations, in certain cases, additional requirements can be called for at the discretion of the Deputy Head: Development Planning and no information recorded above can be taken as comprehensive. Specific detailed information can only be given in respect of an application after it has been lodged showing the detailed proposals of the development.

REMARKS:

Note 1: This information has been compiled at the above date, but as the Town Planning Scheme is in course of preparation it may be amended from time to time.

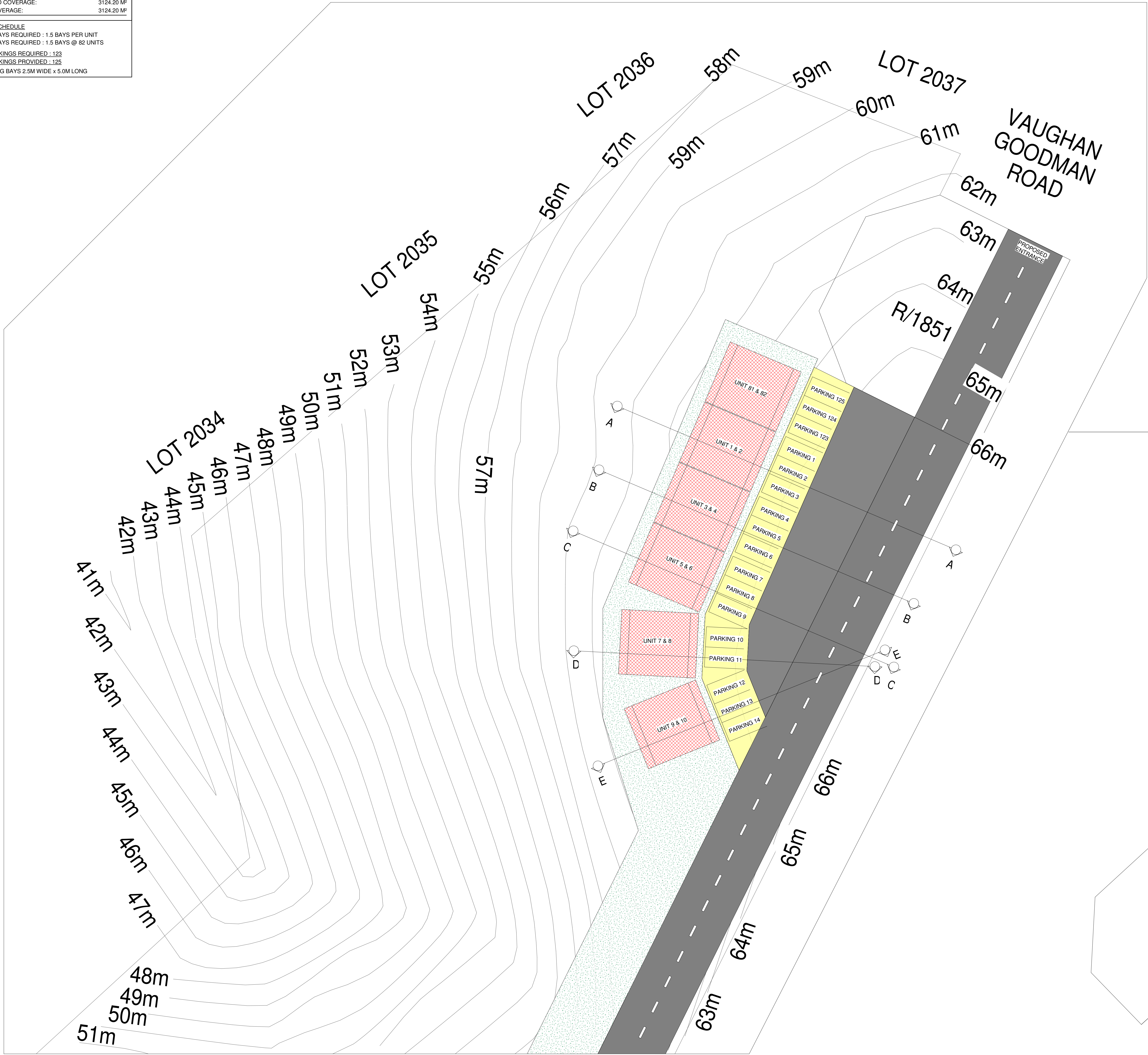
Note 2: The information given is in respect of Land Use Management requirements only and must not be construed as indicating requirements in terms of any By-Laws, the National Building Regulations, Environmental Legislations or any restrictive conditions in Title Deeds.

ZONE: GENERAL RESIDENTIAL 5						
SCHEME INTENTION: To provide, preserve, use land or buildings for higher density on all types of residential accommodation. A wide range of ancillary uses which service the day to day needs of a residential community. MAP COLOURREFERENCE: BROWN BACKGROUND WITH PINK VERTICAL HATCH						
MAP REFERENCE: SS/05/2012						
PRIMARY	SPECIAL CONSENT	PRECLUDED				
<ul style="list-style-type: none">• Boarding House• Chalet Development• Conservation Area• *Dwelling House• Flat• Hotel• Multiple Unit Development• Private Open Space• Public Open Space• Retirement Centre	<ul style="list-style-type: none">• *BTTS• Crèche• *Health Studio• Laundry• Mobile Home Park & Camping Ground• *Restaurant / Fast Food Outlet• *Shop• Special Building	<ul style="list-style-type: none">• Action Sports Bar• Adult Premises• Agricultural Activity• Agricultural Land• Airport• Arts and Crafts Workshop• Beach Amenity Facility• Betting Depot• Builder's Yard• Car Wash• Cemetery/ Crematorium• Container Depot• Convention Centre• Correctional Facility• Direct Access Service Centre• Display Area• Dive Charter• Educational Establishment• Escort Agency• Flea Market• Fuelling and Service Station• Funeral Parlour• Garden Nursery• Golf Driving Range• Government / Municipal• Health & Beauty Clinic• Industry - Extractive• Industry – General• Industry – Light• Industry – Noxious• Institution• Landfill• Mortuary• Motor Garage• Motor Display Area• Motor Vehicle Test Centre• Motor Workshop• Museum• Nature Reserve• Night Club• Office• Office – Medical• Parkade• Pet Grooming Parlour• Place of Public Entertainment• Place of Public of Worship• Recycling Centre• Reform School• Refuse Disposal• Restricted Building• Riding Stables• Scrap Yard• Transport Depot• Truck Stop• Veterinary Clinic• Warehouse• Zoological Garden				
ADDITIONAL CONTROLS						
<p>1. All landscaping at the discretion of the eThekweni Municipality.</p> <p>2. *Restaurant/Fast Food Outlet/Shop restricted to the ground floor in a Flat only.</p> <p>3.*BTTS shall mean Base Telecommunications Transmission Station.</p> <p>4. Where an Erf is used exclusively for a Dwelling House the sides and rear spaces shall 2.0 metres.</p> <p>5.*A shop may be permitted to cater for the day to day needs of the residents only.</p> <p>6.*A Health Studio may be permitted for the exclusive use of the residents only.</p> <p>7.*A Dwelling House shall have a Floor Area Ratio of 0.4, Coverage of 40 % and a Height of 3 storeys.</p> <p>8. Refer to Section 9.5 of this Scheme for the procedure and requirements of a Multiple Unit Development.</p>						
DEVELOPMENT PARAMETERS						
SPACE ABOUT BUILDINGS		DWELLING UNITS PER HECTARE	MIN ERF SIZE	HEIGHT	COVERAGE	FLOOR AREA RATIO
BUILDING LINE: FRONT	BUILDING LINE: SIDE AND REAR					
7.5 m	4.5 m	N/A	1 800 m²	2	30 %	0.35

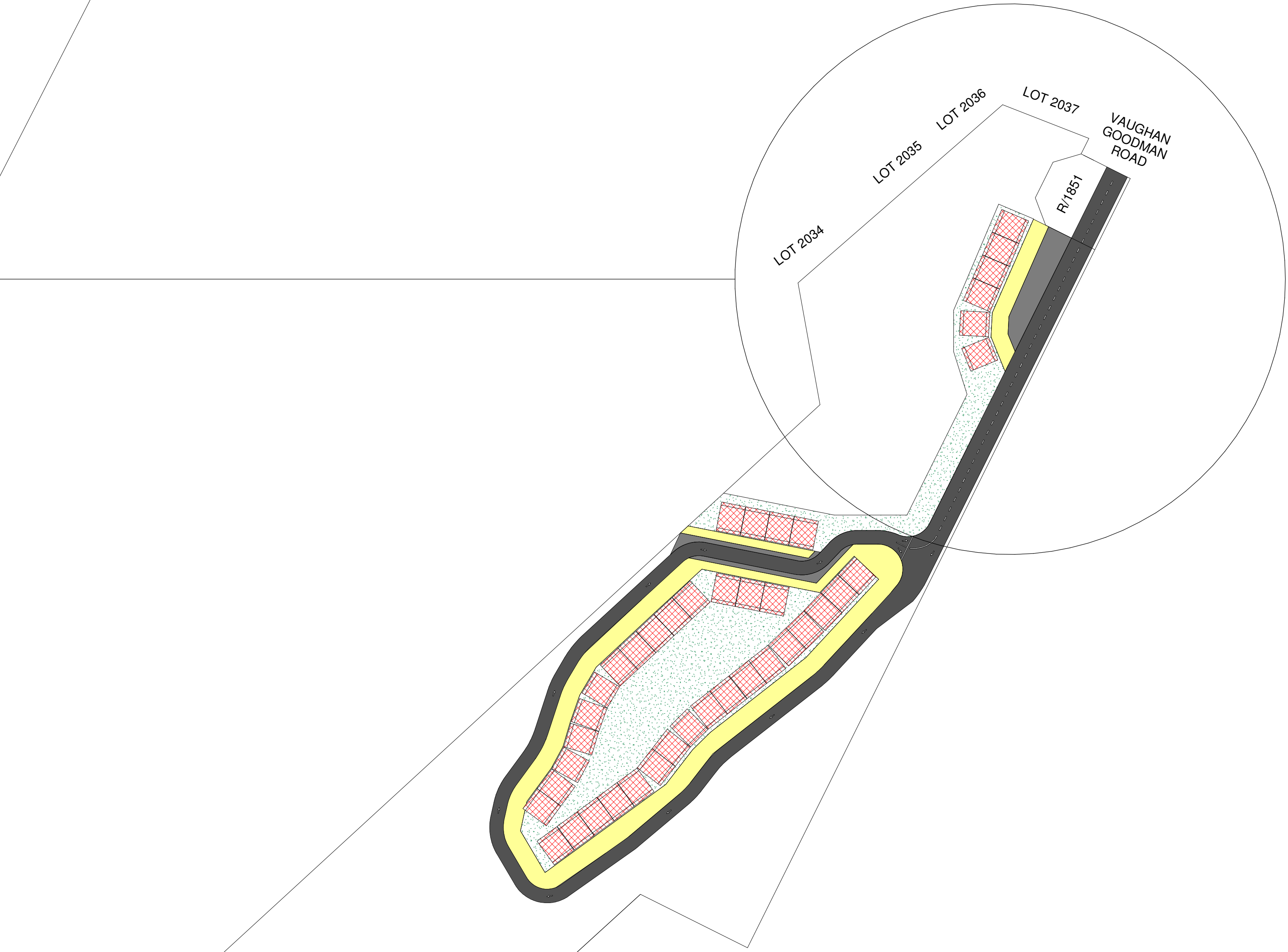
ANNEXURE B

Site Development Plans


AREAS & COVERAGE	
AREA OF SITE	(GROSS)39739.00 M² (NETT)39739.00 M²
*NOTE: NETT IS THE SITE AREA EXCLUDING ANY ROAD SERVICITUDES OR PUBLIC RIGHT OF WAY.	
SCHEDULE OF AREAS	
EXISTING FLOOR AREA:	0.00 M²
PROPOSED FLOOR AREA:	4920 M²
TOTAL FLOOR AREA:	4920 M²
EXISTING COVERAGE:	0.00 M²
PROPOSED COVERAGE:	3124.20 M²
TOTAL COVERAGE:	3124.20 M²
PARKING SCHEDULE	
PARKING BAYS REQUIRED : 1.5 BAYS PER UNIT	
PARKING BAYS REQUIRED : 1.5 BAYS @ 82 UNITS	
TOTAL PARKINGS REQUIRED : 123	
TOTAL PARKINGS PROVIDED : 125	
ALL PARKING BAYS 2.5M WIDE x 5.0M LONG	



S SITE PLAN SHEET 1
1 : 200



LP LOCALITY PLAN SHEET 1
1 : 1000


north coast
architects
proud members of the 'go green initiative'

A DIVISION OF GUADAGNINO BROTHERS CONSULTING
MAX GUADAGNINO
OFFICE : 084 987 3364
EMAIL : info@nbc-architects.com
http://www.facebook.com/northcoastarchitects

REVISIONS

REV.	DATE:	DESCRIPTION	REV. BY:

PROJECT

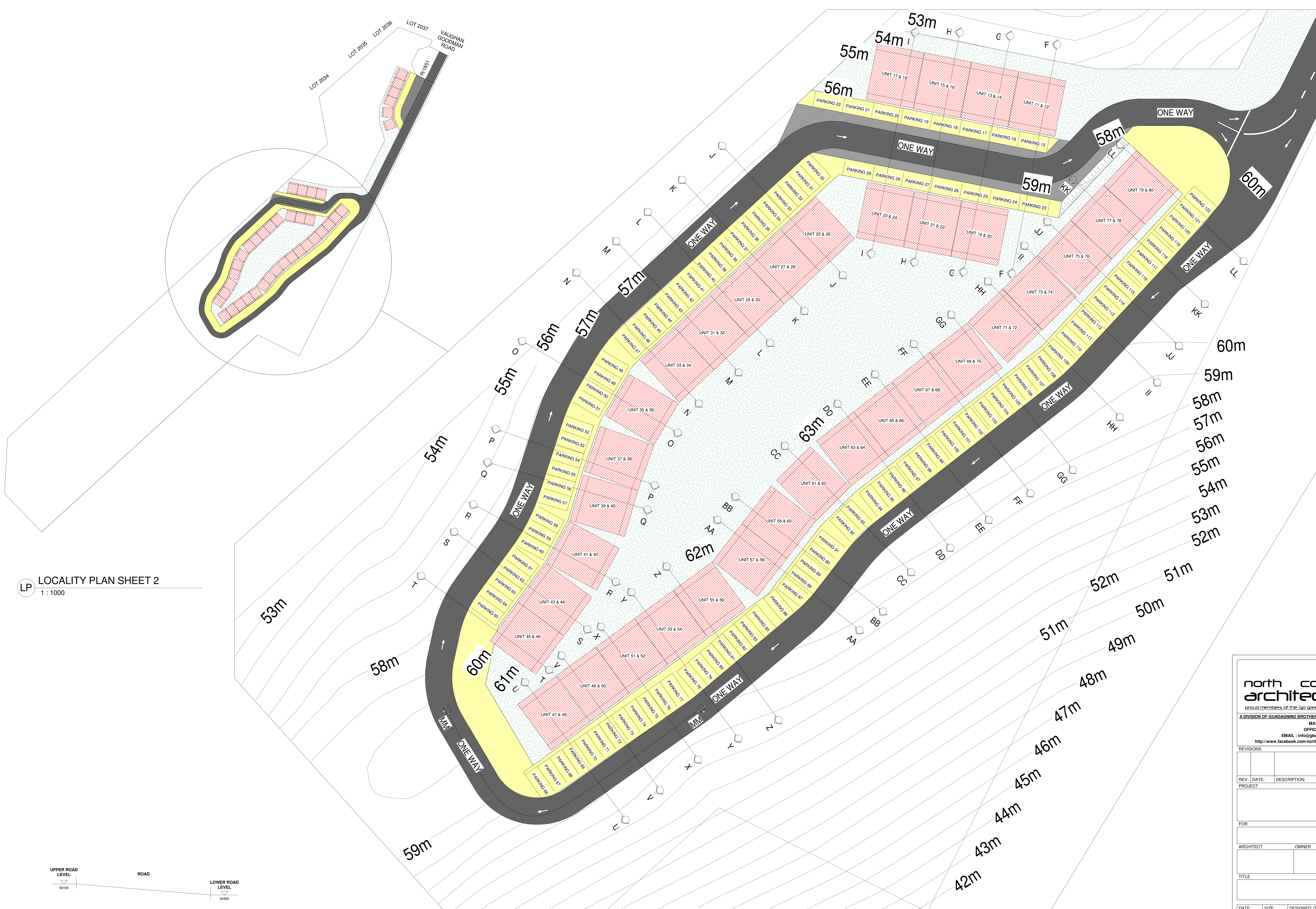
FOR

ARCHITECT

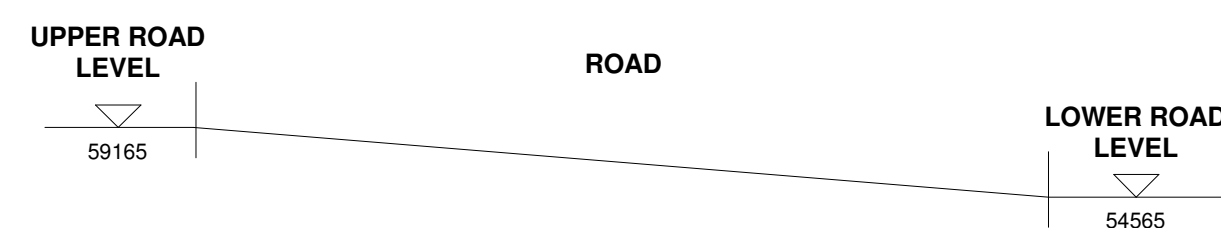
OWNER

TITLE

DATE:	SIZE:	DESIGNED: GUADAGNINO
BUILDING CLASSIFICATION:		R.C.D REG. NO. CAD36694926
DRG. NO.:		DRAWN: GUADAGNINO
		R.C.D REG. NO. CAD36694926
		CHECKED: PAJ CALITZ
		P.R.D REG. NO. D2766



LP LOCALITY PLAN SHEET 2
1 : 1000



MM SECTION MM-MM
1 : 500

S SITE PLAN SHEET 2
1 : 200



north coast architects
proud members of the 'go green initiative'

A DIVISION OF GUADAGNINO BROTHERS CONSULTING

MAX GUADAGNINO
OFFICE : 084 087 5364
EMAIL : info@nbc-architects.com
http://www.facebook.com/northcoastarchitects

REVISIONS		
REV.	DATE	DESCRIPTION

PROJECT	
FOR	ARCHITECT
OWNER	TITLE

DATE	SIZE	DESIGNED
BY: GUADAGNINO	R.C.D. REG. NO. CAD3684926	MAX GUADAGNINO
CHECKED: P.J. CALITZ	P.R.D. REG. NO. D2766	OFFICE : 084 087 5364

ANNEXURE C

ETA Building Plan Checklist



ETHEKWINI TRANSPORT AUTHORITY

30 Archie Gumede Place | Durban | 4001

P O Box 680 | Durban | 4000

Tel: 031 311 7344 | Fax: 031 305 5871

www.durban.gov.za

SITE DEVELOPMENT / BUILDING PLAN ASSESSMENT CHECKLIST

ETA Ref. No.:.....

Date of Application:.....

Development Address:.....

Development Description:.....

	YES	NO	N/A
Site traffic assessment required (refer to STA checklist)			
Engineering Drawings, Cost estimate, Financial guarantees, and Undertakings for new or existing road improvements			
Light vehicle access/driveway			
Access location dimension from property beacon to center line of access Access location from intersection: Min. 150m from class 1 / 2 roads Min. 60m from class 3 roads Min. 20m class 4 / 5 roads			
Access width at road edge			
Access scoop shown/access hardening shown (refer to Access Detail)			
Access / driveway long section to be shown (refer to Access Detail)			
Access width at boundary to be max. 9m			
Min. access width / driveway widths (refer to Table 1)			
Two-way driveway/ramp width min. 3m may be allowed if serving ≤ 6 parking bays (no pedestrians)			
Max. gradient 1:8 if access/driveway used by pedestrians			
Max. gradient 1:7 if access/driveway used by light vehicles only			
Heavy vehicle access/driveway			
Access location dimension from property beacon to center line of access Access location from intersection: Min. 150m from class 1 / 2 roads Min. 60m from class 3 roads Min. 20m class 4 / 5 roads			
Access width at road edge based on heavy vehicle tracking and tracking shown Access width at boundary max. 9m			
Access scoop / access hardening shown (refer to Access Detail)			
Access / driveway long section to be shown (refer to Access Detail)			
Min. access width / driveway widths (refer to Table 1)			
Max. gradient for access/driveway 1:10			
Ramps			
Light vehicle ramps grade max. 1:7			
Heavy vehicle ramp grade max. 1:10			
Max. gradient for parking ramps 1:15			
Min. ramp widths (refer to Table 1)			
Parking and loading			
Max. gradient across parking area 1:15			
Light vehicle parking area min. height clearance 2.5m			
Loading vehicle parking area min. height clearance 4.5m			
Parking / loading bay dimensions – refer to Town Planning : <i>Minimum Standards for Parking and Loading Facilities to be Provided Within Any Site</i>			



ETHEKWINI TRANSPORT AUTHORITY

30 Archie Gumede Place | Durban | 4001
P O Box 680 | Durban | 4000
Tel: 031 311 7344 | Fax: 031 305 5871
www.durban.gov.za

	YES	NO	N/A
Aisle width adequate for two-way/one-way – refer to Town Planning : <i>Minimum Standards for Parking and Loading Facilities to be Provided Within Any Site</i>			
Vehicle tracking for loading areas			
No. of loading bays – refer to Town Planning : <i>Minimum Standards for Parking and Loading Facilities to be Provided Within Any Site</i>			
No. of light vehicle parking bays relaxed from 4.9m depth to 4.6m only if less than 10% of the total parking			
Parking bay width for light vehicles relaxed to max. 0.1m if isolated parking areas			
Min. one access (ingress and egress) for max. 400 parking bays			
Full frontal access to parking from road not permitted			
Tandem parking bays permitted <u>only</u> if surplus to parking requirements			
Additional/General			
Boundary wall / fence to be shown for all developments (excluding single dwelling house – single unit per site)			
Petrol service station (PSS) frontage min. 36m			
Pump island for PSS min. 5m from site boundary			
PSS clear visibility of min. 120m in both directions at height of 1.37m from point of egress			
PSS not to be sited on a road having gradient at any point within 120m of any point of access to the PSS > 1:7			
Heavy vehicle access control (gate/boom/security control) to be setback based on requirements of ETA Manual for Site Traffic and Traffic Impact Assessments– or waived if building plan endorsed that ‘access to remain open during business operating hours’			
Light vehicle access control (gate/boom/security control) to be setback based on requirements of ETA Manual for Site Traffic and Traffic Impact Assessments - or waived if building plan endorsed that ‘access to remain open during business operating hours’			
Left-in-left out access designed and endorsed on plan			
Accesses to be clearly annotated for type of vehicle use (light/heavy veh. or both)			

Assessed by:.....

Date:.....

Approved / Not Acceptable :

Disclaimer : The above must not be construed to be an exhaustive list of requirements. The Head ETA reserves the right to request additional requirements or to amend the requirements as deemed necessary.



ETHEKWINI TRANSPORT AUTHORITY

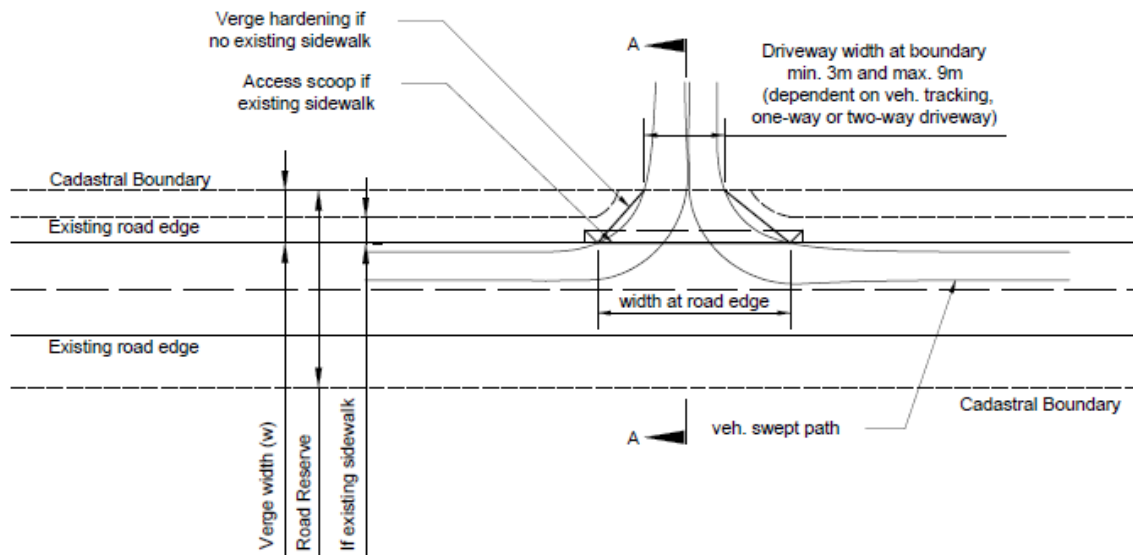
30 Archie Gumede Place | Durban | 4001
P O Box 680 | Durban | 4000
Tel: 031 311 7344 | Fax: 031 305 5871
www.durban.gov.za

Table 1 : Minimum access /driveway/ ramp widths

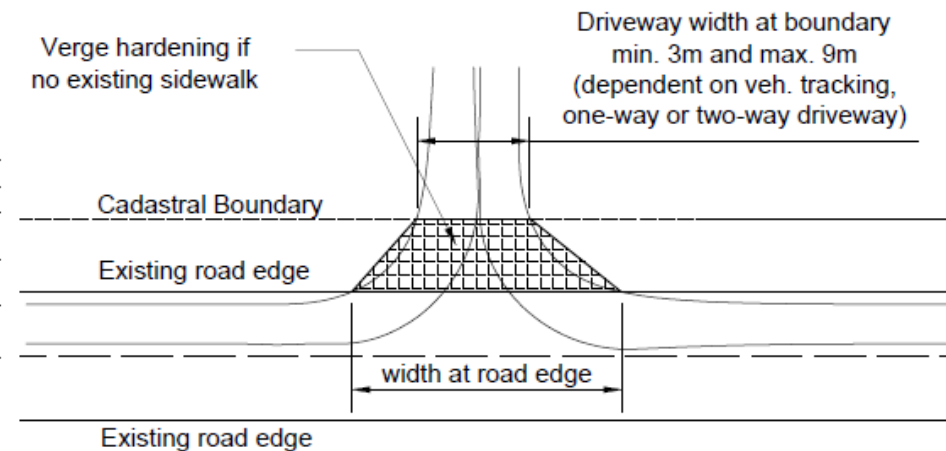
Description	Minimum width (m) ^{1,2}	
	One-way	Two-way
Access / driveway / ramp	3.0	5.5

¹ minimum width to be widened to accommodate turning paths of design vehicles

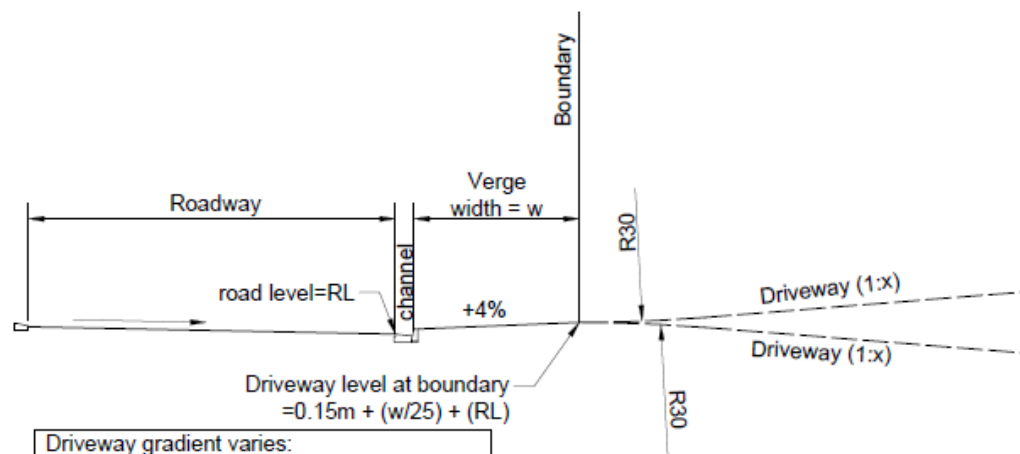
² minimum width to be increased by min. 1.2m to accommodate pedestrians and must include physical separation from vehicles e.g. kerb



TYPICAL DRIVEWAY DETAIL

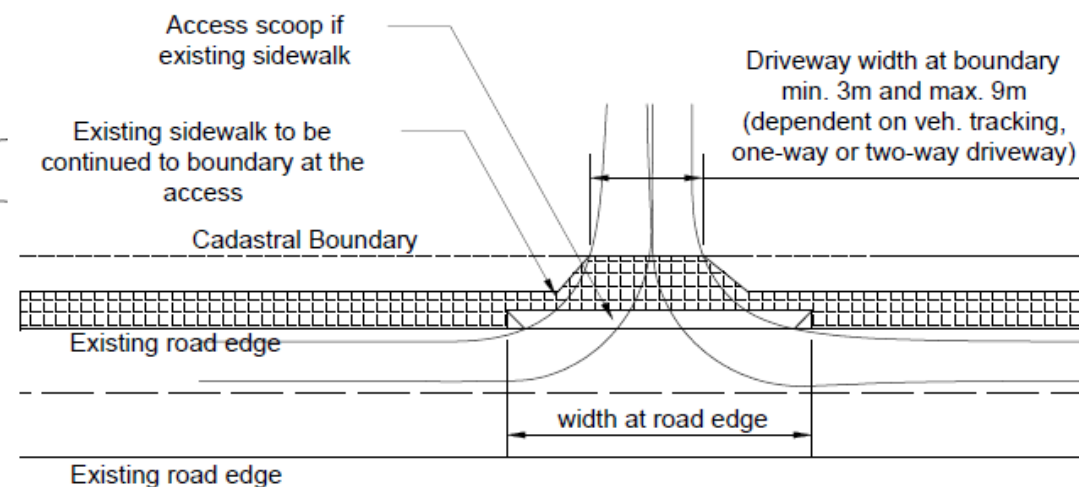


TYPICAL DRIVEWAY DETAIL - NO EXISTING SIDEWALK



- Driveway gradient varies:
1. max. 1:7 for light vehicles
 2. max. 1:8 for light vehicles and pedestrians
 3. max. 1:10 for loading vehicles
 4. max. 1:5 for light vehicles on short section at discretion of ETA

SECTION A-A



TYPICAL DRIVEWAY DETAIL - EXISTING SIDEWALK

ACCESS DETAIL

ANNEXURE D

Traffic Counts and Verification Letter for Traffic Counts



**CONSULTING
ENGINEERS (PTY) LTD**
CIVIL • TRAFFIC • WATER • PROJECT MANAGEMENT

P O Box 949, Westville, 3639

Tel: 082 200 9918

info@nsaengineering.co.za

CK No. 2016/491232/07

06 February 2018

Ethekwini Municipality

Ethekwini Transport Authority

To whom it may concern

Our Ref: NSA 1033-1 – 2018 ERF 2954 Kingsburg

This letter serves to confirm that, NSA Consulting Engineers undertook traffic surveys on Tuesday 30th January 2018, Saturday 03rd February 2018 and Sunday 04th February 2018 at the intersections of:

- Vaughan Goodwin Road and Longacres Drive

Should you require any further information regarding the above, please do not hesitate to contact the undersigned.

Yours faithfully,

NDA Consulting Engineers

Mr. Neeraj Sunker

Pr. Tech Eng

TRAFFIC SURVEY ANALYSIS

CLIENT: NSA CONSULTING ENGINEERS

SITE: INTERSECTION OF LONGACRES DRIVE AND VAUGHAN GOODWIN ROAD

DATE: TUESDAY 30 JANUARY 2018

UNITS: CLASSIFIED

AM PEAK

APPROACH FROM NAME MOVEMENT TIME	SOUTH VAUGHAN GOODWIN ROAD															TOTAL
	LEFT TURN					STRAIGHT					RIGHT TURN					ALL MOVEMENTS
	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	
06:00 - 06:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
06:15 - 06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 - 06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 - 07:00	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	2
07:00 - 07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 - 07:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
07:30 - 07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 - 08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 - 08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 - 08:30	1	0	0	0	1	0	0	0	0	0	2	0	0	0	2	3
08:30 - 08:45	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	2
08:45 - 09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	0	0	0	3	0	0	0	0	0	6	0	0	0	6	9

PM PEAK

APPROACH FROM NAME MOVEMENT TIME	SOUTH VAUGHAN GOODWIN ROAD															TOTAL
	LEFT TURN					STRAIGHT					RIGHT TURN					ALL MOVEMENTS
	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	
15:00 - 15:15	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	16
15:15 - 15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30 - 15:45	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	53
15:45 - 16:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
16:00 - 16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
16:15 - 16:30	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	2
16:30 - 16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45 - 17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00 - 17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15 - 17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30 - 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45 - 18:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
TOTAL	4	0	0	0	4	0	0	0	0	0	4	0	0	0	0	75

TRAFFIC SURVEY ANALYSIS

CLIENT: NSA CONSULTING ENGINEERS

SITE: INTERSECTION OF LONGACRES DRIVE AND VAUGHAN GOODWIN ROAD

DATE: TUESDAY 30 JANUARY 2018

UNITS: CLASSIFIED

AM PEAK

APPROACH FROM NAME MOVEMENT TIME	EAST LONGACRES DRIVE															TOTAL
	LEFT TURN					STRAIGHT					RIGHT TURN					ALL MOVEMENTS
	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	
06:00 - 06:15	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0	4
06:15 - 06:30	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	2
06:30 - 06:45	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	3
06:45 - 07:00	3	0	0	0	3	4	0	0	0	4	0	0	0	0	0	7
07:00 - 07:15	10	0	0	0	10	7	0	0	0	7	0	0	0	0	0	17
07:15 - 07:30	11	0	0	0	11	9	0	0	0	9	0	0	0	0	0	20
07:30 - 07:45	9	0	0	0	9	8	0	0	0	8	0	0	0	0	0	17
07:45 - 08:00	12	0	0	0	12	5	0	0	0	5	0	0	0	0	0	17
08:00 - 08:15	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0	4
08:15 - 08:30	1	0	0	0	1	3	0	0	0	3	0	0	0	0	0	4
08:30 - 08:45	0	0	0	0	0	4	0	0	0	4	0	0	0	0	0	4
08:45 - 09:00	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	2
TOTAL	52	0	0	0	52	49	0	0	0	49	0	0	0	0	0	101

PM PEAK

APPROACH FROM NAME MOVEMENT TIME	EAST LONGACRES DRIVE															TOTAL
	LEFT TURN					STRAIGHT					RIGHT TURN					ALL MOVEMENTS
	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	
15:00 - 15:15	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
15:15 - 15:30	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	3
15:30 - 15:45	2	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2
15:45 - 16:00	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
16:00 - 16:15	1	0	0	0	0	3	0	0	0	3	0	0	0	0	0	3
16:15 - 16:30	0	0	0	0	0	4	0	0	0	4	0	0	0	0	0	4
16:30 - 16:45	0	0	0	0	0	8	0	0	0	8	0	0	0	0	0	8
16:45 - 17:00	1	0	0	0	0	8	0	0	0	8	0	0	0	0	0	8
17:00 - 17:15	0	0	0	0	0	7	0	0	0	7	0	0	0	0	0	7
17:15 - 17:30	1	0	0	0	0	8	0	0	0	8	0	0	0	0	0	8
17:30 - 17:45	1	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2
17:45 - 18:00	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
TOTAL	8	0	0	0	0	48	0	0	0	48	0	0	0	0	0	48

TRAFFIC SURVEY ANALYSIS

CLIENT: NSA CONSULTING ENGINEERS

SITE: INTERSECTION OF LONGACRES DRIVE AND VAUGHAN GOODWIN ROAD

DATE: TUESDAY 30 JANUARY 2018

UNITS: CLASSIFIED

AM PEAK

APPROACH FROM NAME MOVEMENT TIME	WEST LONGACRES DRIVE															TOTAL
	LEFT TURN					STRAIGHT					RIGHT TURN					ALL MOVEMENTS
	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	
06:00 - 06:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
06:15 - 06:30	0	0	0	0	0	2	0	0	0	2	3	0	0	0	3	5
06:30 - 06:45	0	0	0	0	0	1	0	0	0	1	2	0	0	0	2	3
06:45 - 07:00	0	0	0	0	0	3	0	0	0	3	1	0	0	0	1	4
07:00 - 07:15	0	0	0	0	0	9	0	0	0	9	6	0	0	0	6	15
07:15 - 07:30	0	0	0	0	0	12	0	0	0	12	8	0	0	0	8	20
07:30 - 07:45	0	0	0	0	0	8	0	0	0	8	6	0	0	0	6	14
07:45 - 08:00	0	0	0	0	0	9	0	0	0	9	8	0	0	0	8	17
08:00 - 08:15	0	0	0	0	0	2	0	0	0	2	2	0	0	0	2	4
08:15 - 08:30	0	0	0	0	0	3	0	0	0	3	3	0	0	0	3	6
08:30 - 08:45	0	0	0	0	0	2	0	0	0	2	4	0	0	0	4	6
08:45 - 09:00	0	0	0	0	0	1	0	0	0	1	2	0	0	0	2	3
TOTAL	0	0	0	0	0	52	0	0	0	52	46	0	0	0	46	98

PM PEAK

APPROACH FROM NAME MOVEMENT TIME	WEST LONGACRES DRIVE															TOTAL
	LEFT TURN					STRAIGHT					RIGHT TURN					ALL MOVEMENTS
	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	
15:00 - 15:15	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1
15:15 - 15:30	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
15:30 - 15:45	0	0	0	0	0	2	0	0	0	0	1	0	0	0	1	1
15:45 - 16:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
16:00 - 16:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
16:15 - 16:30	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1
16:30 - 16:45	0	0	0	0	0	5	0	0	0	0	1	0	0	0	1	1
16:45 - 17:00	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0
17:00 - 17:15	0	0	0	0	0	6	0	0	0	0	1	0	0	0	1	1
17:15 - 17:30	0	0	0	0	0	7	0	0	0	0	1	0	0	0	1	1
17:30 - 17:45	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
17:45 - 18:00	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1
TOTAL	0	0	0	0	0	34	0	0	0	0	8	0	0	0	8	8