Bayside Council
Serving Our Community

Bayside Planning Panel 1/05/2018

Item No	**5.2**
Subject	**Draft Planning Proposal: 88-96 New Illawarra Road & 307-311A Bexley Road, Bexley North**
Report by	Howard Taylor, Urban Planner
File	F17/333

Summary

Council has received a draft Planning Proposal in relation to land at 88-96 New Illawarra Road & 307-311A Bexley Road, Bexley North (subject site).

The draft Planning Proposal seeks to:

1 Rezone the land from R2 Low Density Residential (R2) to R4 High Density Residential (R4).

2 Increase the maximum height of buildings (HOB) on the land from 8.5 metres to 20.5 metres.

3 Remove the requirement for a minimum lot size on the land.

4 Increase the maximum floor space ratio (FSR) on the land from 0.5:1 to 2:1.

The intended outcome of the draft Planning Proposal is to facilitate the provision of new housing within walking distance of regular public transport and existing shops and services in Bexley North local centre.

Officer Recommendation

That Bayside Planning Panel recommend to Council:

That pursuant to section 3.34 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) the draft Planning Proposal for land known as 88-96 New Illawarra Road & 307-311A Bexley Road, Bexley North be submitted to the Department of Planning & Environment (DPE) for a Gateway determination.

Background

Applicant: Mr Nigel White - Planning Direction.

Owner: Mr Tony Soueid.

Site Description: Lots subject to the draft Planning Proposal are shown in table 1, below:

Table 1: Lots subject to draft Planning Proposal

Lot	*DP*	**Address**	**Current zoning**
35	*663036*	307-309 Bexley Road	R2
1	1045200		
B	388204		
6	508629	311 Bexley Road	R2
5	508629	311A Bexley Road	R2
3	508629	88 New Illawarra Road	R2
4	508629	90 New Illawarra Road	R2
1	400341	94 New Illawarra Road	R2
A	388204	96 New Illawarra Road	R2

The subject site has a total area of approximately 4257 m^2 and is bounded by New Illawarra Road to the west; Bexley Road to the east; Amber Gardens reserve to the north; and by residential development to the south. The site currently contains low density residential development and a petrol station located in the northern portion of the site (refer to aerial photograph at **Figure 1,** below).

Figure 1 – Aerial photograph with subject site outlined in red
(Source: www.maps.six.nsw.gov.au)

Site Context:

The site adjoins the southern extent of the B4 Mixed Use zone of the Bexley North local centre, which contains retail and commercial services in a predominantly single and two storey built form. There are also a number of shop top housing developments up to 5-storeys in height within the centre. It is noted that at the time of preparation of this Planning Proposal assessment, a Development Application lodged by NSW Land & Housing Corporation (LAHC) for a part 3/ part 4-storey residential flat building pursuant to a Site Compatibility Certificate issued by the DPE was under consideration by Council at the adjoining site to the south, No 84 New Illawarra Road, Bexley North.

Bexley North rail station, which is on the Airport & South Line provides regular train services to Sydney Airport and Sydney CBD and is located approximately 250 metres walking distance north of the subject site.

A context map for the site is provided in **Figure 2**, below:

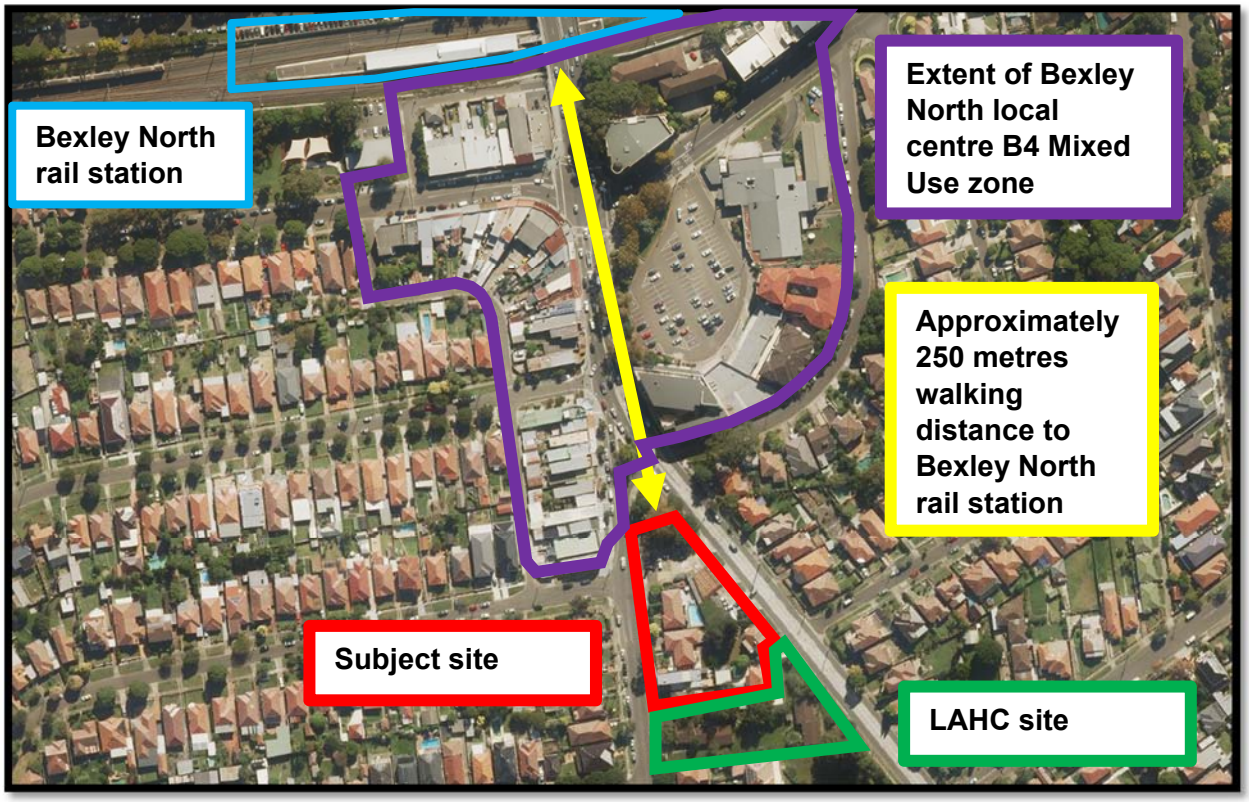


Figure 2: Site context map
(Source: Land & Property Information www.maps.six.nsw.gov.au)

Surrounding land use zones:

Land use zones surrounding the site are predominantly R2 Low Density Residential development to the west, south and east, and B4 Mixed Use associated with the Bexley North local centre, to the north. A pocket park of approximately 475m^2 and zoned RE1 Public Recreation directly adjoins the northern boundary of the site (refer to **Figure 3**, overleaf. Note: subject site outlined in red).

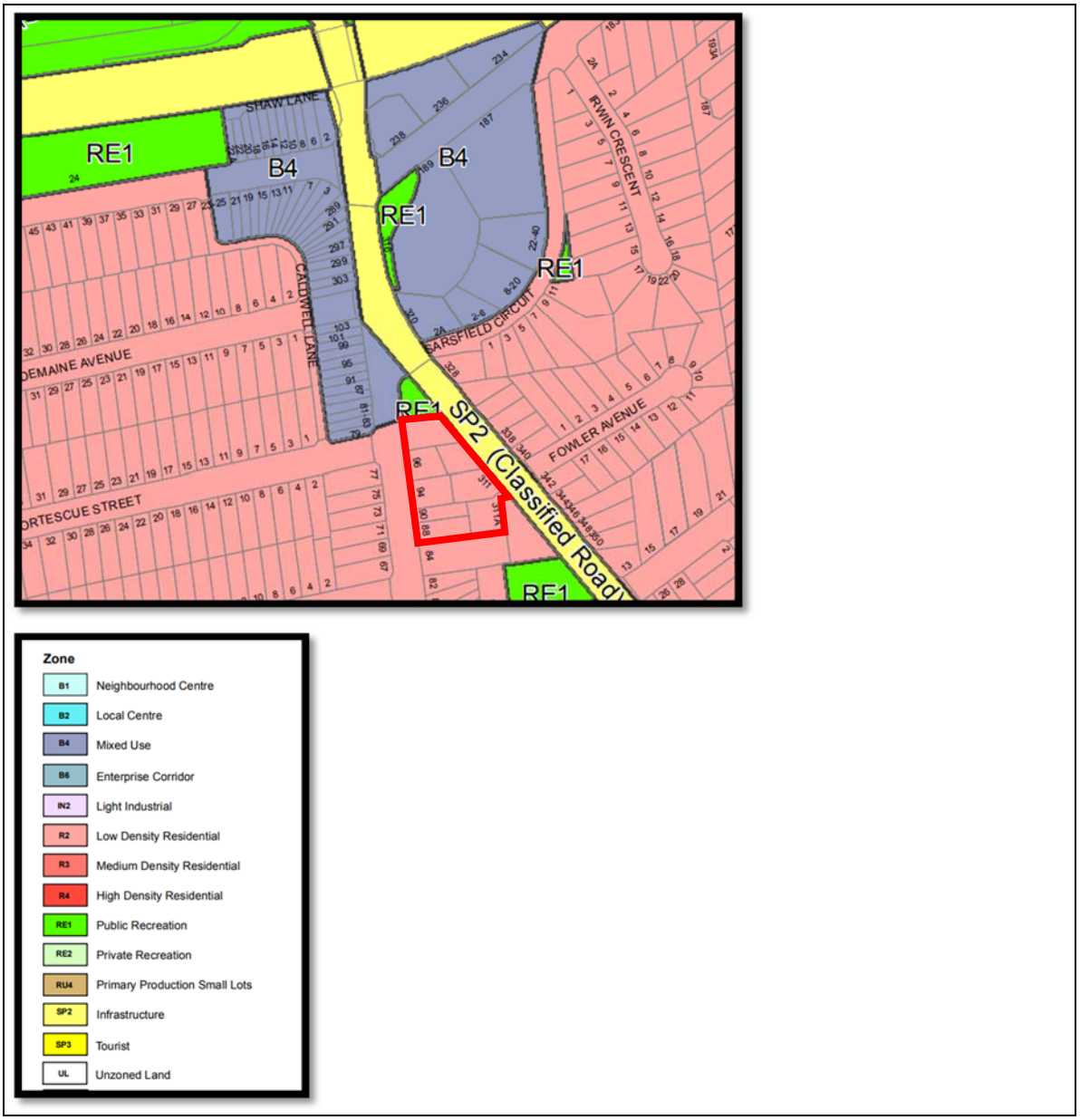


Figure 3 – Rockdale LEP 2011 Land Zoning Map_LZN_001 (Subject site – R2 Low Density Residential) (Source: www.legislation.nsw.gov.au)

Current Planning controls:

The relevant *Rockdale Local Environmental Plan 2011* (Rockdale LEP 2011) extracts (**refer to Figures 4-6,** below) for the subject site and surrounding land are provided below, describing the current planning controls for height of buildings; floor space ratio and minimum lot size (note: subject site outlined in red).

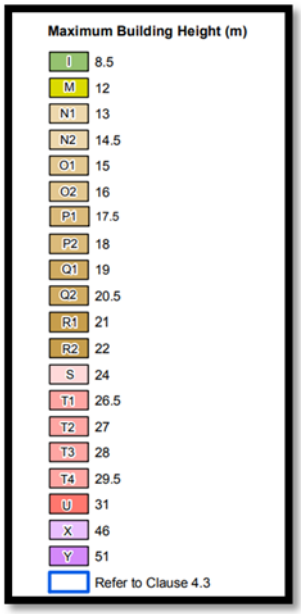


Figure 4 – Rockdale LEP 2011 Height of Buildings Map_HOB_001 (Subject site – 8.5 metres)
(Source: www.legislation.nsw.gov.au)

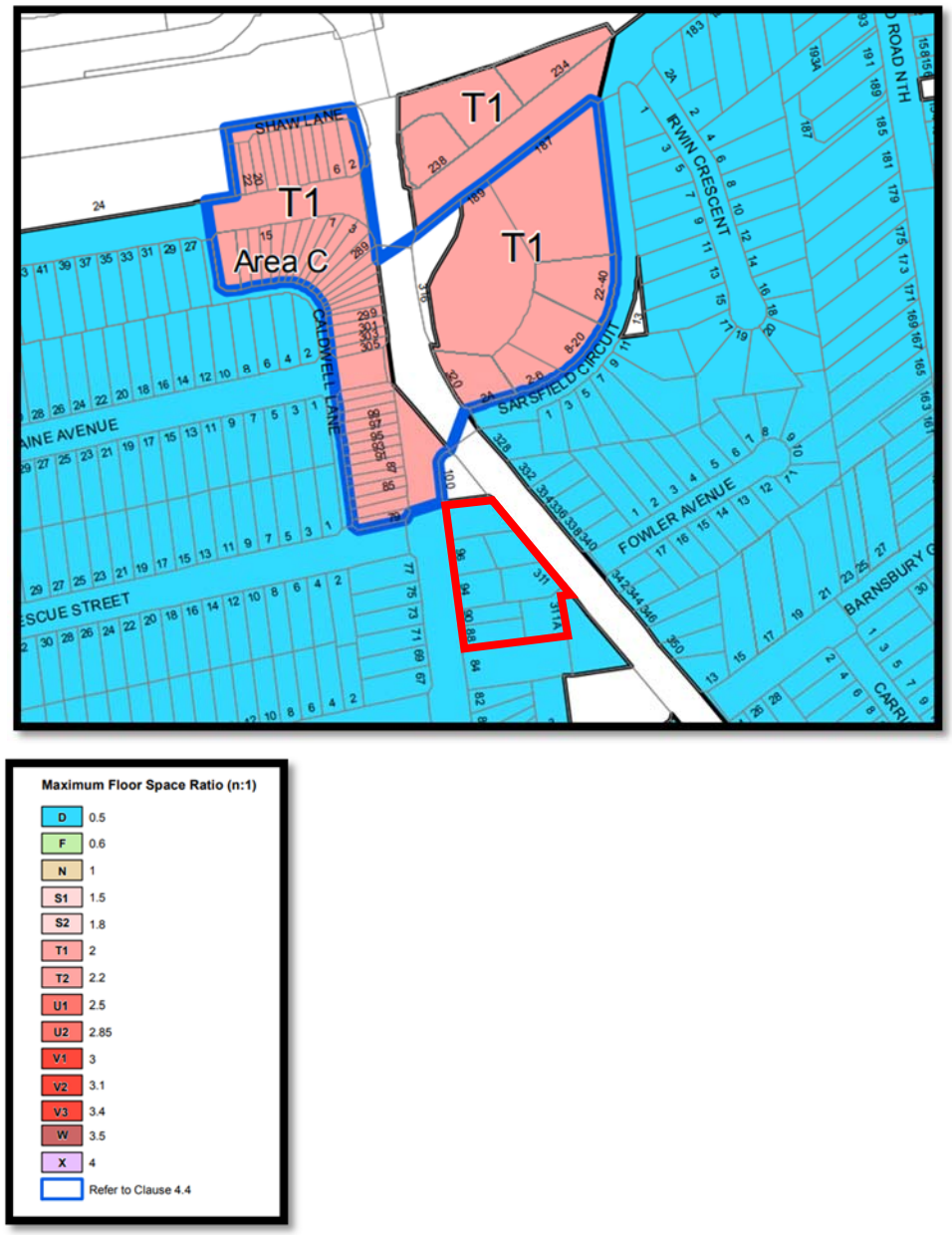


Figure 5 – Rockdale LEP 2011 Floor Space Ratio Map_FSR_001 (Subject site – 0.5:1)
(Source: www.legislation.nsw.gov.au)

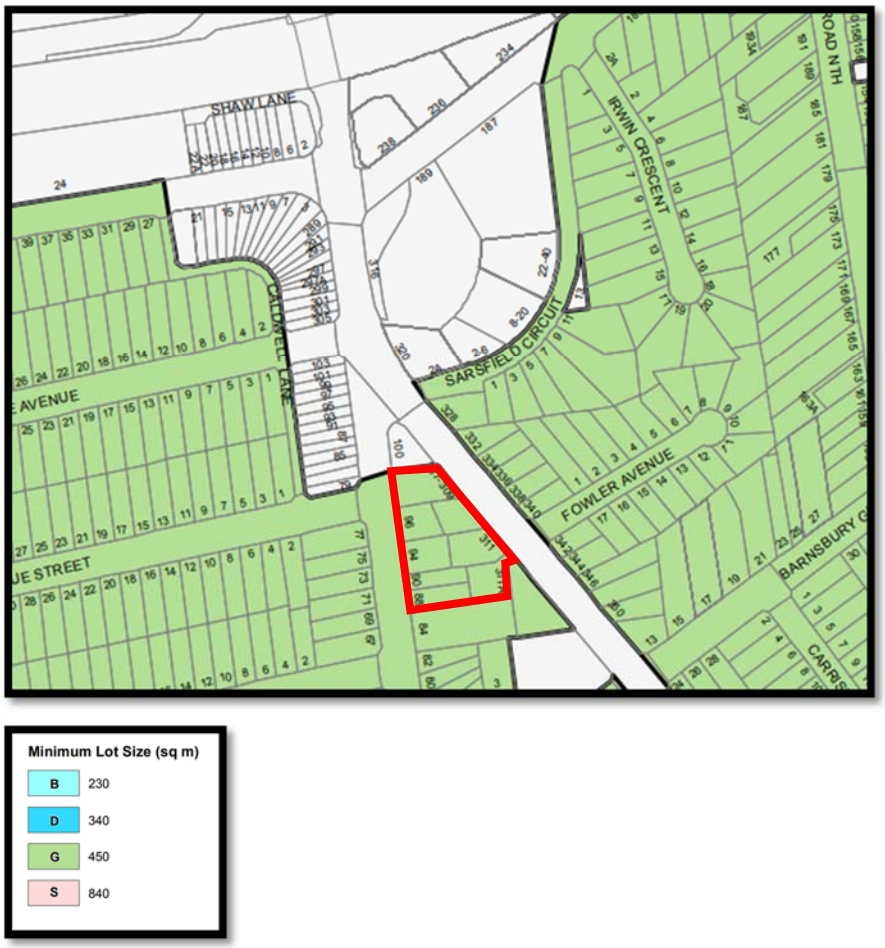


Figure 6 – Rockdale LEP 2011 Lot Size Map_LSZ_001 (Subject site – 450 m^2)
(Source: www.legislation.nsw.gov.au)

Draft Planning Proposal Assessment

Summary of Draft Planning Proposal

In summary, the draft Planning Proposal seeks to amend the following provisions in the Rockdale LEP 2011 as follows:

1 Rezone the land from R2 Low Density Residential (R2) to R4 High Density Residential (R4).

2 Increase the maximum height of buildings (HOB) on the land from 8.5 metres to 20.5 metres.

3 Increase the maximum floor space ratio (FSR) on the land from 0.5:1 to 2:1.

4 Remove the requirement for a minimum lot size on the land.

A copy of the draft Planning Proposal is included at ***Attachment 1.***

A comparison of the current and proposed zoning and development standards for the site, based on the provisions of the Rockdale LEP 2011, is provided in **Table 2**, below:

Table 2: Comparison of current and proposed zoning & development standards

Development Standard	Current	Proposed
Zoning	R2 Low Density Residential	R4 High Density Residential
Height of Building	8.5 metres	20.5 metres
Floor Space Ratio	0.5:1	2:1
Minimum Lot Size	450 m^2	nil

Assessment of Draft Provisions

Proposed Zoning

The proposed R4 High Density Residential zoning is intended to facilitate high density residential development within an existing residential context located in close proximity to a local centre and rail station.

Proposed Height of Buildings

The proposed application for a height limit of 20.5 metres is considered to be appropriate given the size of the site, being approximately 4257 sqm. For buildings located on sites within the area marked ‘Area C’ on the Rockdale LEP 2011 Height of Buildings Map that have an area greater than 1200 sqm, the maximum height is increased to 22 metres. The relationship of the site to Area C is shown in **Figure 4,** above.

The draft Planning Proposal was supported by an Urban Context Report (UCR), which demonstrates that the proposed maximum building height is considered appropriate. Extracts from the UCR are provided in **Figures 7, 8, 9 and 10** below and illustrate the proposed height/ massing in the context of adjoining development. The UCR was submitted to Council's Urban Designer, who raised no objection to the proposed building height.

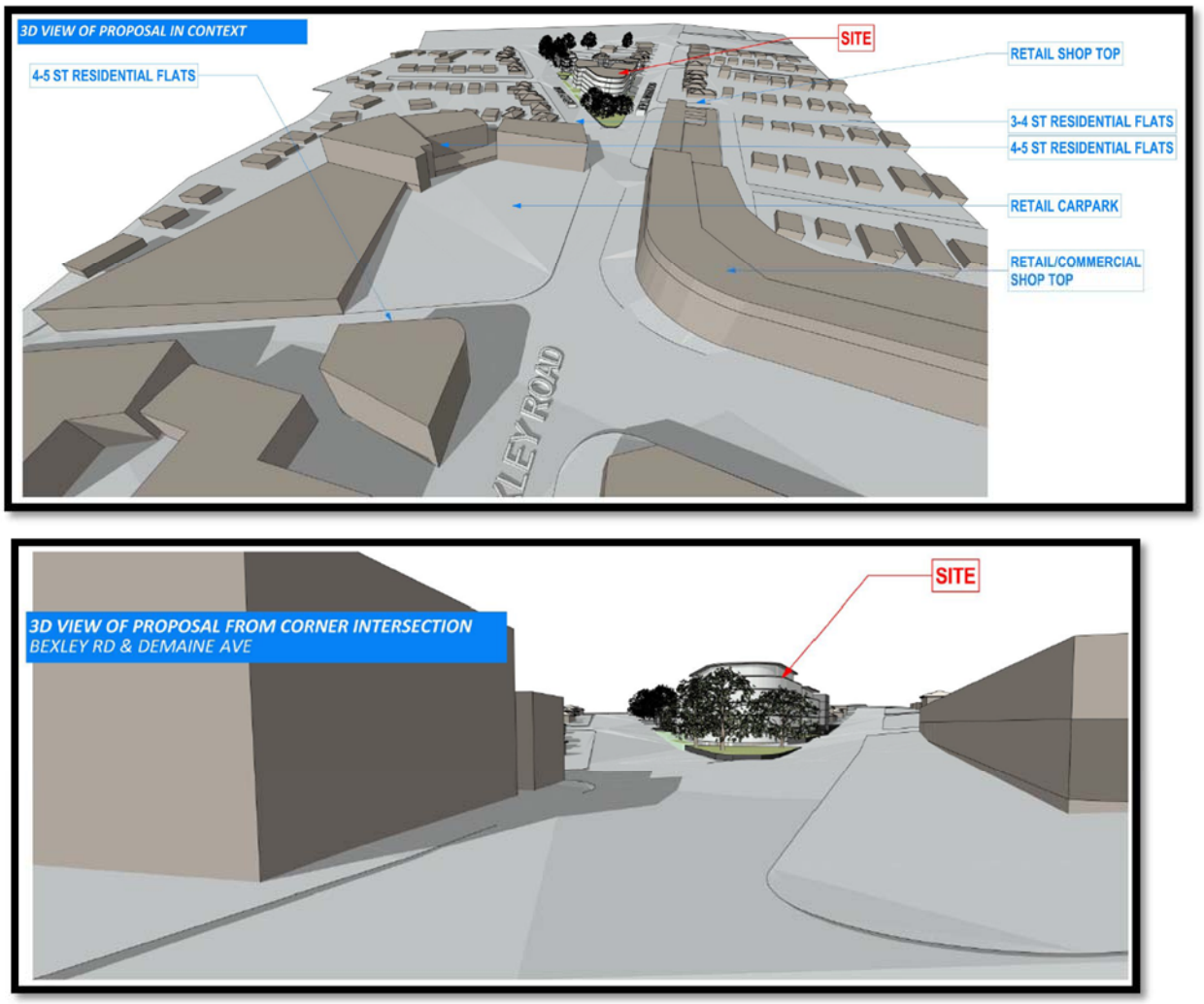


Figure 7: 3D Views of Planning Proposal
(Source: Proponent's Planning Proposal)

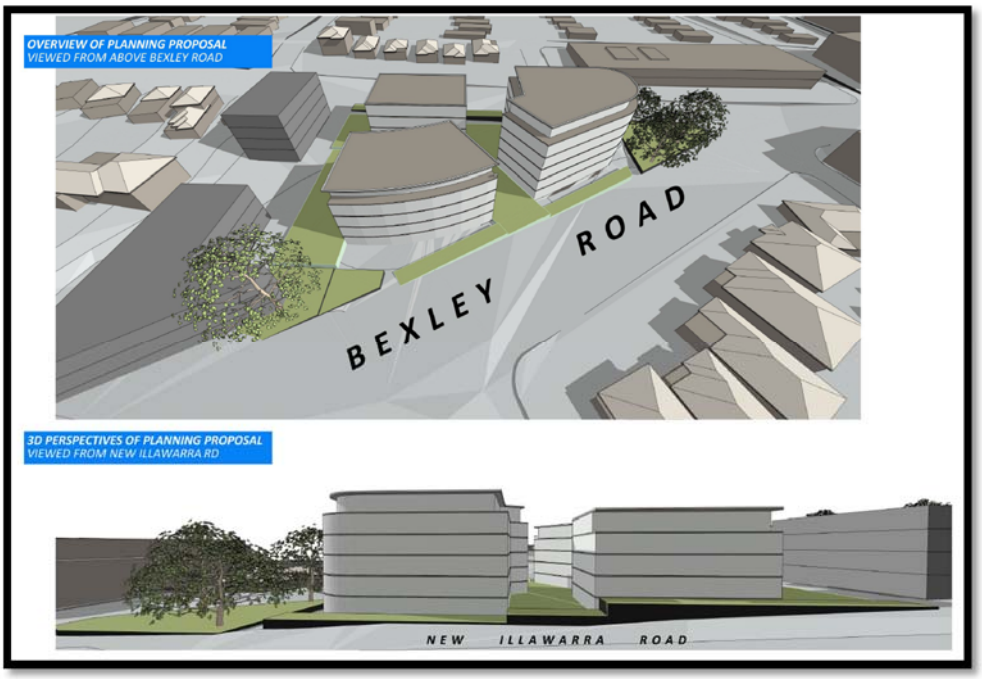


Figure 8: 3D Perspectives of Planning Proposal
(Source: Proponents Urban Context Report)

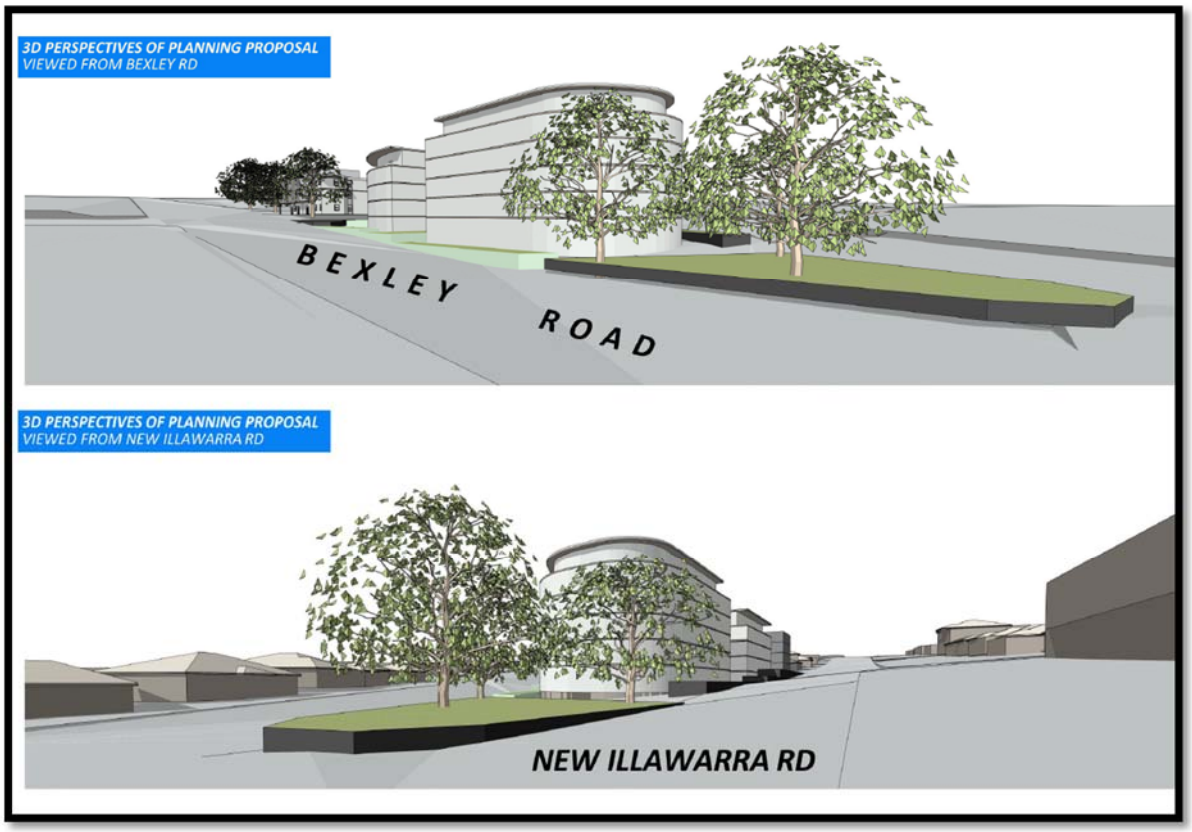


Figure 9: 3D Perspectives from Bexley Road and New Illawarra Road
(Source: Proponents Urban Context Report)

A recent example of 4-5 storey development in the Bexley North local centre can be found at No 502/ 2A Sarsfield Circuit (**Figure 10**, overleaf):

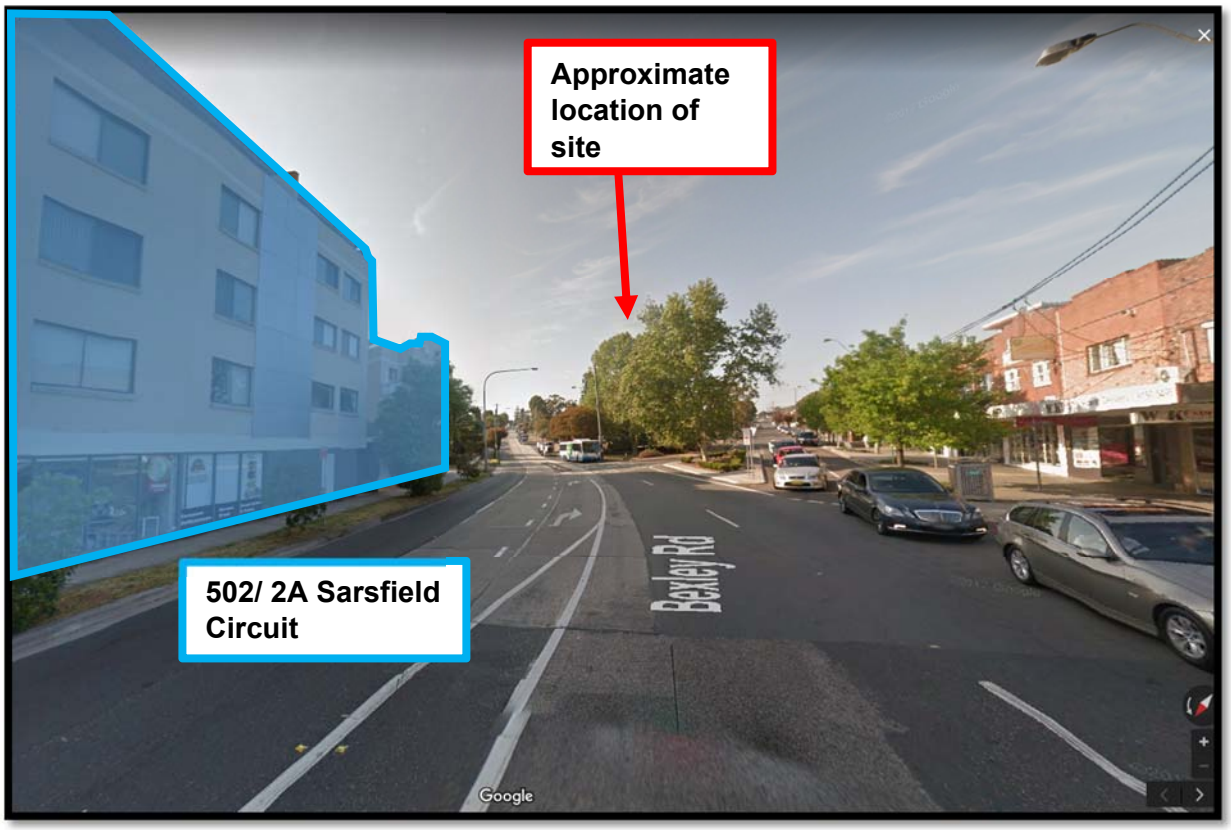


Figure 10: Existing 4-5 storey development at 502/ 2A Sarsfield Circuit, Bexley North (Source: www.google.com.au)

The site to the south at No 84 New Illawarra Road is owned by NSW Land & Housing Corporation (LAHC). LAHC were issued with a Site Compatibility Certificate (SCC) under *State Environmental Planning Policy (Affordable Rental Housing) 2009* (ARH SEPP) by determination issued by the DPE on 29 April 2016. The 'requirements imposed on determination' require that the development satisfy the following requirements:

1. *The height of the proposed building fronting New Illawarra Road should be limited to 2 storeys, and may transition to 3 storeys at the rear, to reflect the predominantly 2 storey streetscape and utilising the natural contours of the site.*

2. *The height of the proposed building fronting Bexley Road should be limited to 3 storeys, and may transition to 4 storeys with appropriate setbacks at the rear, to reflect a predominantly 3 storey streetscape and scale.*

3. *Final dwelling numbers and parking spaces are to the satisfaction of the consent authority in determining the development application.*

4. *The final built form will be subject to the consent authority undertaking a detailed assessment of the proposal's building design and height, and its impact on solar access and overshadowing and the amenity of surrounding residential development as part of the development application process.*

A Development Application (DA-2017/371) was subsequently lodged with Council for the construction of a part-two and part-three storey residential flat building comprising 10 residential units fronting New Illawarra Road; and a part-three and part-four storey residential flat building comprising 14 residential units fronting Bexley Road, including basement carpark. Street elevations submitted as part of the DA are shown in **Figure 11**, below:

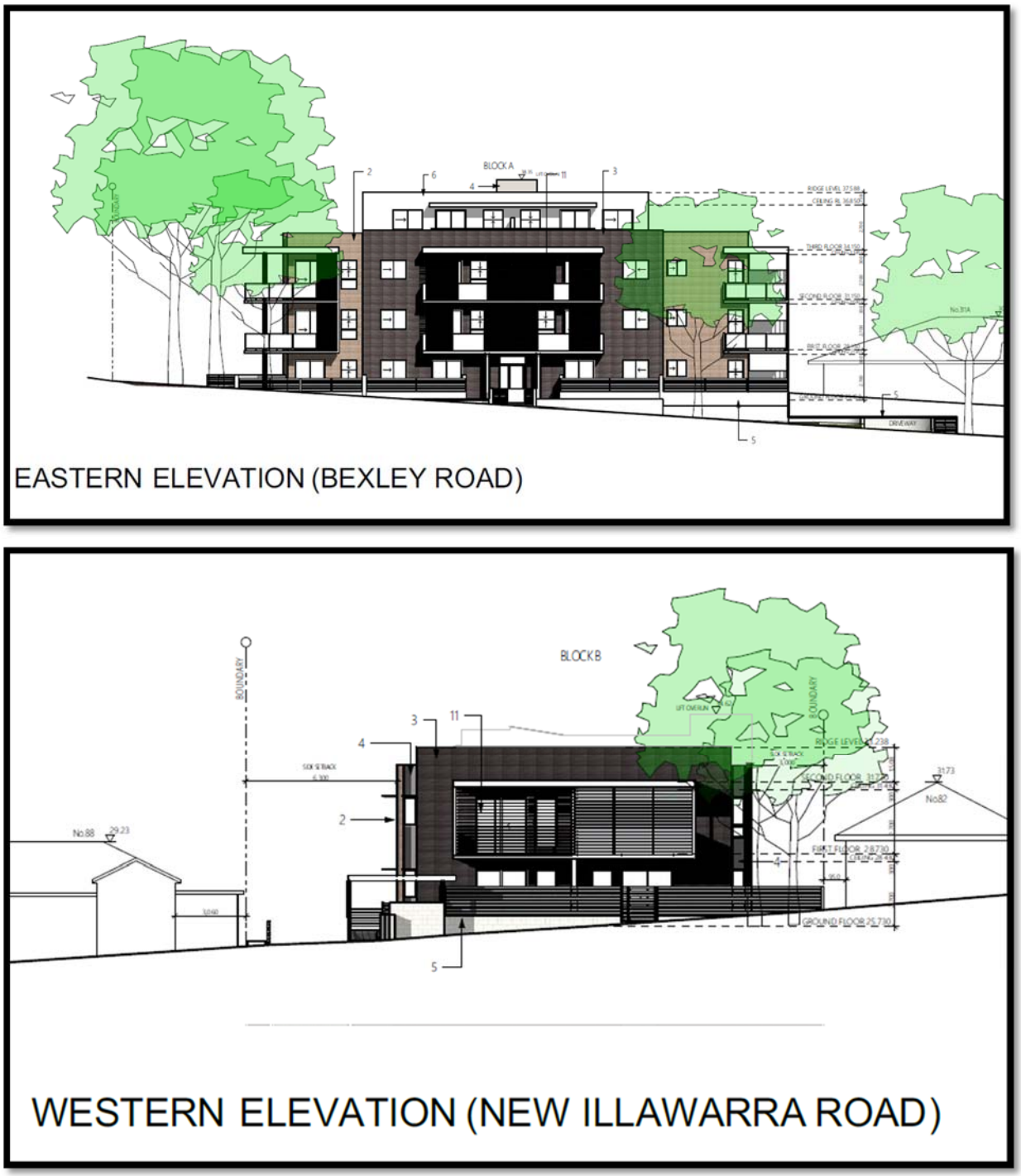


Figure 11: DA-2017/371 – Elevations of 84 New Illawarra Road, Bexley North

The DA is currently under assessment and is yet to be determined at the time of preparation of this assessment. The draft Planning Proposal for 88-96 New Illawarra Road and 307-311A Bexley Road has been considered in the context of the proposed development by LAHC.

Proposed Floor Space Ratio

The proposed application of a FSR of 2:1 for the land is considered appropriate, given the existing FSR of 2:1 (plus an additional 0.5:1 FSR for sites greater than 1200 m^2 in area)

applying to adjoining B4 Mixed Use zoned land to the north of the subject site; and the scale of the development at No 84 New Illawarra Road.

Proposed Minimum Lot Size

The proposed application to delete the minimum lot size provisions is considered appropriate, as the retention of a minimum lot size would have the effect of constraining development potential for the proposed R4 High Density Residential zoned land.

Urban Context & Evaluation

An Urban Context Report (UCR) has been submitted with the draft Planning Proposal (refer to ***Attachment 2***). The UCR provides maximum development envelopes illustrated by mass modelling diagrams for both existing and potential built form on surrounding B4 Mixed Use and R2 Low Density Residential zoned land. The UCR was referred to Council's Urban Designer for assessment.

The proposed building height and FSR controls are considered consistent with the heights achievable on B4 Mixed Use zoned land to the north, and are not considered to result in development of excessive bulk or scale for the sites location, being within 400 metres walking distance of regular public transport and existing shops and services in Bexley North local centre.

Should Council and the DPE support the draft Planning Proposal, any proposed Development Application(s) (DA) would need to be supported by a further detailed urban design analysis, to illustrate the intended built form outcome proposed for the subject land at that time.

Justification

Environmental Planning & Assessment Act 1979 (EP&A Act)

The NSW Department of Planning & Environment's *A Guide to Preparing Planning Proposals* - issued under s3.33 (3) of the EP&A Act - provides guidance and information on the process for preparing Planning Proposals. The assessment of the submitted Planning Proposal by Council staff has been undertaken in accordance with the latest version of this *Guide* (dated August 2016).

Section 9.1 Ministerial Directions (formerly known as 'section 117 directions')

Section 9.1 Ministerial directions (s9.1 directions) set out what a RPA must do if a s9.1 direction applies to a Planning Proposal, and provides details on how inconsistencies with the terms of a direction *may* be justified.

An assessment of the Planning Proposal against the applicable s9.1 directions is provided in **Table 3** below:

Table 3: Planning Proposal consistency with s9.1 directions.

Direction	Planning Proposal consistency with terms of direction	Consistent: Yes/ No (If No, is the inconsistency adequately justified?)
2.3 Heritage Conservation	**What a RPA must do:** A RPA must ensure that a Planning Proposal contains provisions that facilitate the conservation of heritage items, places, building works or precincts of environmental heritage significance to an area. Comment: The site is not within a conservation area, does not contain a heritage item and is not in the vicinity of a heritage item. No inconsistencies with the terms of the direction were identified.	**YES**
3.1 Residential Zones	**What a RPA must do:** The RPA must include in the Planning Proposal the following (relevant) provisions: - encourage the provision of housing that will broaden the choice of building types and locations available in the housing market, and; - make more efficient use of existing infrastructure and services, and - be of good design. Comment: The Planning Proposal proposes to increase the supply of housing, in a residential flat building typology; and will make efficient use of existing infrastructure and services given the sites location within 400 metres walking distance of the Bexley North rail station and Bexley North local centre. In relation to design, the Planning Proposal and accompanying Urban Context Report (refer ***Attachment 2***) were referred to Council's Urban Design officer, who did not raise concern in relation to the proposal from an urban design perspective. The built form resulting from the amended height and FSR are not considered to result in unreasonable overshadowing, privacy or streetscape impacts. In addition, should the Planning Proposal proceed, the design of any proposal will need to address the requirements of *State Environmental Planning Policy No 65--Design Quality of Residential Apartment Development* at the Development Application (DA) stage. No inconsistencies with the terms of the direction were identified.	**YES**
3.3 Home Occupations	**What a RPA must do:** A Planning Proposal must permit home occupations to be carried out in dwelling houses without the need for development consent. Comment:	**YES**

Direction	Planning Proposal consistency with terms of direction	Consistent: Yes/ No (If No, is the inconsistency adequately justified?)
	The proposed R4 High Density Residential zone in the Rockdale LEP 2011 includes home occupations as development that may be carried out in dwelling houses without consent as a permissible use. The Planning Proposal does not seek to alter this provision. No inconsistencies with the terms of the direction were identified.	
3.4 Integrating Land Use and Transport	**What a RPA must do:** A Planning Proposal must locate zones for urban purposes and include provisions that give effect to and are consistent with the aims, objectives and principles of *Improving Transport Choice – Guidelines for planning and development (DUAP 2001)* (guidelines). Comment: The Planning Proposal is considered consistent with the guidelines as the Planning Proposal encourages higher density residential and development in close proximity to frequent public transport and a mix of uses including shops and services. No inconsistencies with the terms of the direction were identified.	**YES**
3.5 Development Near Licensed Aerodromes	**What a RPA must do:** In the preparation of a Planning Proposal, a RPA must: - consult with the Department of the Commonwealth responsible for aerodromes and the lessee of the aerodrome. Comment: Consultation with the Commonwealth Department of Infrastructure and Regional Development (DIRD) will be undertaken should the DPE determine to issue a Gateway Determination. - take into consideration the Obstacle Limitation Surface (OLS) and prepare appropriate development standards such as height where the land is affected by the OLS. Comment: The submitted survey indicates that the site has a high point of approximately 26 metres Australian Height Datum (AHD). The amendment to the building height map proposes a maximum building height of 20.5 metres, resulting in a potential maximum building height of approximately 46.5 metres AHD, considerably below the prescribed OLS of 70 to 80 metres AHD in the vicinity of the site. - obtain permission from the Department of the Commonwealth where the height encroaches the OLS prior to undertaking community consultation Comment: The site is located between the 70m and 80m AHD OLS contours as shown on the Prescribed Airspace for Sydney Airport Obstacle Limitation Surface declared by the Commonwealth Department of Infrastructure and Regional Development map dated 20 March 2015.	**YES**

Direction	Planning Proposal consistency with terms of direction	Consistent: Yes/ No (If No, is the inconsistency adequately justified?)
	The submitted survey indicates that the site has a high point of approximately 26 metres AHD. The proposed maximum building height is 20.5 metres. Accordingly, the potential built form will not penetrate the OLS and therefore, permission from DIRD prior to community consultation will not be required. No inconsistencies with the terms of the direction were identified.	
4.1 Acid Sulfate Soils	**What a RPA must do:** The direction requires that a RPA must consider an acid sulfate soils study assessing the appropriateness of the change of land use given the presence of acid sulfate soils. Comment: The Rockdale LEP 2011 Acid Sulfate Soils Map identifies the site as having Class 5 acid sulfate soils. **Consistency** *A Planning Proposal may be inconsistent with the terms of the direction if the inconsistency is justified by a study prepared in support of the Planning Proposal.* Comment: Clause 6.1 of the Rockdale LEP 2011 requires an acid sulfate soils management plan at DA stage, before carrying out any development on the land. The inconsistency with this direction is therefore considered minor and justifiable.	**NO - Inconsistency justified.**
4.3 Flood Prone Land	**What a RPA must do:** A Planning Proposal must: (4) Include provisions that give effect to and are consistent with the NSW Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005. Comment: The proponent has not submitted a floodplain risk management plan prepared in accordance with the principles and guidelines of the *Flood Plain Development Manual 2005*, or specifically addressed the NSW Flood Prone Land Policy to support the Planning Proposal. However, Council's Strategic Flood Engineer did not raise objection to the proposed method of stormwater modelling, noting that any future DA would require a comprehensive flood assessment. (6) Not contain provisions that apply to the flood planning areas which: (a) permit development in floodway areas, Comment: Flood certificate FA-2016/132 dated 19 May 2016 issued by the former Rockdale City Council identifies the site as being located in a 'Floodway:High Hazard'. The Stormwater	**NO - Inconsistency justified.**

Direction	Planning Proposal consistency with terms of direction	Consistent: Yes/ No (If No, is the inconsistency adequately justified?)
	Drainage Flood Assessment Report submitted with the Planning Proposal was referred to Council's Engineer, who raised no objection to the Planning Proposal given the proposed method of stormwater modelling, and that any future DA would need a comprehensive flood assessment. (b) permit development that will result in significant flood impacts to other properties, Comment: Council's Engineer raised no objection to the proposal given the proposed method of stormwater modelling. (c) permit a significant increase in the development of that land, Comment: A significant increase of development is proposed, however, as noted elsewhere, Council's Strategic Stormwater Engineer raised no objection given the proposed method of stormwater modelling. (d) are likely to result in a substantially increased requirement for government spending on flood mitigation measures, infrastructure or services. Comment Works to Council's drainage infrastructure will be required within the site at the proponents cost. **Consistency:** *A Planning Proposal may be inconsistent with the direction if the RPA can satisfy the Director-General that:* *(a) the Planning Proposal is in accordance with a floodplain risk management plan prepared in accordance with the principles and guidelines of the Floodplain Development Manual 2005, or* Comment: No objection was raised to rezoning the land to R4 High Density Residential, however, if Council and the DPE support the draft Planning Proposal, any proposed Development Application(s) would need to be supported by a flood assessment, including: (i) a floodplain risk management plan prepared in accordance with the principles and guidelines of the Floodplain Development Manual 2005; and (ii) a full hydraulic (pipe) capacity assessment to support any future pipe realignment.	

Direction	Planning Proposal consistency with terms of direction	Consistent: Yes/ No (If No, is the inconsistency adequately justified?)
	(b) the provisions of the Planning Proposal that are inconsistent are of minor significance. Comment: The inconsistency with the direction is not considered of minor significance given that the Planning Proposal significantly increases residential density on an identified floodway.	
5.10 Implementation of Regional Plans	**What a RPA must do:** Planning proposals must be consistent with a Regional Plan released by the Minister for Planning. Comment: *A Metropolis of Three Cities* is the Region Plan that applies to the five districts that make up the Greater Sydney Region. The Planning Proposal is consistent with the following objectives in the Region Plan: • Objective 10: Greater housing supply The Planning Proposal increases the supply of housing. • Objective 14: integrated land use and transport creates walkable and 30-minute cities. The Planning Proposal increases housing within a walkable catchment of Bexley North rail station.	**YES**
7.1 Implementation of A Plan for Growing Sydney	**What a RPA must do:** A RPA must ensure that a Planning Proposal is consistent with A Plan for Growing Sydney. Comment: The draft Planning Proposal is consistent with the following directions and priorities contained in A Plan for Growing Sydney: • Direction 2.1: Accelerate housing supply across Sydney. The delivery of new housing must be accelerated to meet the need for a bigger population and to satisfy a growing demand of different types of housing. • Direction 2.2: Accelerate urban renewal across Sydney – providing homes closer to jobs. New urban renewal locations will be selected in or near centres on the public transport network. Locating new housing here will make it easier for people to get to jobs and services and take pressure off congested roads. • Direction 2.3: Improve housing choice to suit different needs and lifestyles. • Direction 3.1: Revitalise existing suburbs. Provision of new housing within Sydney's established suburbs bring real benefits to communities and make good social and economic	**YES**

Direction	Planning Proposal consistency with terms of direction	Consistent: Yes/ No (If No, is the inconsistency adequately justified?)
	sense. Directing new housing to the existing urban areas will reduce the impact of development on the environment and protect productive rural land on the urban fringe. No inconsistencies with the terms of the direction were identified.	

- **State Environmental Planning Policies (SEPPs)**

An assessment of the Planning Proposal against the relevant SEPPs is provided in **Table 4**, below.

Table 4: Relevant SEPPs

Name of SEPP	Compliance of Planning Proposal with SEPP	Complies Y/ N
SEPP No 65—Design Quality of Residential Apartment Development (SEPP 65)	The Planning Proposal was referred to Council's Urban Designer, who raised no objection to the proposal in terms of its consistency with SEPP 65, noting that any future DA, if the Planning Proposal be supported, would be required to comply with SEPP 65 and accompanying Apartment Design Guide.	**YES**
SEPP (Infrastructure) 2007	**Clause 101 – Development with frontage to classified road** The submitted Traffic and Parking Assessment Report was referred to a Traffic Consultant for review. The review found that traffic movements would be significantly less than the current situation and raised no objection to the proposal. Should Council and the DPE support the Planning Proposal, any future DA will be referred to Transport for NSW given the location of the bus stop on New Illawarra Road; and Roads & Maritime Services (RMS) given that the site has frontage to a classified road. **Clause 102 – Impact of road noise or vibration on non-road development** The site is located on Bexley Road, a classified road (Class: Main Road) with an Annual Average Daily Traffic Volume (AADT) in 2017 of 34,786 (RMS Traffic Volume Viewer – Station ID 24221 located approximately 600 metres north of the subject site on Bexley Road). Should Council and the Department of Planning & Environment support the Planning Proposal, any future DA will require consideration of the publication *'Development Near Rail Corridors and Busy Roads – Interim Guideline.'* (Department of Planning, 2008).	**YES**
SEPP No 55—Remediation of Land	**Clause 6 - Contamination and remediation to be considered in zoning or rezoning proposal** (1) In preparing an environmental planning instrument, a planning authority is not to include in a particular zone (within the meaning of the instrument) any land specified in subclause (4) if the inclusion of the land in that zone would permit a change of use of the land, unless:	**YES**

Name of SEPP	Compliance of Planning Proposal with SEPP	Complies Y/ N
	(a) the planning authority has considered whether the land is contaminated, and (b) if the land is contaminated, the planning authority is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for all the purposes for which land in the zone concerned is permitted to be used, and (c) if the land requires remediation to be made suitable for any purpose for which land in that zone is permitted to be used, the planning authority is satisfied that the land will be so remediated before the land is used for that purpose. Comment: A portion of the site currently contains an operational service station that has existed on the site since the 1960's. In this regard, the Planning Proposal is supported by a Stage 1 Preliminary Environmental Site Assessment; a Stage 1 and 2 Environmental Site Assessment; and a Remedial Action Plan (refer to ***Attachment 3***). The documents were referred to Council's Environmental Scientist, who provided the following comment: *'Following a request to update the report to reflect complete residential use as required in the previous memo dated 25 October 2017, an amended Stage 1 and 2 Environmental Site Assessment was provided:* 1. *'Stage 1 and 2 Environmental Site Assessment – 307-311 Bexley Road and 88-96 New Illawarra Road, Bexley North NSW' (Report ID E16016BN-R03F – Rev 0.2) dated 1 November 2017completed by Geo-Environmental Engineering.* *This reflects the appropriate residential use and states that the site can be made suitable subject to remediation to the site through an RAP. Further review of the site and an RAP can be completed at the DA lodgement stage and reflect the proposed design. Should the site be continued for use as a service station then additional analysis will be required at that time to reflect any changes in site conditions.* *I have no objections to the rezoning of the site to residential use with limited access to soil.'* Based on the above, the site is suitable for rezoning to residential purposes.	

There are no other SEPPs applicable to the Planning Proposal.

- **Sydney Regional Environmental Plans (SREPs)**

There are no SREPs applicable to the Planning Proposal.

- **Strategic Planning Framework**

Regional, sub-regional and district plans and strategies include outcomes and specific actions for a range of different matters including housing and employment targets, and

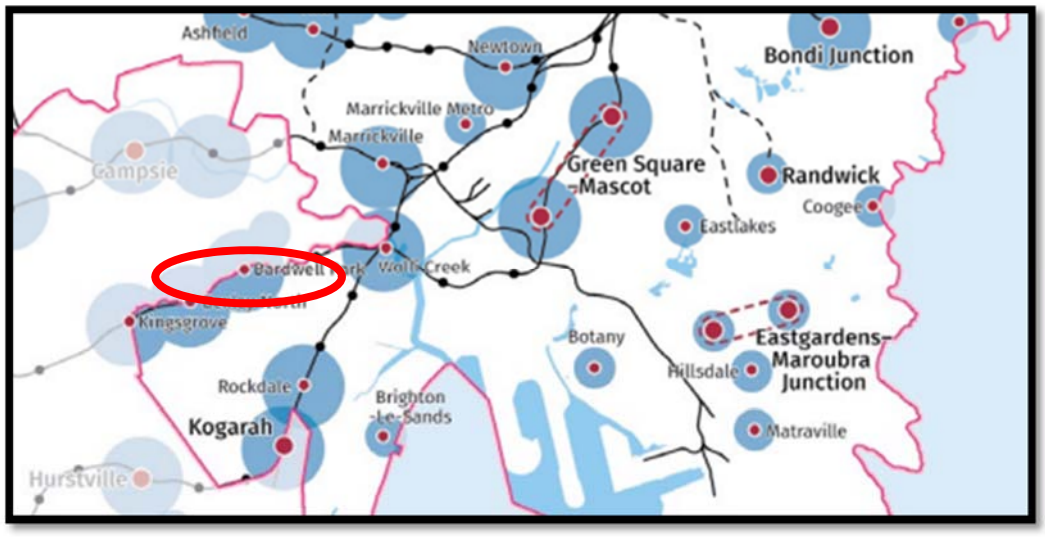
identify regionally important natural resources, transport networks and social infrastructure.

An assessment of the Planning Proposals consistency with the strategic planning framework is provided in **Table 5**, below.

Table 5: Strategic Planning Framework

Name of Strategic Plan	Directions, priorities, objectives and actions	Planning Proposal consistency with Strategic Plan	Consistency Y/ N
Regional Plans			
Greater Sydney Region Plan	Objective 10 – Greater housing supply, which encourages the supply of housing in the right locations with access to shops, services and public transport. Objective 14 – A Metropolis of Three Cities – integrated land use and transport creates walkable and 30-minute cities. *"One of the principal elements in achieving the productivity outcomes is:* *Co-locate activities in metropolitan, strategic and local centres and attract housing in and around centres to create walkable, cycle-friendly neighbourhoods.'*	Comment: The draft Planning Proposal is consistent with objective 10, as additional housing supply is facilitated within walking distance of shops, services and public transport. Comment: The Planning Proposal in located in a local centre and will facilitate additional housing within walking distance of shops and public transport.	**YES**
District Plans			
Eastern City District Plan (ECDP)	• Planning Priority E5: Providing housing supply, choice and affordability, with access to jobs, services and public transport. • Planning Priority E6: Creating and renewing great places and local centres. The Planning Priority establishes	Comment: The Planning Proposal supports the role of the Bexley North local centre by increasing housing provisions within a catchment area within walking distance (up to 10 minutes) of a centre with rail services. Comment: Bexley North is identified as a local centre in the ECDP	**YES**

Name of Strategic Plan	Directions, priorities, objectives and actions	Planning Proposal consistency with Strategic Plan	Consistency Y/ N
	'Principles for local centres' and states that: *"additional residential development within a five-minute walk of a centre focused on local transport, …. will help to create walkable local centres. However, housing should not compromise a centre's primary role to provide goods and services, and the opportunity for the centre's employment function to grow and change over time."*	(refer to the extract from the ECDP in **figure 12**, below). The Planning Proposal is broadly consistent with the 'Principles for local centres' (p49 of the ECDP) through the provision of increased residential development in, or within walkable distance of, the centre. Further, the Planning Proposal does not encroach on the B4 Mixed Use zone to the north and is therefore considered consistent with the principle to protect employment opportunities and retail/ commercial floor space.	



The map illustrates the approximate five-minute walking catchment around local centres serviced by local transport and the approximate 10-minute walking catchment around a centre focused on a mass transit stop. Actual walking catchments of 5-10 minutes will depend on local connections and conditions and should be determined using a place-based approach within which housing, retail and commercial growth opportunities need to be balanced and planned for by councils.

Figure 12: Eastern City District – centres

(Source: Eastern City District Plan)

Name of Strategic Plan	Directions, priorities, objectives and actions	Planning Proposal consistency with Strategic Plan	Consistency Y/ N
	Implementation: *Successful implementation of the district plans requires:* • *councils to prepare and implement local strategic planning statements as part of their strategic planning framework* • *councils to update local environmental plans through the development of their local strategic planning statements and other relevant plans and policies* Role of district and local plans *Region and district plans inform the preparation and endorsement of local strategic planning statements and the preparation and assessment of planning proposals. Councils are to complete the update of their local environmental plan within three years of the district plans being finalised. This involves councils:* *E21. Reviewing their strategic planning framework, including a review of the existing local environmental plans against the relevant District Plan* *E22. Undertaking necessary studies and strategies and preparing a local strategic planning statement which will guide the update of the local environmental plans*.	Comment: Council is currently scoping detailed studies to inform the preparation of a new comprehensive LEP, including the preparation of a 'local strategic planning statement' for the Bexley North local centre.	**NO -** Inconsistency justified. The DPE advises that Metropolitan Councils are not expected to have their local strategic planning statements prepared until mid-2019 at the earliest. However, the above, the Planning Proposal is considered generally consistent with the principles for local centres established in the ECDP.
Local plans			
Rockdale Community Strategic Plan (adopted 15 June 2011)	Villages and Local Centres *Redevelopment within these centres is encouraged as a means of increasing residential densities in close proximity to public transport and services. Redevelopment proposals would need to recognise the desired local character of the centre.*	Comment: The Planning Proposal is consistent with the Plan to increase residential densities in close proximity to public transport.	**NO -** Inconsistency justified.

Name of Strategic Plan	Directions, priorities, objectives and actions	Planning Proposal consistency with Strategic Plan	Consistency Y/ N
	Rockdale Tomorrow: *Future growth is likely to occur in the centres of Rockdale, Wolli Creek, Brighton Le Sands, Bexley and Bexley North, which have the most significant opportunities for redevelopment through the presence of larger sites which are more readily able to be developed. The Rockdale LEP 2011 contains incentives to encourage development in these centres.*	It is noted that the subject site was not included in the Rockdale LEP 2011 for intensification of development at the time.	As noted above, the Planning Proposal is generally consistent with the principles for local centres established in the ECDP.

Any other likely environmental effects as a result of the planning proposal?

Traffic & Vehicular Access

A traffic and parking assessment report has been prepared to inform the draft Planning Proposal, which concluded that there would be no unacceptable impacts on traffic safety and that the road network, including intersections, could accommodate the redevelopment of the land. A copy of the report is included as ***Attachment 4***.

An independent review of the submitted traffic and parking assessment report did not raise any significant concerns in relation to traffic generation or safety that would preclude the site from being rezoned to R4 High Density Residential.

In addition, the subject site is located within 400m walking distance of shops and services within Bexley North local centre; the public entrance to Bexley North rail station; and regular bus services operated by Sydney Buses. This is likely to assist in reducing vehicle movements generated by redevelopment of the subject site.

If Council and the DPE support the draft Planning Proposal, any proposed Development Application(s) would need to be supported by a further detailed traffic impact assessment.

Voluntary Planning Agreement (VPA)

A draft VPA offer has been made to Council and a report will be provided to Council.

Conclusion

The Planning Proposal seeks to achieve a strategic planning outcome that will facilitate higher density living opportunities within 400 metres walking distance of Bexley North rail station and the shops and services in Bexley North local centre. This Planning Proposal is consistent with the directions and planning priorities contained in the Greater Sydney Region Plan and the

Eastern City District Plan. The proposed increase in height and FSR is consistent with the surrounding area.

Community Engagement

Should the Planning Proposal proceed through Gateway, community consultation will be undertaken in accordance with section 3.34 of the EP&A Act. The specific requirements for community consultation will be listed in the Gateway determination, including any government agencies that are to be consulted.

Attachments

1 Planning Proposal

2 Urban Context Report

3 Traffic and Parking Assessment Report

4 Contamination Assessment

Planning Proposal

Rockdale Local Environmental Plan 2011

No 88-96 New Illawarra Road & No 307-311A Bexley Road, Bexley North

Proposed Rezoning of land to Residential High Density R4 with associated amendments to building height and FSR

Bayside Council

May 2017

(amended January 2018)

Contents

Table of revisions

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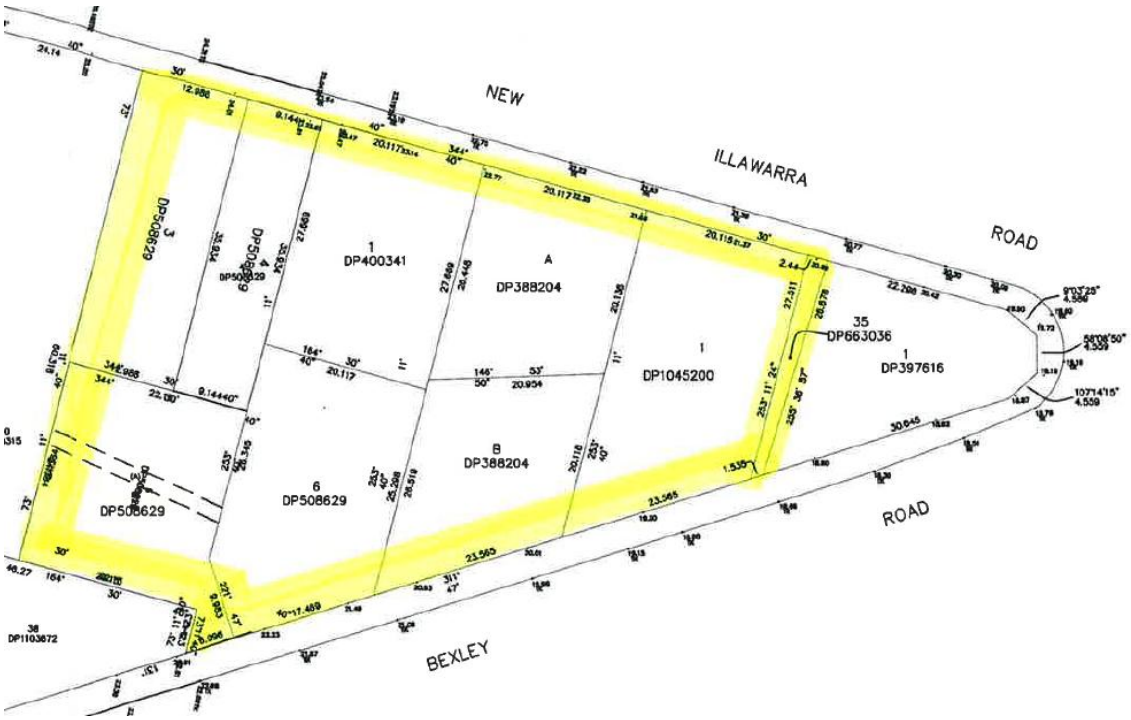
Introduction

This Planning Proposal explains the intended effect of, and justification, for the proposed amendment to *Rockdale Local Environmental Plan 2011 (Rockdale LEP 2011)*. It has been prepared in accordance with Section 55 of the *Environmental Planning and Assessment Act 1979* and the relevant Department of Planning and Environment guides, including 'A Guide to Preparing Local Environment Plans' and 'A Guide to Preparing Planning Proposals'.

Background

This planning proposal has been prepared for land known as No 88-96 New Illawarra Road and No 307-311A Bexley Road, Bexley North. The planning proposal relates to the R2 Low Density zoned land fronting Bexley Road and New Illawarra Road, North Bexley.



The subject land is legally identified as Lot 35 in DP 663036; Lot 1 in DP 1045200; Lot A in DP 388204; Lot B in DP 388204; Lot 1 in DP 400341; Lot 6 in DP 508629; Lots 3 and 4 in DP 508629; and Lot 5 in DP 508629.

Adjoining the subject site to the north is Lot 1 in DP 397616, a triangular shaped parcel of open space at the point or intersection of New Illawarra Road and Bexley Road, which provides an ideal landscaped setting to the subject site. This open space parcel of land is suitable for embellishment works generating a public benefit. Such works will be discussed with Council and can form part of a formal voluntary planning agreement.

Adjoining the subject site to the south is land owned by the Department of Family and Community Services (Dept of Housing). It is understood that the adjoining two lots are subject to a development application to Council in the near future for the erection of a residential flat building for public housing.

The subject land has been identified as being suitable for an up-zoning based on its location characteristics being within walking distance to Bexley North Railway Station, connectivity to the North Bexley town centre, existence of a redundant service station, its unique configuration on the street block being separated by housing lots further to the south by Department of Family and Community Services land. In addition the subject site has potential for the erection of coordinated built form, address of local overland flow issues and public domain improvements.

Accordingly, the applicant proposes to rezone the subject land from R2 Low Density Residential to R4 High Density Residential, so as to facilitate the construction of three (3) residential flat buildings ranging in building height from 5 to 6 storeys.

The subject is ideally situated on the southern fringe of the North Bexley town centre and benefits from having two street frontages to Bexley Road and New Illawarra Road. The subject site has a total area of **4,257m^2**.

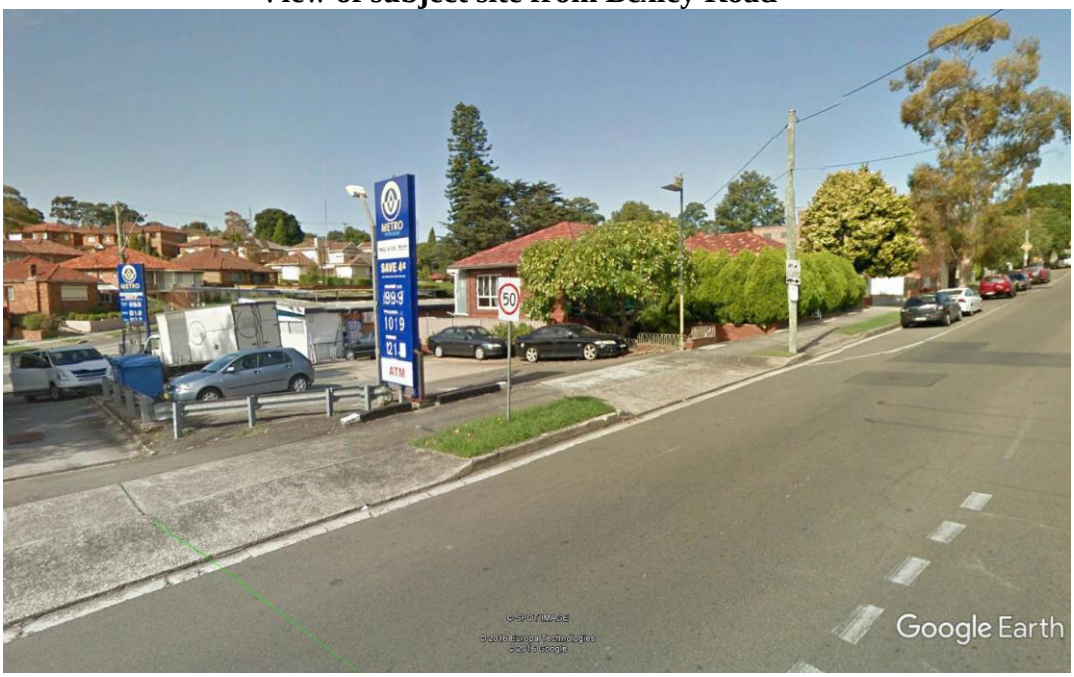
The subject site has no heritage significance, nor is it located within a heritage conservation area. There are no heritage items adjoining the property.

Applicable to the subject site currently are the provisions of Rockdale Local Environmental Plan 2011 and associated Development control Plan. Pursuant to which the subject land is zoned R2 Low Density Residential, has a maximum building height limit of 8.5m and a maximum floor space ratio (FSR) of 0.5:1. The current planning controls stifle redevelopment opportunities of what is considered to be a unique and valuable parcel of land within the North Bexley town centre context.

As a matter of background, the applicant has had discussions with Council as to the feasibility of pursuing the up-zoning. Council staff have advised that while there are no immediate plans by Council to rezone the land, the subject land has potentially redevelopment characteristics.

Property owners within the street block have been approached by the applicant inviting support for the proposal inclusive of the Department of Family and Community Services (The ex Department of Housing). The property owners within the subject site have been consulted and agreement obtained to pursue the planning proposal. Contact has also been made with the Department of Family and Community Services. Representatives have advised that there is no need for a rezoning of their land as the Department was seeking to submit a development application for the development of their site pursuant to current legislation.

View of subject site from Bexley Road



View of subject site from New Illawarra Road

Part 1 - Objectives or Intended Outcomes

The objective of the Planning Proposal is to amend *Rockdale LEP 2011* to facilitate the rezoning of the subject site from R2 Low Density Residential to R4 High Density Residential permitting the construction of three (3) residential flat buildings ranging in building height from 5 to 6 storeys.

A detailed site and urban analysis has been prepared by Urban Link Pty Ltd.

The proposed design concept has been developed to promote and reflect the Local and State planning metropolitan initiatives for renewal and consolidation of sites near major transport nodes. The scale and density of the proposed buildings is site specifically designed and meant to reflect the desired future character of development within and near the town centres within the Bayside Local Government Area.

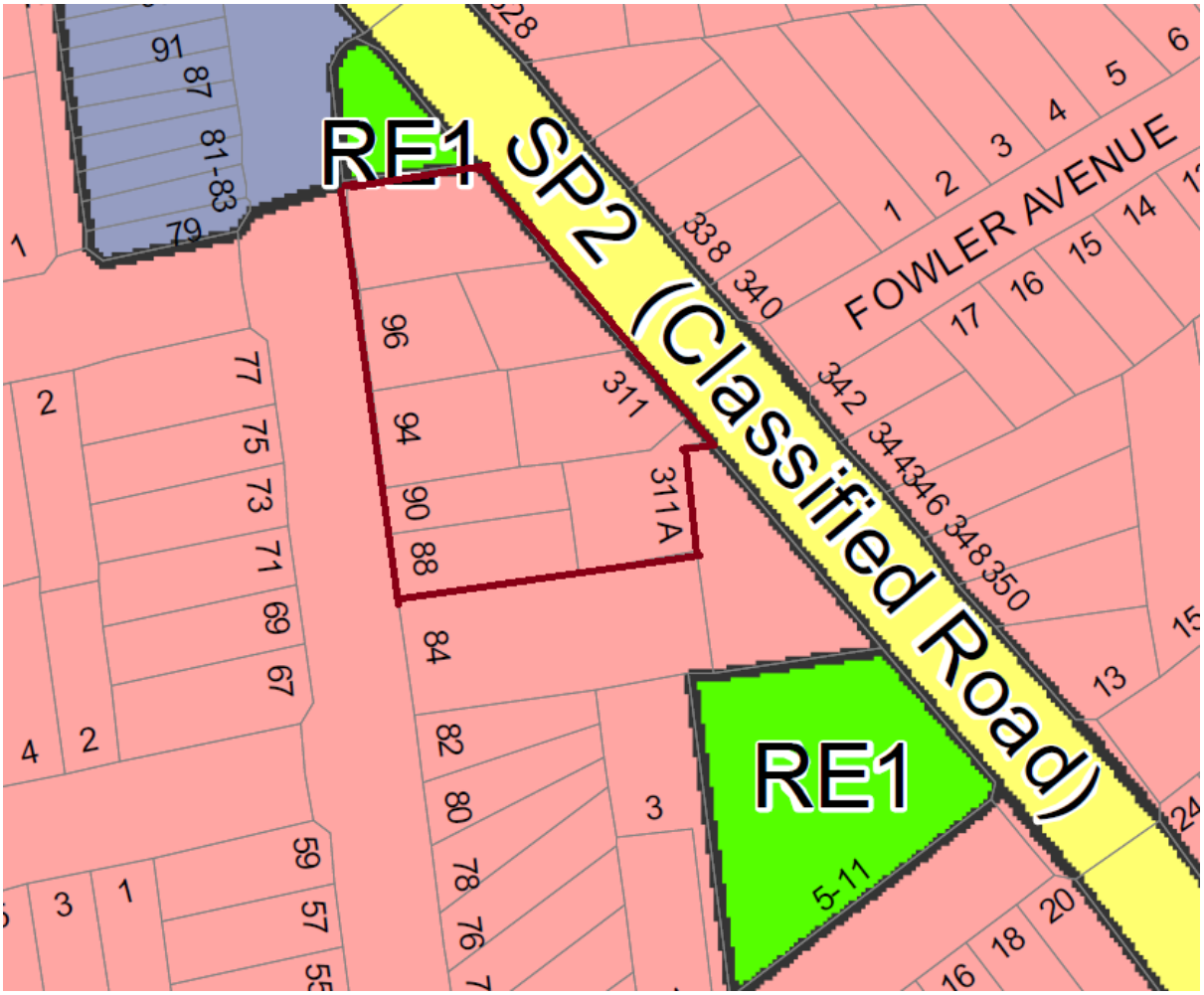
The proposed design and amendments to the planning instrument effectively fast tracks Council initiatives. The proposed development outcome provides for building heights between 5 and 6 storeys - 20.5m and a maximum floor space ratio of 1.9:1; the planning proposal provides for corresponding amendments to the zoning, height and floor space ratio controls under the Rockdale Local Environmental Plan 2011.

The proposed up-zoning of the land to R4 High Density Residential enables the development of the site with residential flat buildings which has the potential of increasing housing supply in the precinct and generating a community benefit as follows:

- providing additional affordable housing opportunities within a well serviced locality close to public transport and the work place.
- Utilising a valuable land parcel which presently contains in part a redundant service station;
- Capitalising on existing service infrastructure and transport services.

Part 2 - Explanation of Provisions

Map LZN_001



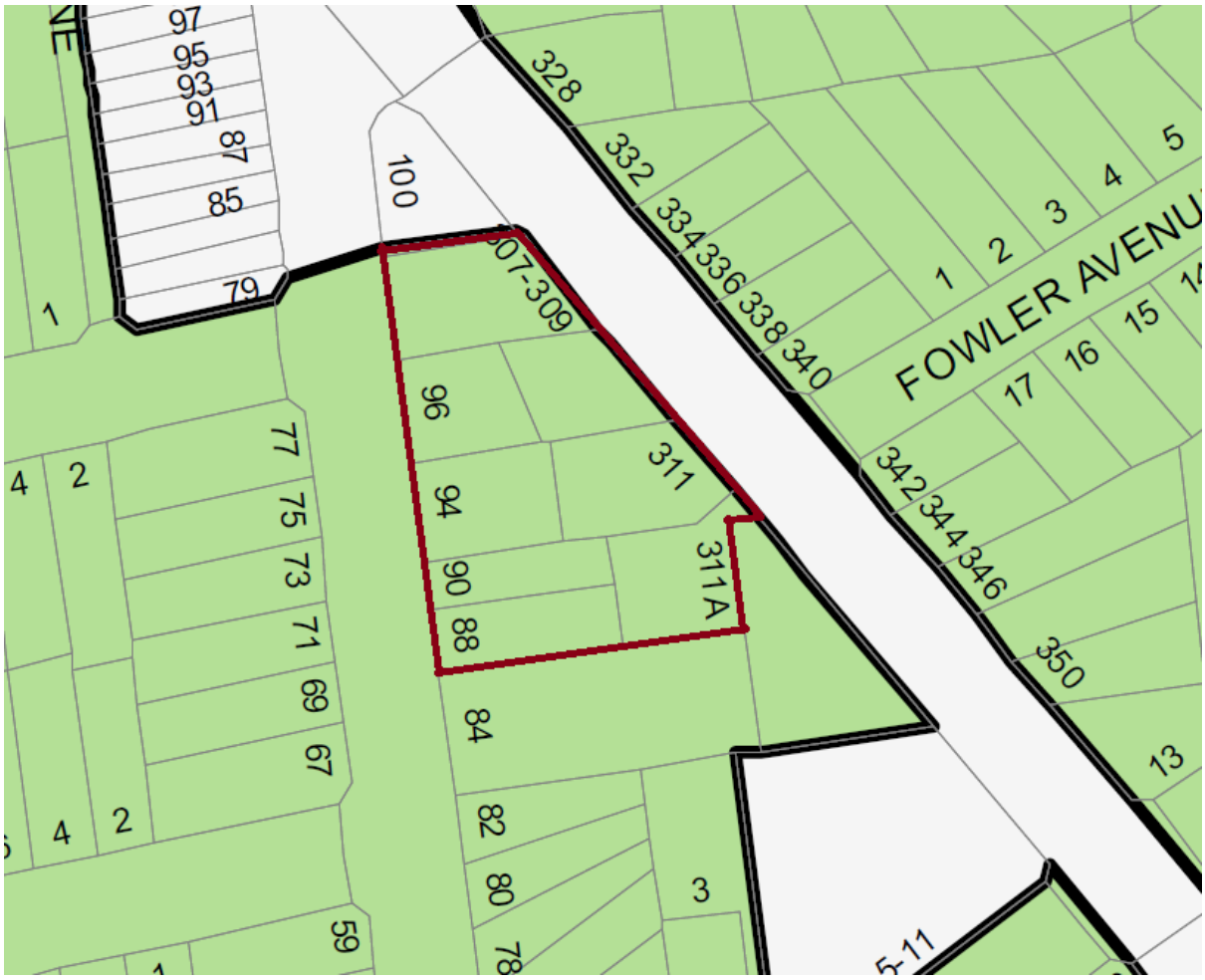
Extract of Current Zoning Map

The *Rockdale Local Environmental Plan 2011* Zoning Map is proposed to be amended as per Table 1 below.

Table 1 – Proposed Map Amendments

Map Tile No.	Amendment	Explanation
Zoning Map	• Up-zone the land from R2 Low density residential to R4 High Density Residential	The proposed R4 zoning enables the construction of residential flat buildings on the site

Map LSZ_001



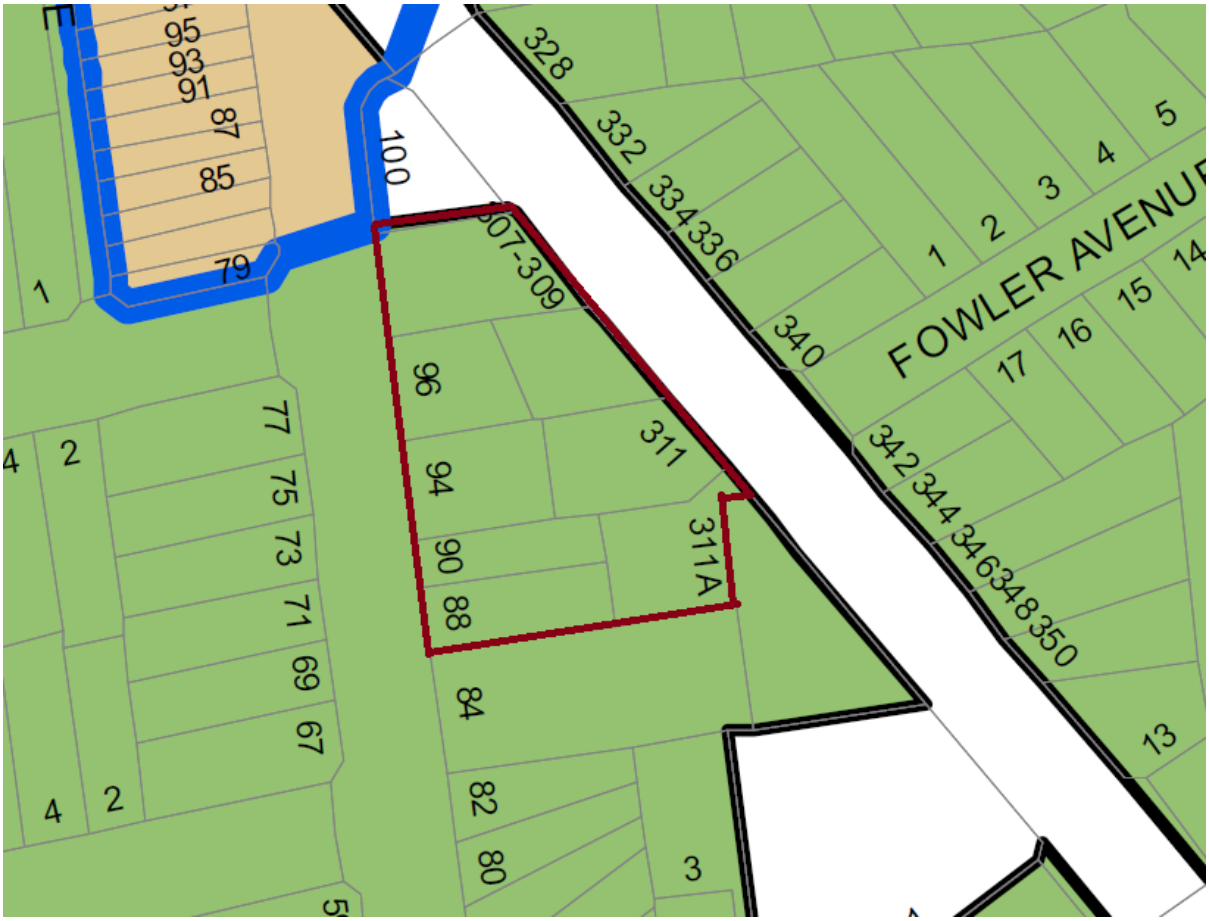
Extract of the Lot Size Map

The *Rockdale Local Environmental Plan 2011* Lot Size Map is proposed to be amended as per Table 1 below.

Table 1 – Proposed Map Amendments

Map Tile No.	Amendment	Explanation
Lot Size Map	• Remove the minimum lot size reference	Maintain consistency across the Local Environmental Plan

Map HOB_001



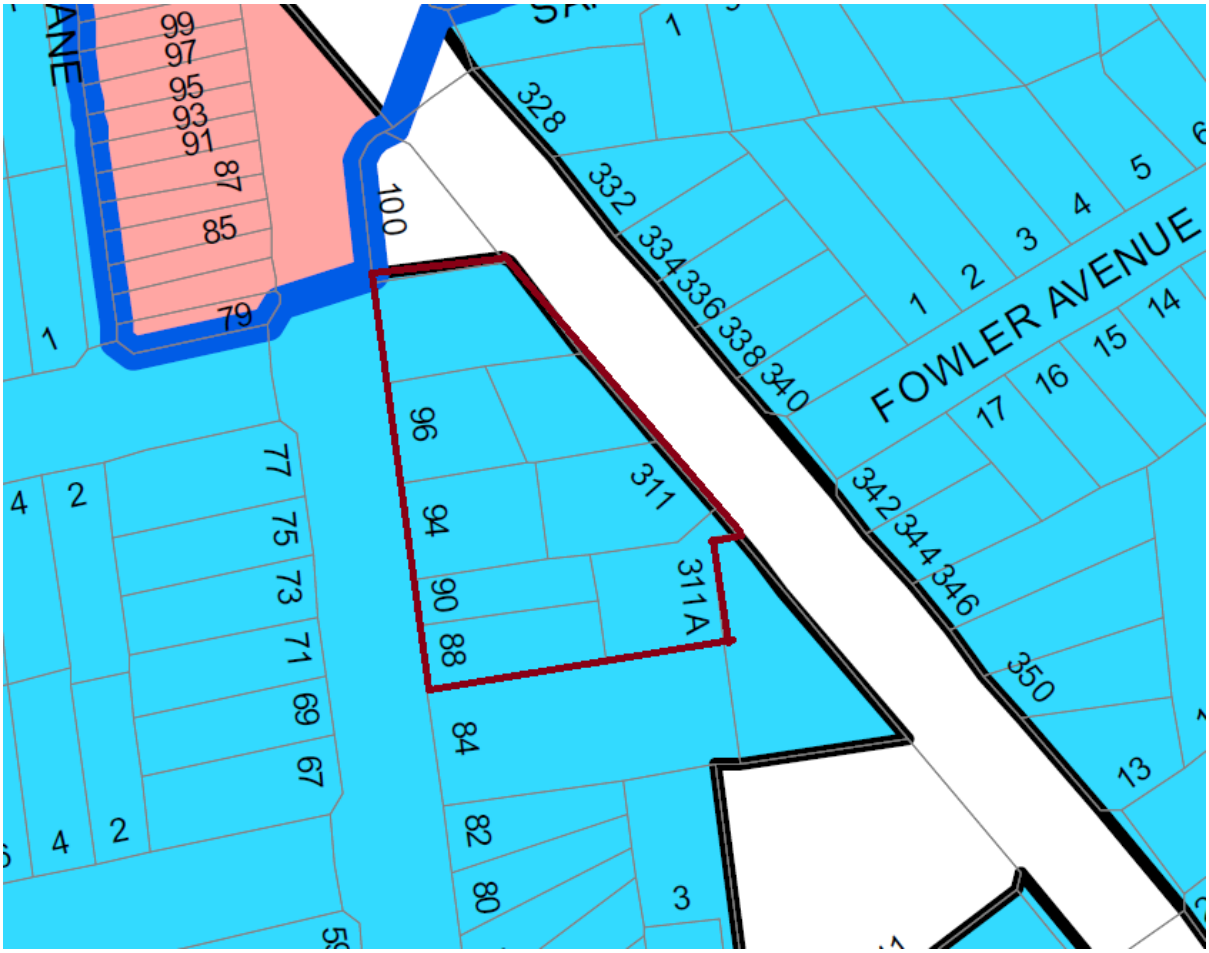
Extract from the Height of Building Map

The *Rockdale Local Environmental Plan 2011* Height of Building Map is proposed to be amended as per Table 1 below.

Table 1 – Proposed Map Amendments

Map Tile No.	Amendment	Explanation
Height of Building Map	• Delete reference to I - 8.5m maximum height and replace with Q2 - 20.5m	The proposed height provides opportunity to provide a 6 storey building catering for overland flow issues and maximising design treatment of the buildings.

Map FSR_001



Extract from the Maximum Floor Space Ratio Map

The *Rockdale Local Environmental Plan 2011* Maximum Floor Space Ratio Map is proposed to be amended as per Table 1 below.

Table 1 – Proposed Map Amendments

Map Tile No.	Amendment	Explanation
Floor Space Ratio Map	• Delete reference to D - 0.5:1 and replace with T1 - 2:1	The proposed Floor Space Ratio provides opportunity to provide a 6 storey building and maximise the quality of apartments.

B There are no other provisions of the Local Environmental Plan requiring amendment to facilitate this planning proposal.

To facilitate the above, it will be necessary to prepare a site specific development control plan detailing the scale of building spread across the site; the proposed setbacks; landscape treatment and the desired driveway locations. The development control plan can be prepared once the preferred design solution for the site is determined through the consultation process.

Part 3 - Justification

Question 1: Is the planning proposal a result of any strategic study or report?

The planning proposal is not a direct result of a specific strategic study or report for the site undertaken by a public authority. The planning proposal has evolved after much consultation with Council staff and undertaking an in-depth investigation into the redevelopment potential of the site. The derived planning outcome for the site is meritorious in generating a planning and built form outcome which is consistent with the broader planning objectives for the Bayside Local Government Area as indentified by 'Draft Greater Sydney Region Plan' planning strategy. This draft plan seek to increase housing densities and employment in and near town centres given their high level of access to public transport (both rail and buses), the availability of local support services and the convenient accessibility of the town centre and other major employment areas.

Bexley North is a town centre portraying such location characteristics however the existing planning controls are in need of review to keep pace with initiatives being undertaken in other town centres and Local Government Areas such as Parramatta, Merrylands, Top Ryde and Burwood and the like.

Accordingly the subject planning proposal warrants consideration.

Question 2: Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The current planning controls and land use table are limiting in terms of promoting orderly redevelopment opportunities consummate with broader planning strategies near town centres.

A rezoning is needed to provide the necessary stimulus to facilitate orderly development, to engage neighbour co-operation in the process, derive pedestrian access improvements to and around the site and embellishment upgrades of open space within the street block.

This planning proposal establishes the appropriate planning mechanism to facilitate the optimum redevelopment opportunities for the site as Council have no plans to undertake the same in the coming years.

The site currently contains a redundant service station use, which operates pursuant to the 'existing use rights' provisions. The current R2 Residential Low Density land use table does not provide the incentives or opportunities to undertake viable redevelopment. The current zoning also under utilises site opportunities and location characteristics.

There is no other way available to redevelop the site and achieve orderly and economic development outcomes.

B Relationship to strategic planning framework

Question 3: Is the planning proposal consistent with the objectives and actions of the applicable regional, sub-regional or district plan or strategy (including any exhibited draft plans or strategies)?

a) Does the proposal have strategic merit? Is it:

• *Consistent with the relevant regional plan outside of the* Draft Greater Sydney Region Plan, *the relevant district plan within the Greater Sydney Region, or corridor/precinct plans applying to the site, including any draft regional, district or corridor/precinct plans released for public comment; or*
• *Consistent with a relevant local council strategy that has been endorsed by the Department; or*
• *Responding to a change in circumstances, such as the investment in new infrastructure or changing demographic trends that have not been recognised by existing planning controls*.

The planning proposal and the subsequent redevelopment of the subject land is considered to derive inherent net community benefit as follows:

- The redevelopment of the site will remove a redundant service station and prohibited use from the land;
- The redevelopment will remove old and redundant dwellings and constraints associated with irregular shaped small allotments;
- The redevelopment will occur in accordance with an endorsed site specific Development Control Plan regulating built form and open space provision;
- Contemporary and alternate housing forms will be generated providing affordable housing opportunities elevated above busy roads;

- Pedestrian access to the site will be reviewed and improved with the potential for a new pedestrian footpaths in New Illawarra Road and/or Bexley Road;
- The open space parcels 'book ending' the subject site can be suitably embellished as part of the proposal given the likely increase in patronage should the application be approved;
- The shape of the site introduces opportunities to generate attractive and contemporary built form within a landscaped setting pronouncing the approach to the Bexley North town centre from a southern approach;
- The planning of the site will rectify current overland flow issues and regularise and storm water drainage across the site; and
- Approval of this application should stimulate a review and upgrade of controls applying to the Bexley North town centre to the benefit of the broader community.

No significant adverse community impacts or significant adverse environmental impacts are likely to arise from the proposal. A review of the development concept plans prepared as part of this submission confirms shadows cast by future buildings can be contained within the site or within the road reservations. Additionally the consolidation of individual driveways and provision of new strategically positioned driveways will reduce the risk of vehicle/pedestrian conflict arising from cars reversing onto the main roads.

Consideration	**Comment**	**Benefit**
Will the Local Environmental Plan be compatible with agreed State and regional strategic direction for development in the area	The proposed scale and type of development is appropriate on a fringe of the town centre. The higher density introduces opportunity for contemporary affordable accommodation within walking distance of the town centre and railway station thus reducing car dependency.	Positive

Is the proposal consistent with the Draft Greater Sydney Region Plan or other regional/sub-regional strategy?	The proposal is compatible with the strategic framework. The proposal facilitates housing which has the potential to accommodate for a growing population within Metropolitan Sydney, which is ideally located near transport nodes and commercial centres.	Positive
Is the planning proposal likely to create a precedent or create or change the expectations of the landowner or other landholders?	Given the sites close proximity to the town centre, the planning proposal would assist in meeting people's expectations for higher density and urban renewal. The planning proposal does not relate to an isolated site but includes several site which achieves a coordinated response. It is envisaged that the planning proposal may provide a stimulus for further consideration within the Bexley North town centre.	Neutral
Have the cumulative effects of other spot rezoning proposals in the locality been considered? What was the outcome of these considerations?	There are no other spot rezoning applications which have occurred in the vicinity of the site.	Neutral
Will the Local Environmental Plan facilitate a permanent employment generating activity or result in a loss of	The proposal relates to an up-zoning of residential land. There will not be loss of employment land. The existing service station at the site	Neutral

employment lands?	operates under 'existing use rights'. A service station is currently a prohibited use in the R2 Low Density Residential zone under the Rockdale Local Environmental Plan 2011. Given this there will be no loss of employment land, as the site is currently zoned for residential purposes.	
Will the planning proposal impact upon the supply of residential land and therefore housing supply and affordability?	The planning proposal provides increased housing densities in a well serviced locality improving supply and thus affordability (having regard to the fundamental economic principle of 'supply and demand').	Positive
Is the existing public infrastructure (roads, rail, utilities) capable of servicing the proposed site? Is there good pedestrian and cycling access? Is public transport currently available or is there infrastructure capacity to support future public transport?	The subject site is within convenient walking distance of public transport including railway and bus services. It is proposed to improve access to the site by creating a pedestrian linkages with the town centre via pedestrian crossings in appropriate locations. All services including electricity, sewer and phone are available to the site.	Positive

Will the proposal result in changes to the car distances travelled by customers, employees and suppliers? If so, what are the likely impacts in terms of greenhouse gas emissions, operating costs and road safety?	The proximity of good public transport services reduces car dependency thereby promoting positive environmental outcomes.	Positive
Are there significant Government investments in infrastructure or services in the area whose patronage will be affected by the proposal? If so, what is the expected impact?	There are no immediate Council or State Government strategies for the up-grade of railway infrastructure or services in the locality. Notwithstanding North Bexley Station appears to have undergone a recent upgrade.	Neutral
Will the proposal impact on land that the Government has identified a need to protect (e.g. land with high biodiversity values) or have other environmental impacts? Is the land constrained by environmental factors such as flooding?	The key characteristics of the site are: • The subject site is not identified as being of heritage significance. • The site is not located within a heritage conservation area. • The subject site does not contain significant vegetation or critical habitat. • The subject site is affected by overland flows during peak periods however is not identified as being significantly flood prone. • The site is not within a bushfire hazard area.	Positive

	• The site falls to the street enabling gravity flow of storm water to existing infrastructure in Bexley Road. • The subject site contains a service station which is subject to contaminants, however investigations reveal that contamination is not a constraint to the development of the site. A decontamination of the service station site can be effectively undertaken. The remaining lots are used for residential purposes.	
Will the planning proposal be compatible/complementary with surrounding land uses? What is the impact on amenity in the location and wider community? Will the public domain improve?	The proposed development represents a higher scale of development which will be effectively contained within a street block. Shadows are contained effectively within the site and road reservations. Storm water from the site can be directed via gravity flow to Council drainage infrastructure. Noise generated by the use is purely domestic and contained by strata by-laws. The proposed transition in built form from north to south is an appropriate response to protecting nearby residential amenity and maintaining a	Positive

	reasonable scale of development relative to the nearby zones.	
Will the planning proposal contribute to improved transport or other services in the locality?	The subject site is within close proximity of regular train and bus services, thus increasing patronage of public transport use, thus justifying its expense and viability.	Positive
Will the planning proposal create any significant demand on public services or facilities?	Apart from increased funding coming from section 94 contributions, a Voluntary Planning Agreement (VPA) can be entered into providing for the upgrade/embellishment of the two parks within the street block and the provision of new pedestrian footpaths in appropriate locations. The Voluntary Planning Agreement will be subject to consultation with Council.	Positive
Will the planning proposal require the expenditure of public money?	The planning proposal does not involve the expenditure of public money.	Neutral

The Planning Proposal is consistent with the objectives and actions contained in the 'Draft Greater Sydney Plan' and the more specific 'Draft Eastern City District Plan'.

Draft Greater Sydney Region Plan

The draft Greater Sydney Region Plan is built on a vision where the people of Greater Sydney live within 30 minutes of their jobs, education and health facilities, services and great places. This is consistent with the 10 Directions in Directions for a Greater Sydney which establish the aspirations for the region over the next 40 years and are a core component of the vision and a measure of the Plan's performance.

The Plan provides an integrated, long–term planning framework that is intended to manage Sydney's growth and strengthen its economic development over the next 40 years. The Plan sets in place objectives and actions for Sydney to become a more compact, networked city with improved accessibility, capable of supporting more jobs, homes and lifestyle opportunities within the existing urban footprint based on the concept of a ***'30-minute City'***.

The Plan establishes key objectives and actions to achieve desired outcomes of:

- *creates a metropolis of three cities, rebalancing growth and opportunities for people across Greater Sydney;*
- *uses the airport as a catalyst to generate a diversity of jobs in the Western City;*
- *improves housing affordability and choice aligned with local infrastructure across the city;*
- *plans and prioritises infrastructure early to support a growing Greater Sydney through growth infrastructure compacts;*
- *protects and enhances the city's unique landscape by recognising its environmental diversity;*
- *creates great local places by protecting heritage and biodiversity, while enhancing the Green Grid and tree canopy cover;*
- *uses quality design to create great places, walkable communities and shared spaces; and*
- *delivers a 30-minute city to provide better access to jobs, schools, and health care within 30 minutes of people's homes.*

The planning proposal is consistent with the objectives and actions of the Draft Greater Sydney Plan which aims to achieve 30 objectives centred around enhancing infrastructure, transportation, employment and social cohesion. The following objectives and actions are particularly relevant to the circumstances of the planning proposal.

The Plan recognises that concentrating a greater range of activities near one another in centres well served by public transport makes it easier for people to go about their daily activities and helps to create lively, functional places in which to live, work, socialise and invest. The benefits of concentrating activities in centres include:

• improved access to retail, office, health, education, leisure and entertainment facilities, and community and personal services;

• increased opportunities for a greater diversity of dwellings and more diverse communities;

• encouraging collaboration, healthy competition and innovation among businesses through clustering;

• making better use of infrastructure, and making public transport improvements more viable;

• promoting sustainable and accessible transport and healthier communities by increasing walking, cycling and public transport options for more people by making more activities available in one location;

• slowing the growth of greenhouse gas emissions by reducing the number of car journeys needed to access services;

• reducing pressure for development to occur in less accessible locations, and

• creating vibrant places which operate as a focus for community activity and events and which help to build social inclusion.

Objective 10 in particular relates to achieving 'greater housing supply'. *Providing ongoing housing supply and a range of housing types in the right locations will create more liveable neighbourhoods and support Greater Sydney's growing population.*

The NSW Government has identified that 725,000 new homes will be needed to meet demand based on current population projections to 2036. By 2056, it is anticipated that significant further housing supply will be required to meet Greater Sydney's continued strong population growth.

Increasing the density of development on the subject site contributes to the fundamental objective of increasing housing densities in well serviced locations.

Creating capacity for new housing in the right locations requires clear criteria for where capacity is to be located. Accommodating homes for the next generation needs to be linked to local infrastructure - both to optimise existing infrastructure use and to maximise investment in new infrastructure. Opportunities for capacity can be realised by urban renewal, local infill developments and land release areas.

The planning proposal promotes the redevelopment of the site with buildings displaying good urban and architectural design on sites, which benefit from excellent access to the town centre and railway station.

Housing Sydney's Population

Housing targets for the Eastern District in which the subject site is contained is provided below:

District	0–5 year housing supply target: 2016–2021		20-year strategic housing target: 2016–2036
	46,550	157,500	
Eastern City	46,550		157,500

The Draft Plan aims to focus the bulk of new housing development in or near centres with good public transport. The Draft Plan requires new Local Environmental Plan's and planning proposals to support this principle.

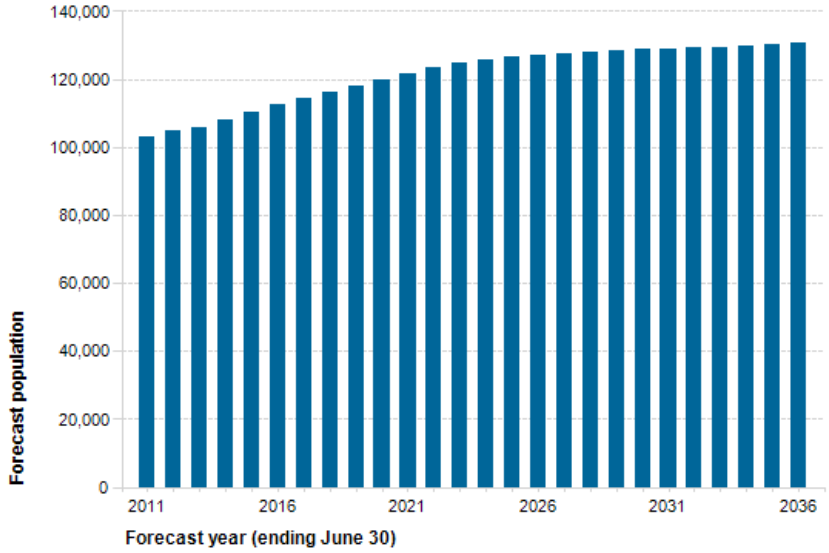
The subject site is located within walking distance to many services and facilities. The site has good public transport access (including train and bus) that provides direct and frequent access to major employment centres including the Bayside and Sydney Central Business District. Increasing the residential density on the subject site also promotes a quality lifestyle benefitting from nearby recreational facilities, employment opportunities, restaurants, schools and churches. Increasing the density of development on the site promotes this key policy objective of the Metropolitan Plan.

As shown in the graph below, Bayside Council is expected to see significant population growth. According to Profile iD (adapted data from ABS), Rockdale anticipates to house 130,497 residents by 2036, resulting in an 18.4% increase from 2015. The proposal meets this objective as the development not only supplies land for residential development near Bexley North town centre with

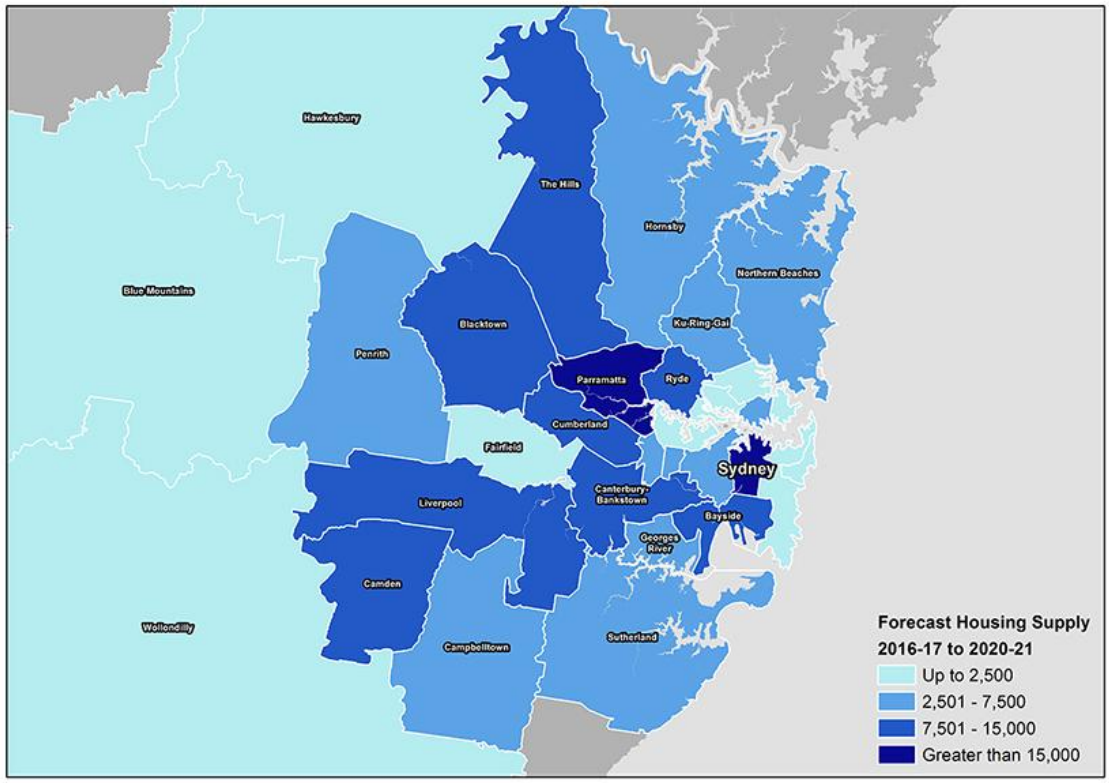
good public transport, but it also caters for a growing population within Bayside Council.

Forecast population

Rockdale City



Population and household forecasts, 2011 to 2036, prepared by .id, November 2013.



Population forecasts for Bayside are for an increase in population by 7,500 people over the next 5 year period.

A further aim is to *"produce housing that suits our expected future needs".*

***Councils** are to investigate opportunities for supply and a diversity of housing particularly around centres to create more walkable neighbourhoods. For councils, the main tool for understanding the need and planning for housing and infrastructure delivery is housing strategies. Councils' housing strategies will need to address the 0–5 and 6–10 year local (when agreed) or district housing targets as well as 20-year strategic district targets outlined in this draft Plan.*

The 0–5-year housing supply targets are a minimum and councils will need to find additional opportunities to exceed their target to address demand.

***Developers** play an important role in supporting housing outcomes. The development industry needs to continually provide new housing and translate the development capacity created by the planning system into approvals and supply.*

Comment:

The development plans that support the planning proposal provide opportunity for a diversity of housing choice including the provision of one bedroom, two bedroom and 3 bedroom apartments contributing to the future housing priorities identified by the Plan.

A primary objective is to *"improve housing affordability".* The planning proposal provides increased housing densities in a well serviced locality improving supply and thus affordability (having regard to the fundamental economic principle of 'supply and demand').

The proposed development will provide a mix of apartment types within a self contained environment inclusive of communal open space, on-site parking and security, thus placing downward pressure on housing costs and promoting housing affordability.

Affordability is further promoted by not 'over designing' the proposed apartments in terms of floor areas however compliance with State Environmental Planning Policy 65 criteria is readily achieved.

The Plan also promotes high quality design to improve the image and market attractiveness of centres by ensuring the design of new residential development on landmark sites and the urban renewal of centres is of a high quality. The planning proposal is supported by concept architectural massing plans outlining the possible desired development outcome for the site. The development is capable of meeting the principles and controls of State Environmental Planning Policy No 65 and is intended to generate design excellence.

Draft Eastern City District Plan

Bayside Council is sited within the Eastern City District and includes other Council areas of Burwood, City of Sydney, Canada Bay, Inner West, Randwick, Strathfield, Waverley and Woollahra local government areas.

The Department of Planning and Environment identifies the District as being on *the precipice of great change as it solidifies its position as the nation's economic powerhouse*.

The 40-year vision is *to enable a more productive, liveable and sustainable Greater Sydney*.

The Draft Plan seeks to make the best use of public assets such as transport and infrastructure to make Sydney more sustainable and efficient. The Strategy identifies that the focus of housing growth will be in and around the many centres within the Metropolitan Urban Area. The aim is to deliver more and different types of housing across the city in line with employment and infrastructure and market demand to create improved quality of life, increased productivity, better environmental management and heightened accessibility.

The planning proposal provides for the increase in the density of housing on a site that is ideally located near public transport and support service infrastructure. Increasing the density of development assists in achieving housing targets and supports the fundamental principles of increasing densities in well serviced locations.

The planning proposal provides increased housing densities in a well serviced locality contributing to housing supply and thus affordability (having regard to the fundamental economic principle of 'supply and demand').

The redevelopment concept plans have been designed to achieve State Environmental Planning Policy 65 requirements. The apartments will be designed to provide a high level of amenity but have not been 'over designed' as this would lead to increased market prices for the end product. In this respect:

1. The development minimises the provision of on-site car parking so as to encourage the use of public transport services.

2. The proposed apartment floor areas will represent 'comfortable' and not 'excessive' floor space.

The above design characteristics place downward pressure on the end market price of the apartments contributing to housing affordability.

The planning proposal will facilitate the development of the subject site in a manner that is consistent with the desired future character of Bexley North. The planning proposal is supported by architectural concept plans of the desired development outcome for the site. The development has been designed to achieve the principles of State Environmental Planning Policy No 65 (a design verification statement accompanies the planning proposal) and can stimulate consideration for the planning of the North Bexley town centre.

The proposed up-zoning can facilitate the following:

- Greater housing choice and affordability;
- Attractive built form in a landscaped setting;
- Population diversity;
- An upgrade to the public reserve adjoining the site and situated at the intersection of the two main roads;
- Stimulate planning consideration within the Bexley North town centre;

The site has no inherent sensitivity in terms of being on a ridgeline, near the coast or near water courses.

Question 5: Is the planning proposal consistent with a council's local strategy or other local strategic plan?

Rockdale City Community Strategic Plan

Council's Vision is: One Community, Many Cultures, Endless Opportunity. The blueprint for the Rockdale community for 2025 is to be achieved through strategic community outcomes:

- **Outcome 1** – Rockdale is a welcoming and creative City with active, healthy and safe communities.
- **Outcome 2** – Rockdale is a City with a high quality natural and built environment and valued heritage in liveable neighbourhoods. A City that is easy to get around and has good links and connections to other parts of Sydney and beyond.
- **Outcome 3** – Rockdale is a City with a thriving economy that provides jobs for local people and opportunities for lifelong learning.
- **Outcome 4** – Rockdale is a City with engaged communities, effective leadership and access to decision making.

Comment:

The planning proposal is consistent with and promotes the long term objectives established in the Community strategic plan.

In this respect:

- The planning proposal will facilitate the redevelopment of the site with buildings of high urban and architectural merit positively contributing to the image of the City and the streetscapes of North Bexley.
- The proposed redevelopment provides a diversity of residential apartment types promoting the living city concept and contributing to the vibrancy of the town centre.
- The proposed redevelopment will be designed to promote an environmentally efficient living environment.
- The proposed redevelopment promotes good environmental outcomes by encouraging walking and cycling and reducing private vehicle dependency. The proximity of the site to public transport nodes supports and promotes public transport patronage.

- The location of the site promotes a high quality lifestyle for future residents particularly noting the close proximity of major sport and recreation facilities including theatres, restaurants, public open space and the like.
  The planning proposal promotes development that provides housing choice and diversity while retaining affordability

Rockdale Urban Strategy 2010

The Rockdale Urban Strategy identifies the planning priorities which will be the focus of future planning aimed at improving the quality and character of Rockdale. It provides a basis for the future direction and planning of Rockdale's natural and urban environment.

The Strategic Plan identifies eight strategic directions for Rockdale's long term plan:

- *Enhance the City's primary centres of* ***Rockdale and Brighton Le Sands*** *to create vibrant centres with improved linkage along Bay Street.*
- *Concentrate future development around the City's existing* ***villages and local centres****, improving their vibrancy and character through an increase in the local residential population, and reducing the need to travel*
- *Protect and utilise the City's natural resources in the three* ***open space corridors*** *which run through the City, to improve recreational opportunities, foster biodiversity, and add to the character of the City.*
- *Ensure that all aspects of development within the City are of a high* ***design quality****, creating a more attractive and liveable urban environment.*
- *Foster the growth of the emerging town centre at* ***Wolli Creek*** *which will accommodate much of the City's future populaton growth, and form a northern gateway to the City*
- *Encourage revitalisation of the* ***Princes Highway Corridor*** *to improve employment opportunities and present a more attractive image along this prominent vehicle route through the City.*
- *Improve the City's* ***sustainable transport*** *network to encourage alternative transport modes and provide better access to the City's attractions.*

- *Protect and enhance the **residential character** of the City's suburbs and neighbourhoods, to ensure they remain pleasant and amenable.*

The planning proposal is consistent with and promotes the long term objectives established in the Community strategic plan. In this respect:

- The planning proposal will facilitate the redevelopment of the site with buildings of high design quality and architectural merit positively contributing to the attractiveness and liveability of the environment.

- The proposed redevelopment will be designed to enhance the residential character within Bexley North and establishing a standard of development to follow with future urban renewal in the town centre.

- The proposed redevelopment promotes sustainable transport methods by encouraging walking and cycling. The proposal supports and promotes public transport patronage due to its close proximity to key public transport networks.

- The location of the site promotes a high quality lifestyle for future residents particularly noting the close proximity of recreation facilities including restaurants, public open space and the like.

- The planning proposal promotes development that provides housing choice and diversity while retaining affordability.

Residential Strategy 2007

The Residential Strategy contains 6 key strategic directions which aim to protect and improve opportunities for the people who live, work, have a business or who visit the City.

The 6 key recommendations are as follows:

1. *Focus additional residential growth in key town centres by encouraging mixed use development with economic incentives to stimulate redevelopment. The key centres to be targeted for extra growth include centres identified in the Destinations Rockdale and Thriving Town Centres Programs, these being the Rockdale Town Centre, Brighton Le*

*Sands, **Bexley North** and Arncliffe, as well as Kingsgrove, Bexley, Carlton and Kogarah West*

2. *Retain the scale and character of existing suburban areas in the City by introducing urban character statements into the Development Control Plan to guide future development and focussing new growth in town centres which provide transport, shopping and other services*
3. *Continue to provide for a range of housing types and sizes in appropriate locations throughout the City, including dual occupancy development, villas and townhouses, semi's and apartments*
4. *Manage potential land use conflicts involving residential development, by limiting residential development along the Princes Highway and providing transitional areas between industrial and residential uses at Turrella Street, Turrella and Garnet Street, Rockdale*
5. *Expand housing provision to include temporary housing by encouraging serviced apartments and hotels in the tourist zone in Brighton Le Sands*
6. *Improve public and social housing by encouraging the revitalisation of key public housing holdings at The Grand Parade, Brighton Le Sands and Eden Street, Arncliffe and encouraging the retention of boarding houses and caravan parks*
7. *Increase opportunities for seniors housing by encouraging new seniors housing in areas with flat topography and good access to transport, shops and services*
8. *Revitalise existing housing stock by investigating opportunities for the redevelopment of older strata units as they approach the end of their life cycle.*

The planning proposal is consistent with and promotes the recommendations of this Strategy:

- The additional housing stock associated with the proposal focuses on the anticipated residential growth within Bexley North.
- The applicant proposes to provide a range of housing types and sizes.

Transport and Access Strategy

The Transport and Access Strategy focuses on 'Making Rockdale a Better City'. The strategic directions outlined below all have a relationship to transport, accessibility and sustainability.

1. *Promoting a Healthy, Safe and Accessible Lifestyle*

2. *Environmental Quality*
3. *A Liveable City*
4. *Lifestyle Quality*
5. *Developing Reliable Transport and Safe Roads*
6. *Economic Prosperity*

The Strategy identifies Bexley North as one of the City of Rockdale's largest employment locations. Council anticipates additional residential development within Bexley North.

> *"This data shows that the largest employment locations in the City of Rockdale are Kogarah North, the International Terminal, Brighton Le Sands, Turrella, Monterey, Arncliffe and* ***Bexley North****... In terms of broad structure, additional residential development will be focused in key areas with adequate transport and services, these being along the East Hills line (Kingsgrove,* ***Bexley North*** *and Bardwell Park)".*

The proposal is consistent with this Strategy as the applicant proposes to cater for additional residential development within Bexley North providing greater patronage of town centre facilities and services.

Capacity Analysis and Built Form Study 2010

The Study states that the scale of recent redevelopment within the Bexley North Town Centre supports the concept of additional height and floor space ratio to be applied to the centre.

> *"The scale of recent redevelopments supports the concept of additional heights and FSR to be applied to the centre. There is additional capacity on the commuter train network to ensure transport choice for existing and future residents".*

Comment:

It is noted that council recognises the future growth potential of Bexley North town centre. It is anticipated that the proposed up-zoning encourages/stimulates future planning review of the town centre.

Table 3 below identifies how the Planning Proposal is consistent with the community outcomes.

Table 3 – Consistency with Rockdale City Community Strategic Plan

Outcome	Objective	Strategy	Consistency

Rockdale City Community Strategic Plan

Question 5: Is the planning proposal consistent with applicable State Environmental Planning Policies (SEPPs)?

The planning proposal is consistent with the provisions of the following State Environmental Planning Policies that are relevant to the circumstances of the proposal.

Table 4 - Consistency with State Environmental Planning Policies

No.	Title	Consistency with Planning Proposal
1	Development Standards	(Repealed by *RLEP 2011)*
14	Coastal Wetlands	Not Applicable
15	Rural Land sharing Communities	Repealed
19	Bushland in Urban Areas	Not Applicable
21	Caravan Parks	Not Applicable
22	Shops and Commercial	Not Applicable

	Premises	
26	Littoral Rainforests	Not Applicable
29	Western Sydney Recreation Area	Repealed
30	Intensive Aquaculture	Not Applicable
32	Urban Consolidation (Redevelopment of Urban Land)	Repealed
33	Hazardous and Offensive Development	Not Applicable
36	Manufactured Home Estates	Not Applicable
39	Spit Island Bird Habitat	Repealed
44	Koala Habitat Protection	Not Applicable
47	Moore Park Showground	Not Applicable
50	Canal Estate Development	Not Applicable
52	Farm Dams and Other Works in Land and Water Management Plan Areas	Not Applicable
55	Remediation of Land	Clause 6 of the SEPP requires potential site contamination and remediation to be considered by planning

		proposals in circumstances where there is a zoning amendment that would permit a change of use of the land. The applicant seeks to alter the zoning which applies to the site. A contamination report has been provided and identifies that the site is suitable for redevelopment. Will be consistent
59	Central Western Sydney Regional Open Space and Residential	Repealed
60	Exempt and Complying Development	(Repealed by *RLEP 2011*)
62	Sustainable Aquaculture	Not Applicable
64	Advertising and Signage	Not Applicable
65	Design Quality of Residential Flat Development	The primary objective of the SEPP is to improve the design quality of residential flat development in New South Wales. The design concept plans that form part of the planning proposal documentation have been prepared by a

		qualified architect. Will be consistent
70	Affordable Housing (Revised Schemes)	Not Applicable
71	Coastal Protection	Not Applicable
	(Affordable Rental Housing) 2009	Not Applicable
	(Building Sustainability Index: BASIX) 2004	BASIX certification will be required at the development application stage. Will be consistent
	(Exempt and Complying Development Codes) 2008	Not applicable
	(Housing for Seniors or People with a Disability) 2004	Not applicable
	(Infrastructure) 2007	Consistent
	(Kosciuszko National park Alpine Resorts) 2007	Not applicable
	(Kurnell Peninsula) 1989	Not applicable
	(Major Development) 2005	Not Applicable
	(Mining, Petroleum Production and Extractive Industries) 2007	Not Applicable

	(Miscellaneous Consent Provisions) 2007	Not applicable
	(Penrith Lakes Scheme) 1989	Not Applicable
	(Rural Lands) 2008	Not Applicable
	(SEPP 53 Transitional Provisions) 2011	Not applicable
	(State and Regional Development) 2011	Not applicable
	(Sydney Drinking Water Catchment) 2011	Not Applicable
	(Sydney Region Growth Centres) 2006	Not Applicable
	(Three Ports) 2013	Not Applicable
	(Urban Renewal) 2010	Not Applicable
	(Western Sydney Employment Area) 2009	Not Applicable
	(Western Sydney Parklands) 2009	Not Applicable

See Table 5 below which reviews the consistency with the formerly named State Regional Environmental Plans, now identified as deemed SEPPs.

Table 5 - Consistency with deemed State Environmental Planning Policies

No.	Title	Consistency with Planning Proposal
8	(Central Coast Plateau Areas)	Not Applicable
9	Extractive Industry (No.2 – 1995)	Not applicable
16	Walsh Bay	Not applicable
18	Public Transport Corridors	Repealed
19	Rouse Hill Development Area	Repealed
20	Hawkesbury-Nepean River (No.2 – 1997)	Not Applicable
24	Homebush Bay Area	Not Applicable
26	City West	Not Applicable
30	St Marys	Not Applicable
33	Cooks Cove	Not Applicable
	(Sydney Harbour Catchment) 2005	Not applicable

Question 6: Is the planning proposal consistent with applicable Ministerial Directions (s.117 directions)?

See Table 6 below which reviews the consistency with the Ministerial Directions for LEPs under section 117 of the *Environmental Planning and Assessment Act 1979*.

Table 6 - Consistency with applicable Ministerial Directions

1. Employment and Resources

No.	Title	Consistency with Planning Proposal
1.1	Business and Industrial Zones	Not Applicable
1.2	Rural Zones	Not Applicable
1.3	Mining, Petroleum Production & Extractive Industries	Not Applicable
1.4	Oyster Aquaculture	Not Applicable
1.5	Rural Lands	Not Applicable

2. Environment and Heritage

No.	Title	Consistency with Planning Proposal
2.1	Environmental Protection Zones	Not Applicable
2.2	Coastal Protection	Not Applicable
2.3	Heritage Conservation	Not Applicable
2.4	Recreation Vehicle Areas	Not Applicable

3. Housing, Infrastructure and Urban Development

No.	Title	Consistency with Planning Proposal
3.1	Residential Zones	Consistent
3.2	Caravan Parks and Manufactured Home Estates	Not Applicable
3.3	Home Occupations	Not Applicable
3.4	Integrating land use and Transport	Consistent
3.5	Development near Licensed Aerodromes	Not Applicable
3.6	Shooting ranges	Not Applicable

4. Hazard and Risk

No.	Title	Consistency with Planning Proposal
4.1	Acid Sulfate Soils	Consistent
4.2	Mine Subsidence and Unstable Land	Not Applicable
4.3	Flood Prone Land	Consistent
4.4	Planning for Bushfire Protection	Not Applicable

5. Regional Planning

No.	Title	Consistency with Planning Proposal
5.1	Implementation of Regional Strategies	Not Applicable
5.2	Sydney Drinking Water Catchments	Not Applicable
5.3	Farmland of State and Regional Significance on the NSW Far North Coast	Not Applicable
5.4	Commercial and Retail Development along the Pacific Highway, North Coast	Not Applicable
5.5	Development on the vicinity of Ellalong…	Not Applicable
5.6	Sydney to Canberra Corridor	Not Applicable
5.7	Central Coast	
5.8	Second Sydney Airport: Badgerys Creek	Not Applicable

6. Local Plan Making

No.	Title	Consistency with Planning Proposal

6.1	Approval and Referral Requirements	Consistent
6.2	Reserving land for Public Purposes	Not Applicable
6.3	Site Specific Provisions	Not Applicable

7. Metropolitan Planning

No.	Title	Consistency with Planning Proposal
7.1	Implementation of A Plan for Growing Sydney	Consistent

C Environmental, social and economic impact

Question 7: Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

No impacts arise from the planning proposal as the site does not contain critical habitat, threatened species, populations or ecological communities.

Question 8: Are there any other likely environmental effects as a result of the planning proposal and how they might be managed?

The key characteristics of the site are:

- The subject site is not identified as being of heritage significance.
- The site is not located within a heritage conservation area.
- The subject site does not contain significant vegetation or critical habitat.
- The subject site is not near a natural water course. Some overland flooding is identified across certain lots in the street block however such does not constitute an impediment to redevelopment.
- The site is not within a bushfire hazard area.
- The subject site is not potentially affected by acid sulphate soils.
- The subject site will require the decommissioning of a redundant service station however contamination is not a constraint restricting development of the site.

An expert report addressing contamination has been prepared supporting the planning proposal. The subject site can be suitably developed to provide co-ordinated and safe vehicle access and the development is likely have a reduced traffic generation than the current uses on-site.

An expert report addressing flooding and stormwater management plan has been prepared supporting the planning proposal.

Question 9: Has the planning proposal adequately addressed any social or environmental impacts?

Potential flood and acid sulphate soil impacts have been adequately addressed in previous reporting and Council assessments. The urban design aspects of the proposed redevelopment have been addressed in the architects design statement. The planning proposal promotes the aims and objectives of the strategic framework as detailed in section 3.4 of this report. Section 3.3.3 of this report canvasses the community benefits of the development. There are no additional matters or likely impacts specific to the site.

D State and Commonwealth interests

Question 10: Is there adequate public infrastructure for the planning proposal?

All utility services (telephone, electricity, sewer and water) are available to the site. A Voluntary Planning Agreement is proposed to be prepared addressing local service and facility provision including contributions towards improvements to the open space parcels within the street block and possible provision of new pedestrian footpaths providing better pedestrian connectivity to the site from the town centre.

The road network has the capacity to accommodate the proposed densities.

Question 11: What are the views of State and Commonwealth public authorities consulted in accordance with the gateway determination?

There has been no consultation at this point. The planning proposal does not raise any matters of State and Commonwealth significance beyond the matters addressed in this report. If any additional matters are identified in the gateway determination then they will be addressed at that point.

Part 4 – Mapping

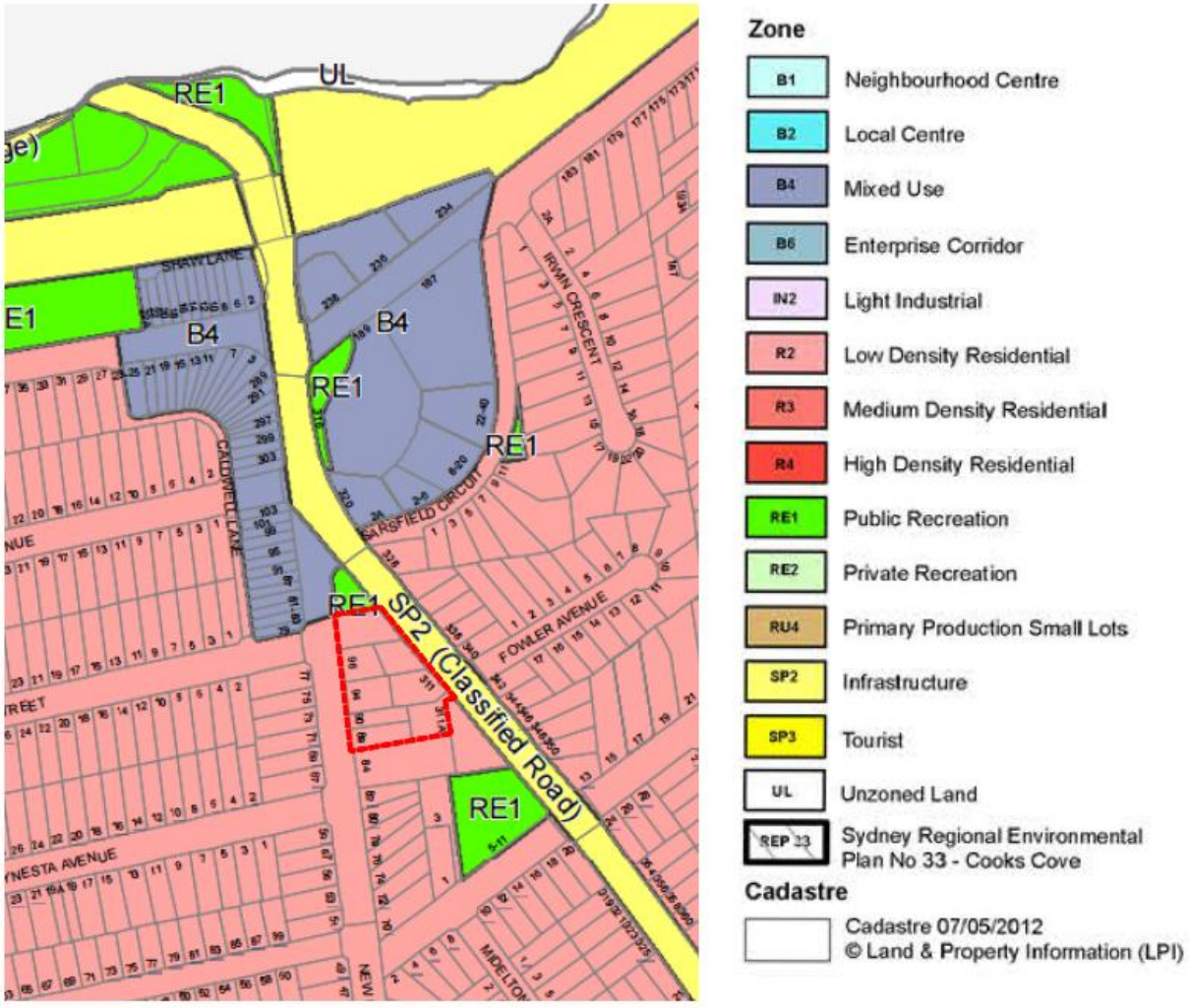
The following mapping documents have been prepared in support of the planning proposal:

- site identification maps including aerial photographs of the site and its context (sections 3.1.1 and 3.1.2 of this report).
- current and proposed development standards relating to the land – zoning, FSR, and building height (section 3.2.2 of this report).
- plans of the proposed redevelopment of the site.

Site Context Map

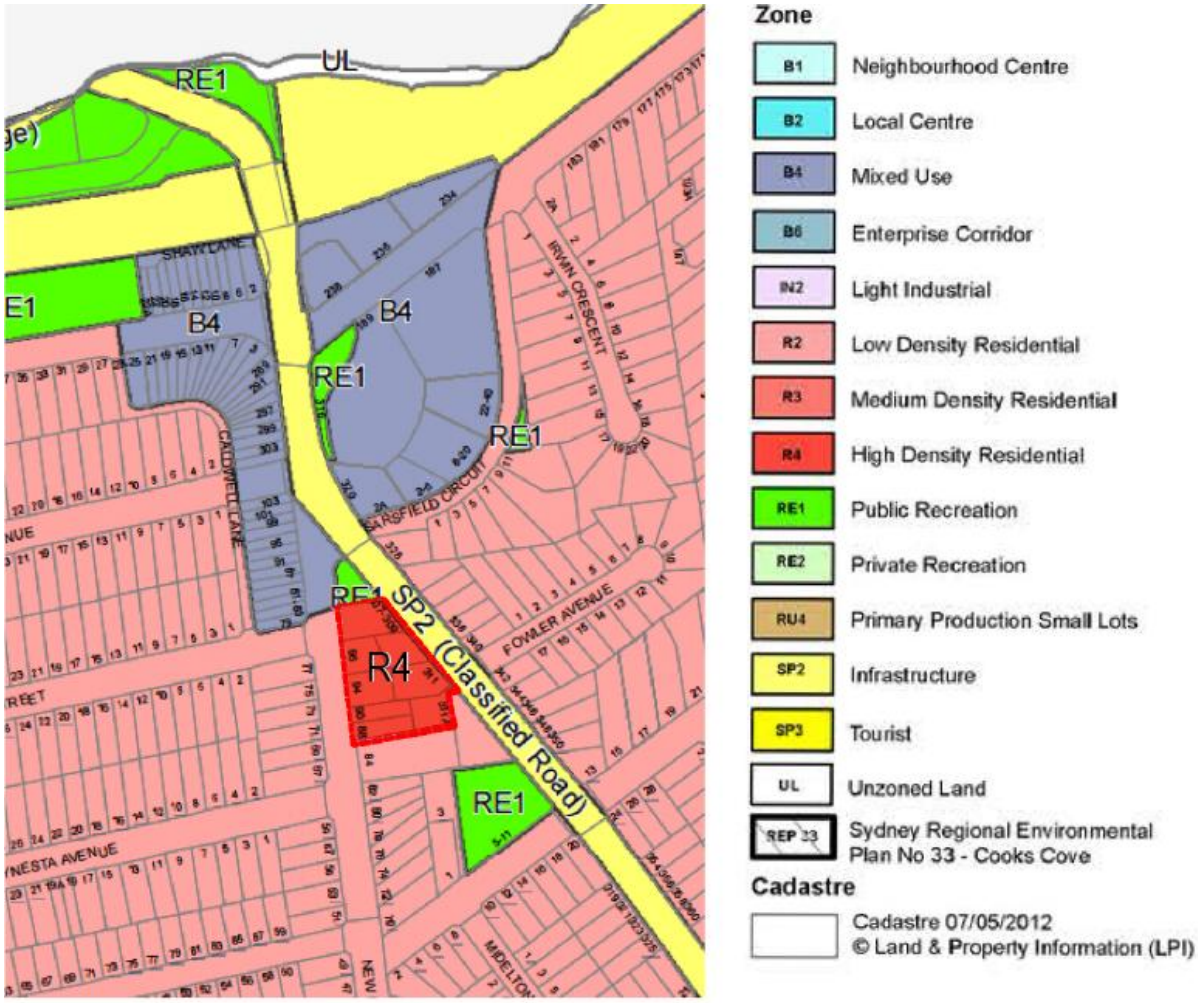
Maps 1 to 6 illustrate the current control maps as well as proposed controls. Specifically, the zoning, height of building and floor space ratio are proposed to be modified by this planning proposal.

Map 1 below shows the current land zoning control as per **Rockdale LEP 2011.**



Map 1: Current Land Zoning Control (R2 – Low Density Residential)

Map 2 below shows the proposed land zoning control.

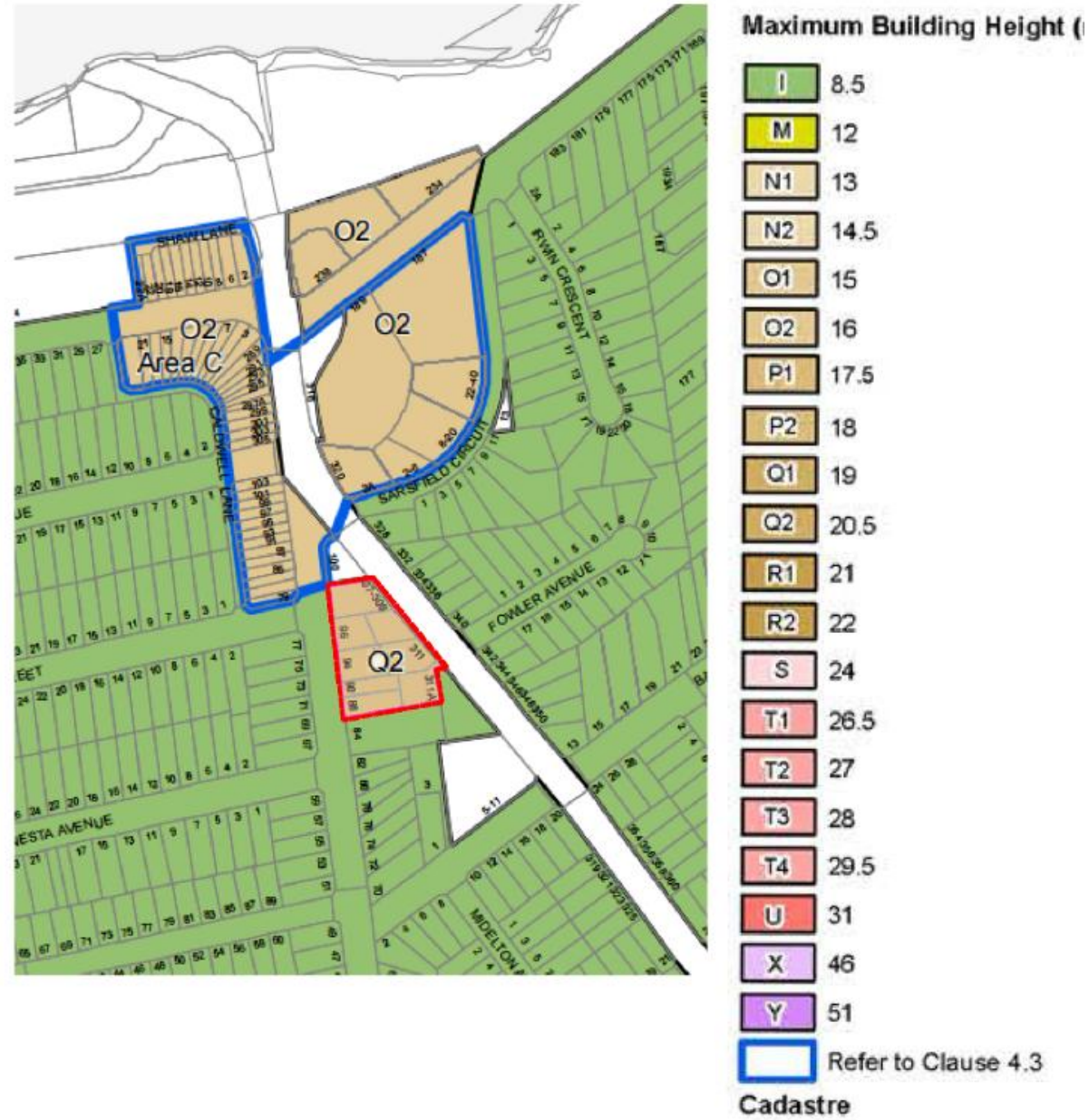


Map 2: Proposed Land Zoning Control (R4 – High Density Residential)

Map 3 below shows the current maximum building height control as per Rockdale LEP 2011.

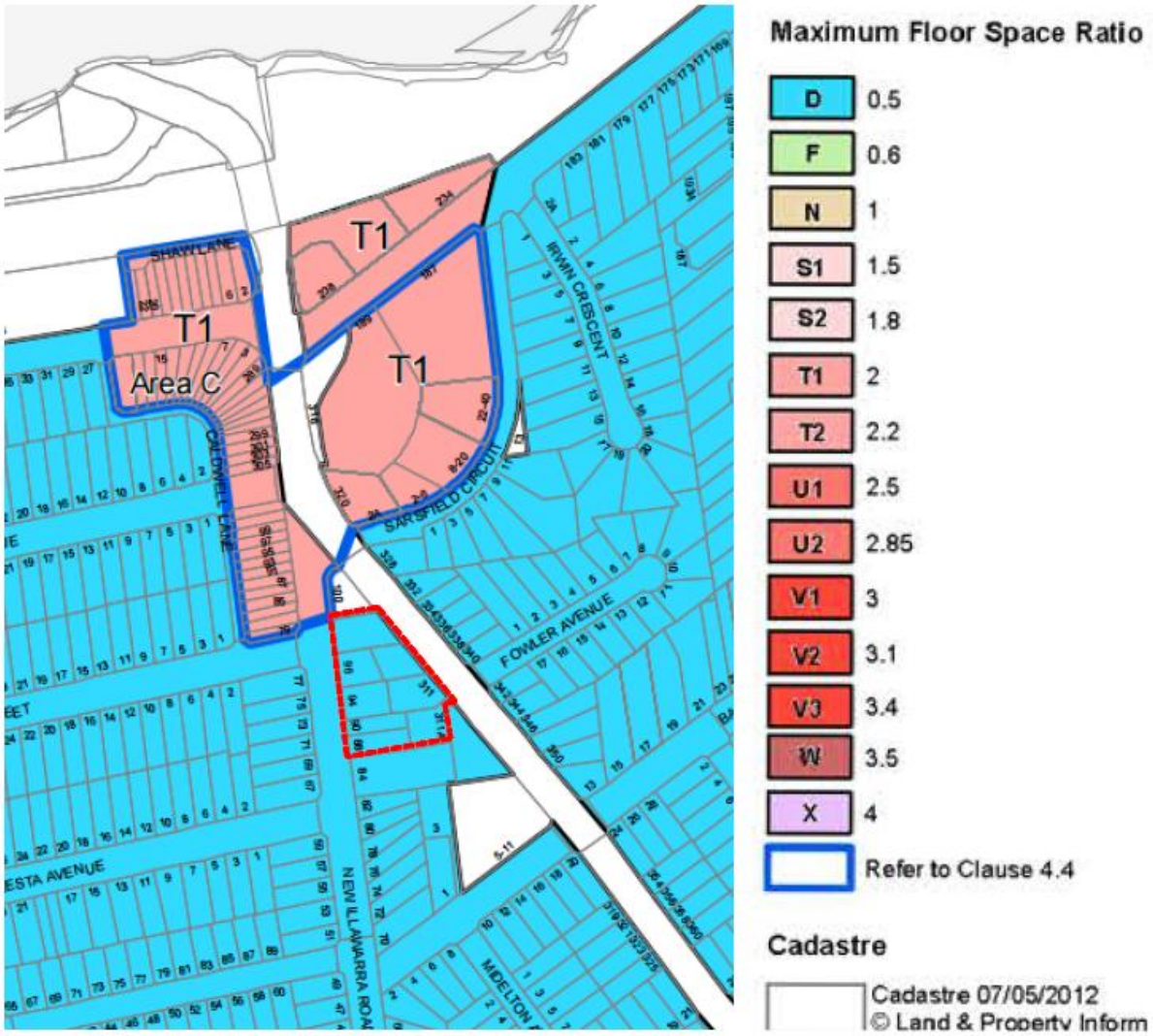
Map 3: Current Height Control (I – 8.5m)

Map 4 below shows the proposed maximum building height control.



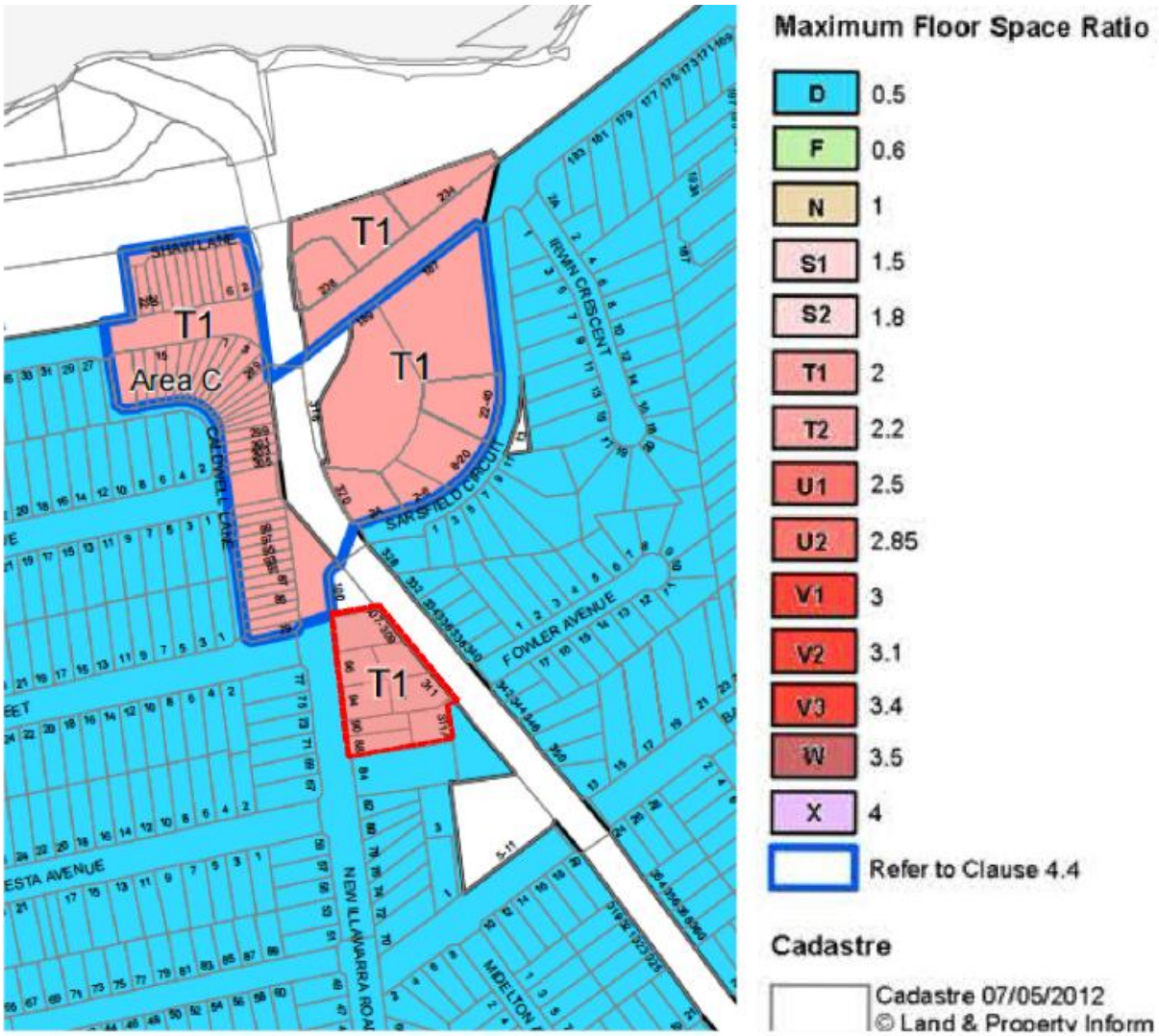
Map 4: Proposed Maximum Height Control (Q2 – 20.5m)

Map 5 below shows the current floor space ratio control as per Rockdale LEP 2011.



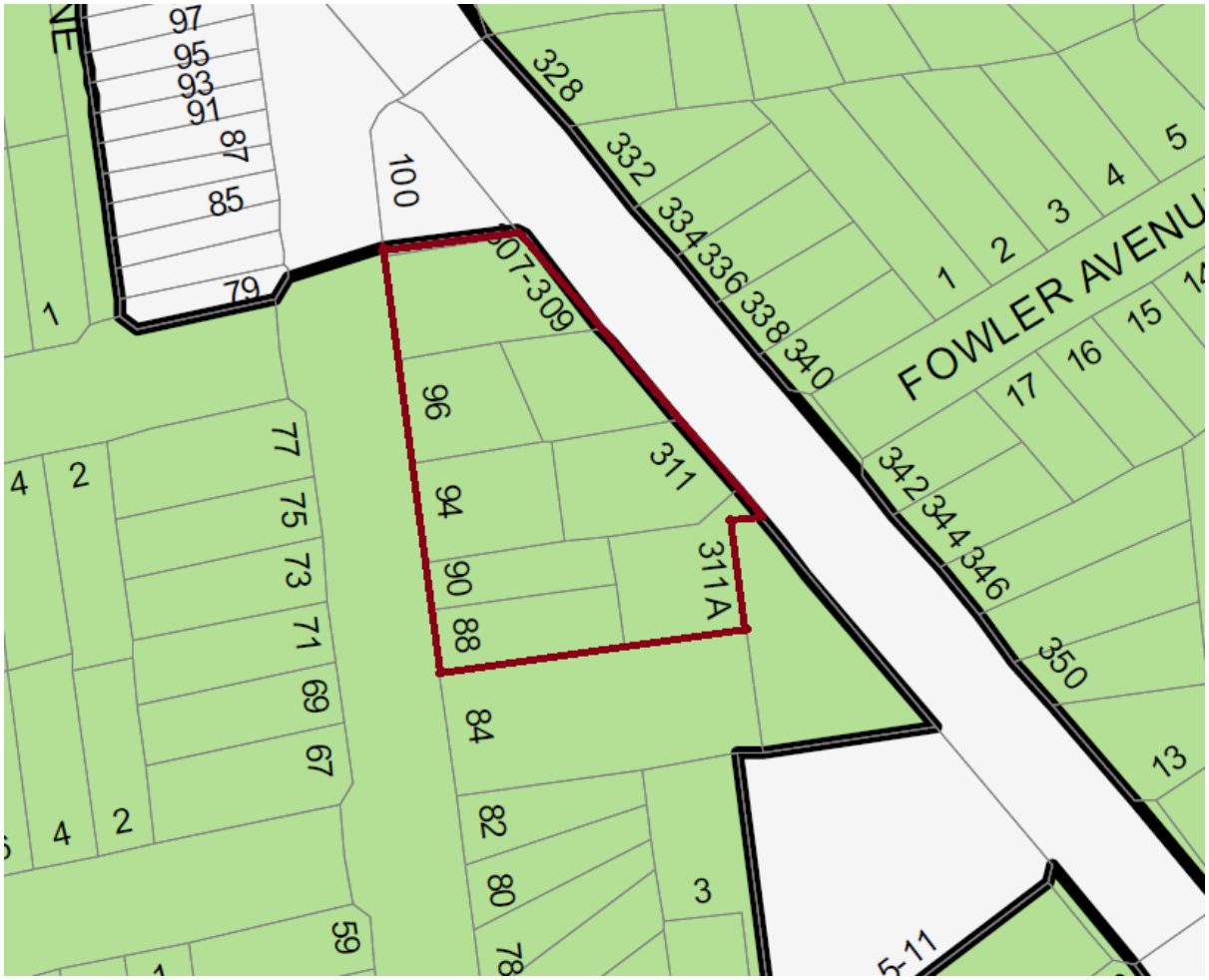
Map 5: Current Floor Space Ratio Control (D – 0.5:1)

Map 6 below shows the proposed floor space ratio.



Map 6: Proposed Floor Space Ratio Control (T1 – 2:1)

Map 7 below shows the current Lot Size map as per Rockdale LEP 2011.



Map 7: Current Lot Size Map

Map 8 below shows the removal of a lot size applicable to the site.

Part 5 - Community Consultation

In preparing the planning proposal the applicant has consulted with senior officers from Rockdale City Council.

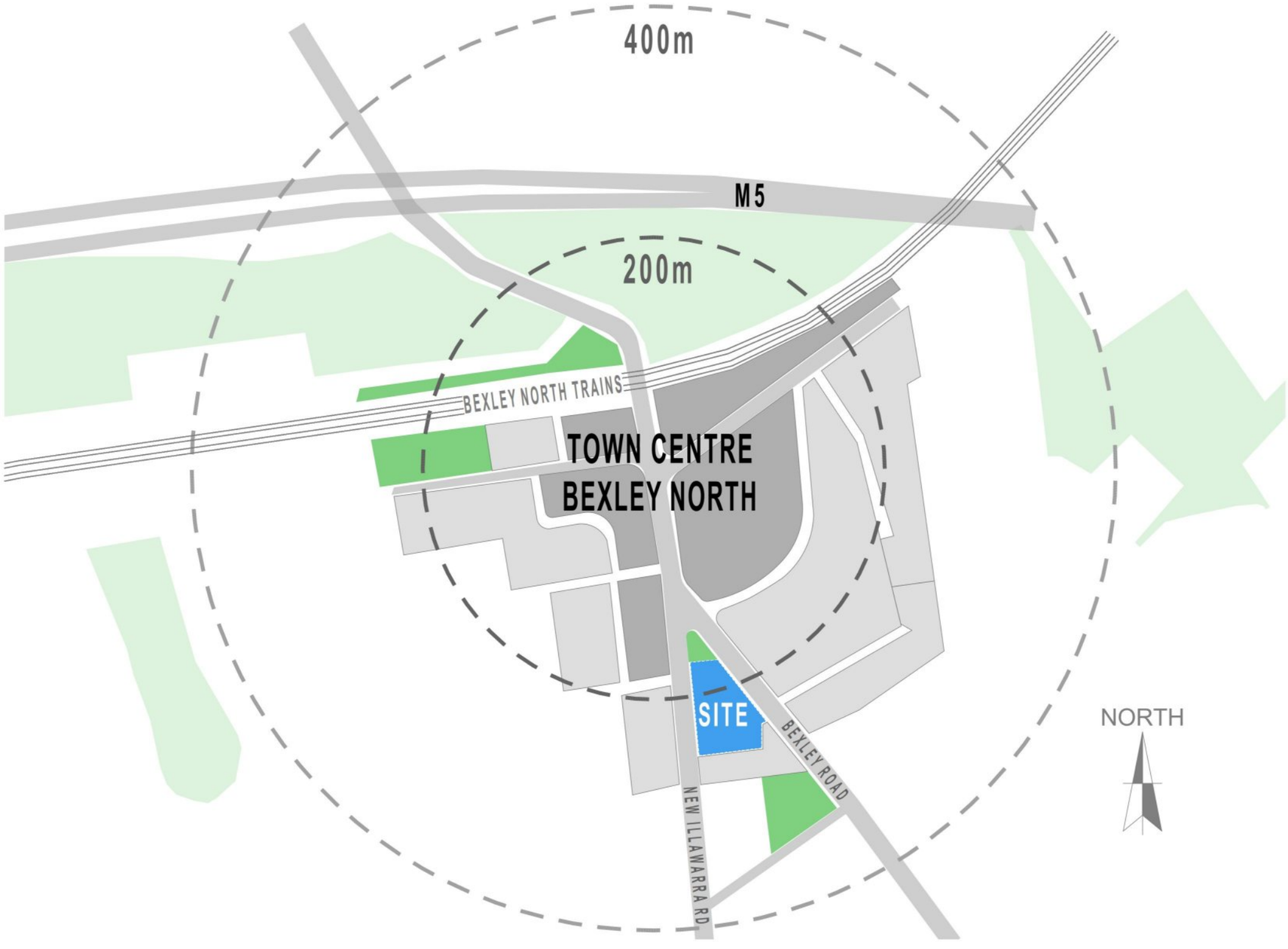
The Gateway determination will confirm the extent of public consultation that must be undertaken in respect of the planning proposal. The Gateway will also confirm the scope of additional information that may be required and the range of agencies to be consulted. This part of the proposal will be revised to reflect the consultation requirements specified in the determination.

Part 6 – Project Timeline

Anticipated commencement date (date of Gateway determination)	July 2017
Anticipated timeframe for the completion of required technical information	August 2017
Timeframe for government agency consultation (pre and post exhibition as required by Gateway determination)	August - September 2017
Commencement and completion dates for public exhibition period	September 2017
Dates for public hearing (if required)	October 2017
Timeframe for consideration of submissions	October-November 2017
Timeframe for the consideration of a proposal post exhibition	December 2017
Date of submission to the department to finalise the LEP	January 2018
Anticipated date RPA will make the plan (if delegated)	January 2018
Anticipated date RPA will forward to the department for notification.	January 2018

PLANNING PROPOSAL DESIGN

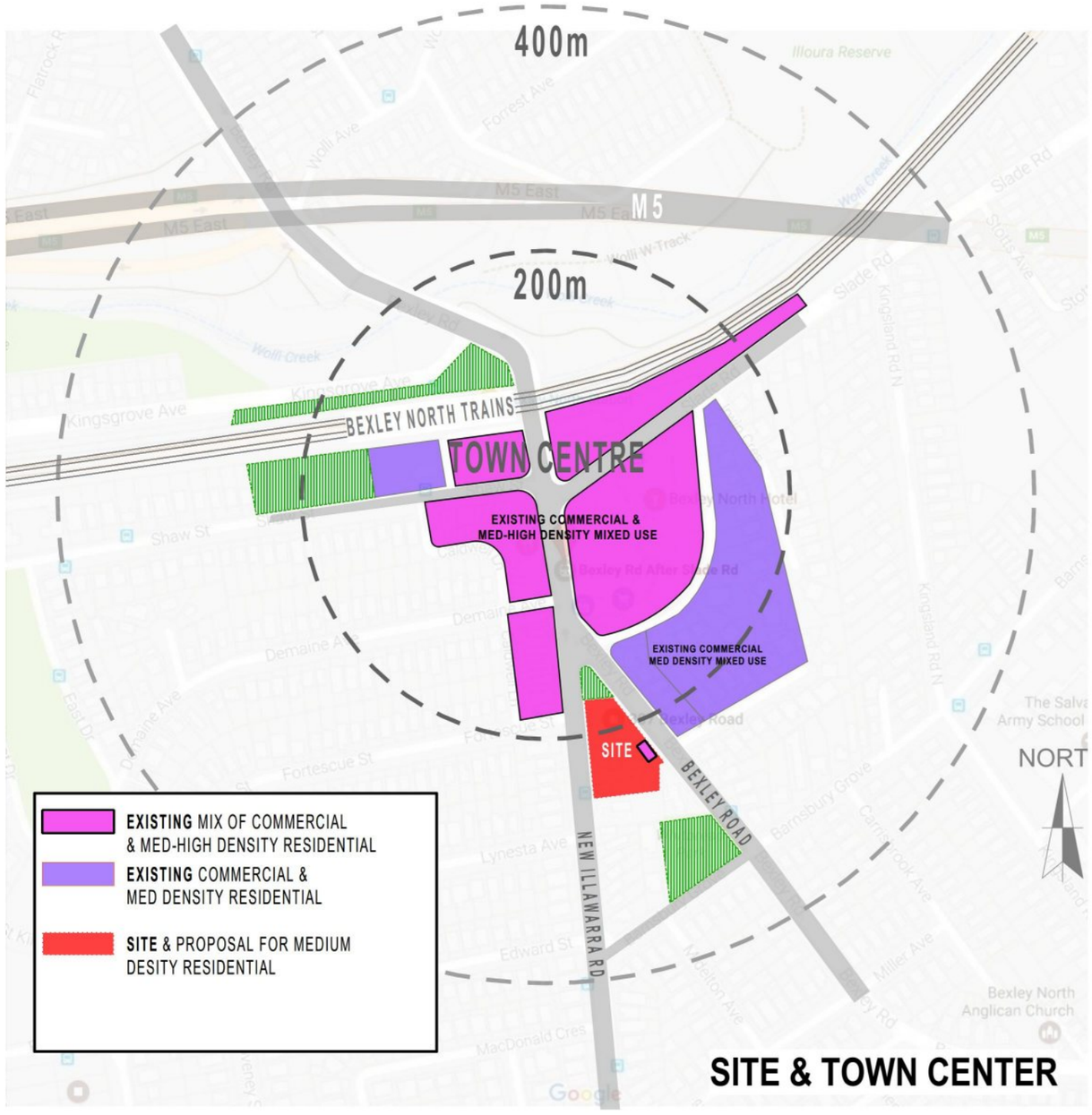
88-96 NEW ILLAWARRA RD & 307-311A BEXLEY ROAD, BEXLEY NORTH



URBAN LINK

21/02/2018

01 COVER PAGE



SITE CONTEXT: CURRENT LEP

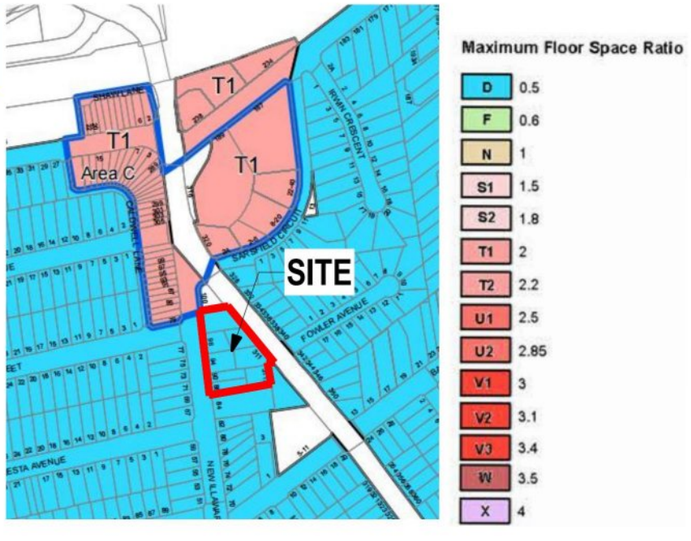
Under the current LEP the site is excluded from the town center zoning in relation to FSR and building height. A simple overview of these plans shows that the proposed site should be included within the town centre zoning. Shadow studies also show that there is no adverse impact if the site is zoned similar to the rest of the town center.

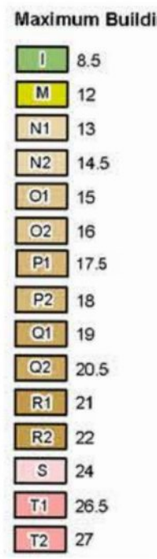
Furthermore the future growth of Bexley North will require these areas be the first to have increased density. There is already an application from the Department of Housing for 3-4 storey residential flat buildings on 84 New Illawarra Rd & 313 Bexley Rd.

EXISTING PLANNING CONTROLS
LEP - LAND USE ZONING

EXISTING PLANNING CONTROLS
LEP - HEIGHT OF BUILDING

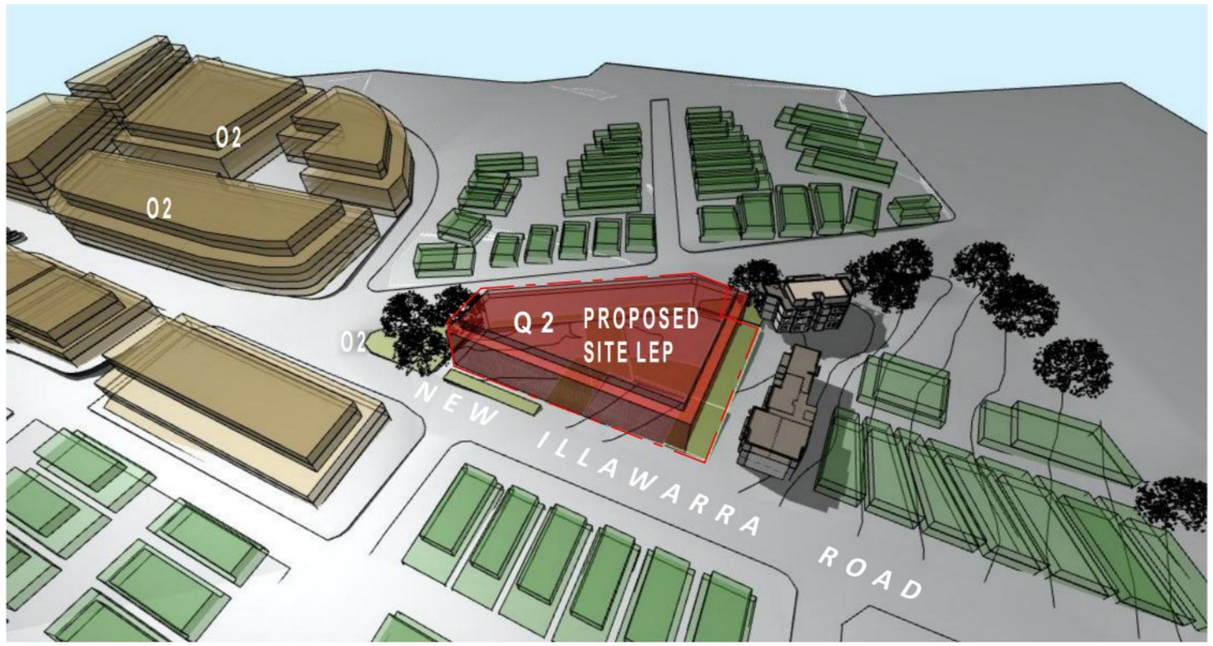
EXISTING PLANNING CONTROLS
LEP - FLOOR SPACE RATIO





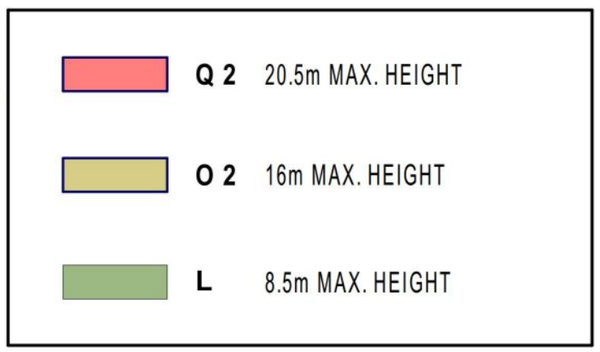
EXISTING LEP

PROPOSED LEP [HOB] - Q2



EXISTING PLANNING CONTROLS
LEP - HEIGHT OF BUILDING ZONES

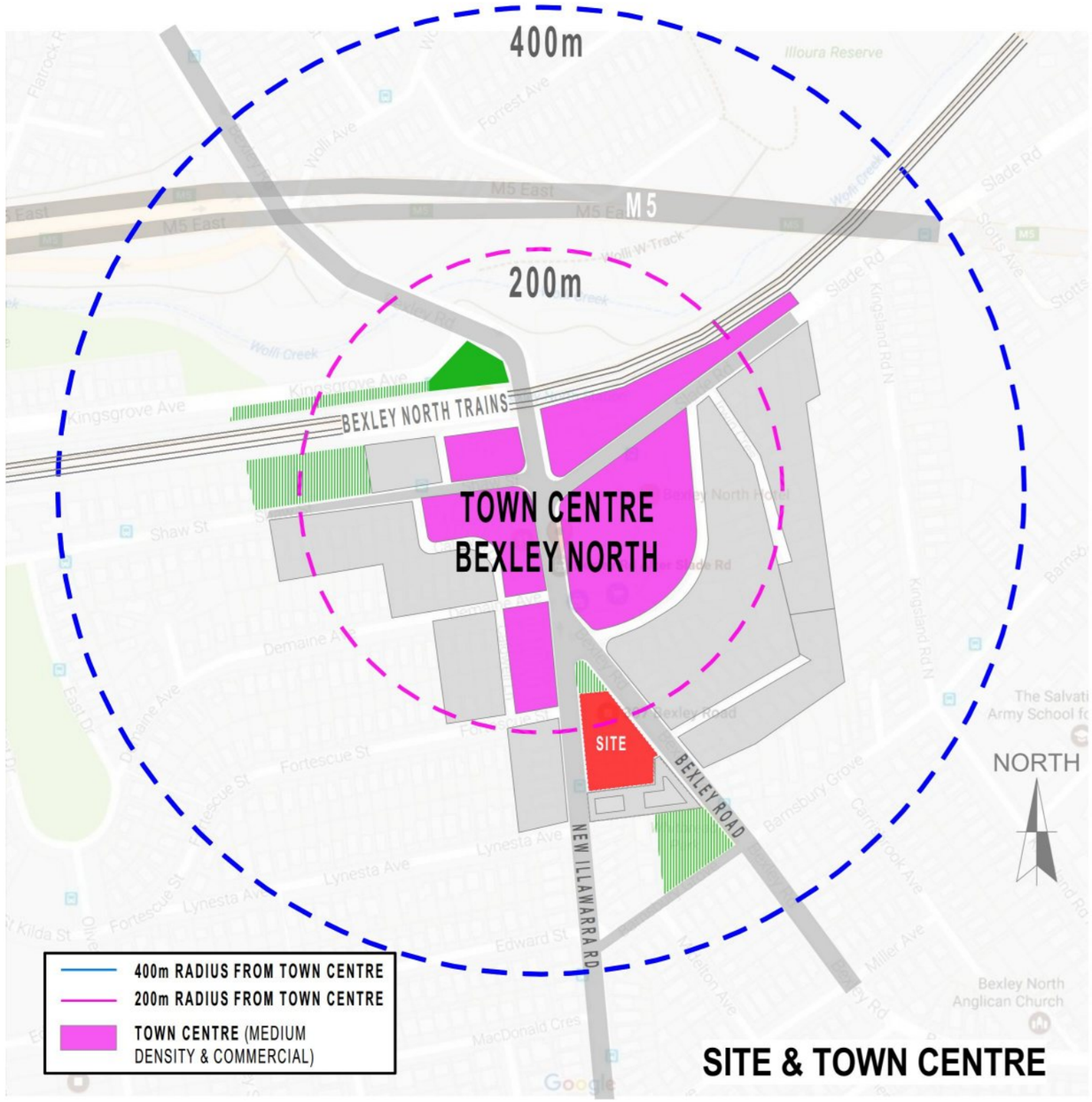
PROPOSED PLANNING CONTROLS
LEP - HEIGHT OF BUILDING ZONES



SITE CONTEXT: CURRENT LEP

Under the current LEP the site is excluded from the town center zoning in relation to FSR and building height. A simple overview of these plans shows that the proposed site should be included within the town centre zoning. Shadow studies also show that there is no adverse impact if the site is zoned similar to the rest of the town center.

Furthermore the future growth of Bexley North will require these areas be the first to have increased density. There is already an application from the Department of Housing for 3-4 storey residential flat buildings on 84 New Illawarra Rd & 313 Bexley Rd.

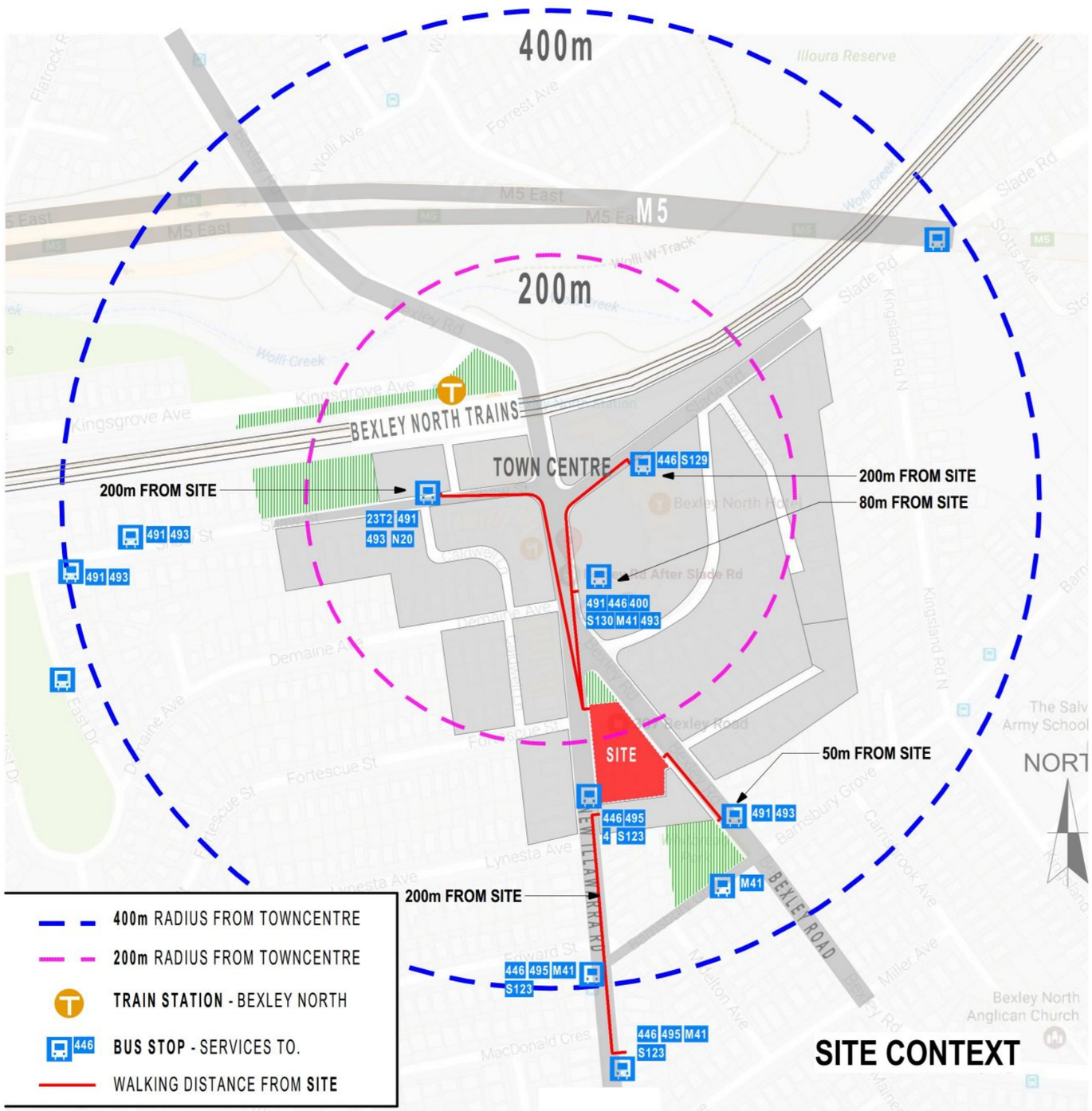


PROPOSED SITE & TOWN CENTER PROXIMITY

The subject site is located withing close proximity of other medium density sites and commcerical centers that are part of the town centre. The site is situated in very critical location and has to potential to complete the towncenter circle.

Like the majority of suburbs in Sydney, Bexley too has seen growth and therefore the need for more residential, retail and commercial developments that meet these needs.

On the next page these areas are clear indicated with photo references to clarify the sites significance as part of the town centre.



DISTANCE TO PUBLIC TRANSPORT

The Subject Site enjoys exceptional public transport connections to major Office, Commercil, Retail and Educational Centres all within ONLY 200m.

<u>Rail</u>

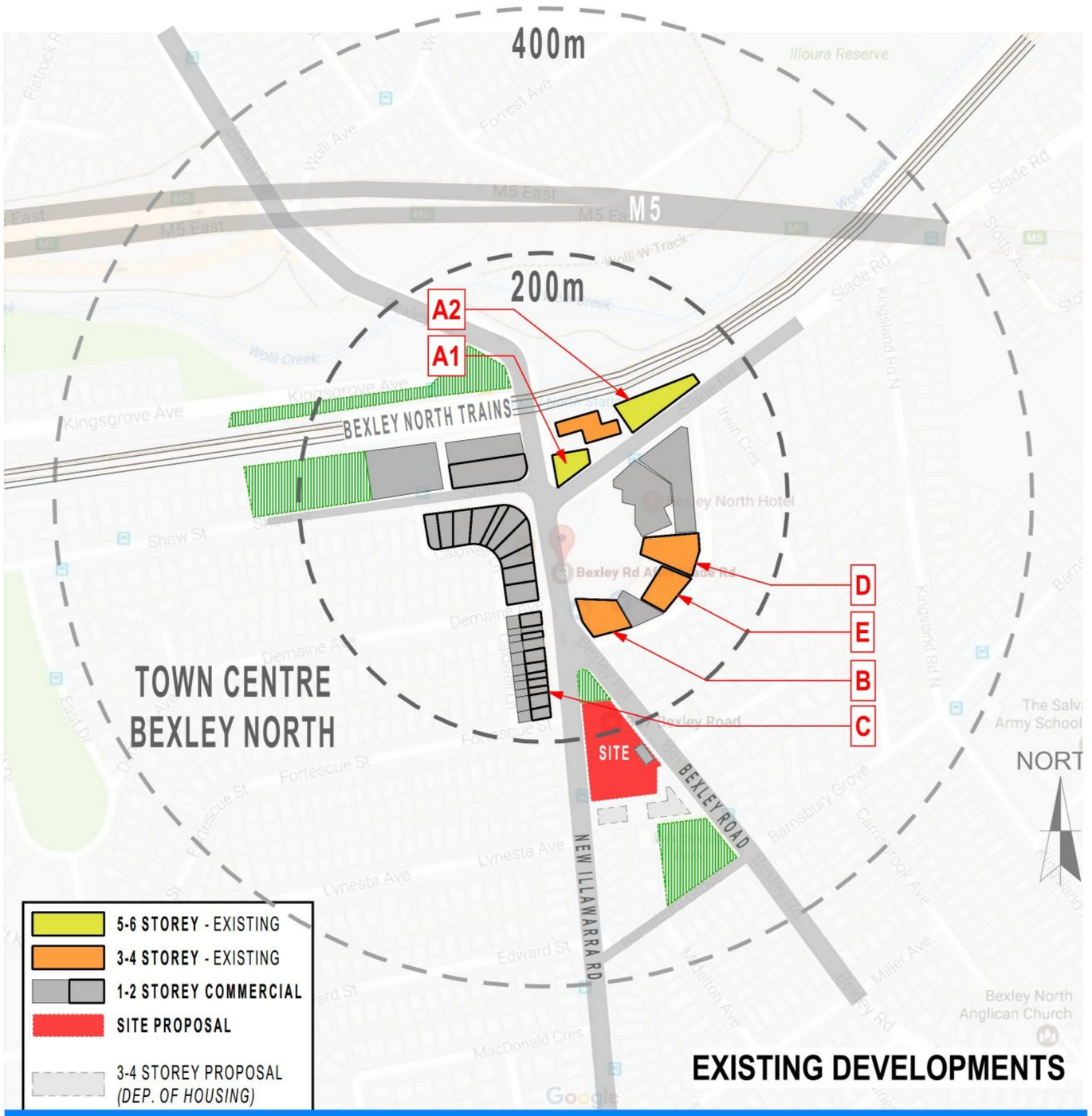
200m to Bexley North Train station - Which allows direct trains to Central Station & Revesby and all other stations Via the T2 Airport Line.

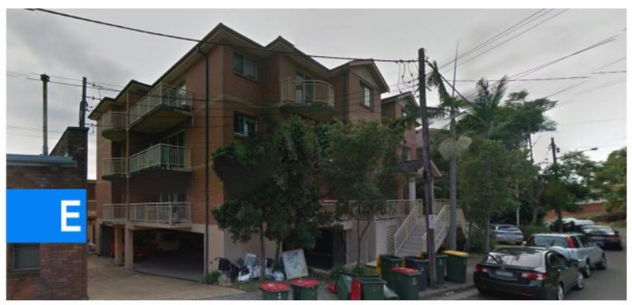
Bus Service on New Illawarra Rd
Husrtvill, Kingsgrove, Kograh, Roselands (Including stops to suburbs in between)

<u>Bus Services on Bexley Rd</u>

200m to Bus Stop for Routes M41, 400, 491, 493.
Connections to Hurstville, Bondi Junction, Five Dock, Earlwood, Burwood, Roselands (Including stops to suburbs in between).

The proposed development will be a Transit Oriented Development.
“Transit Oriented Development is a planning concept that promotes high quality, medium to high density mixed use development within a comfortable ten minute walk of established or planned rail and bus-way stations (a radius of about 800 metres).” (Transport for NSW)

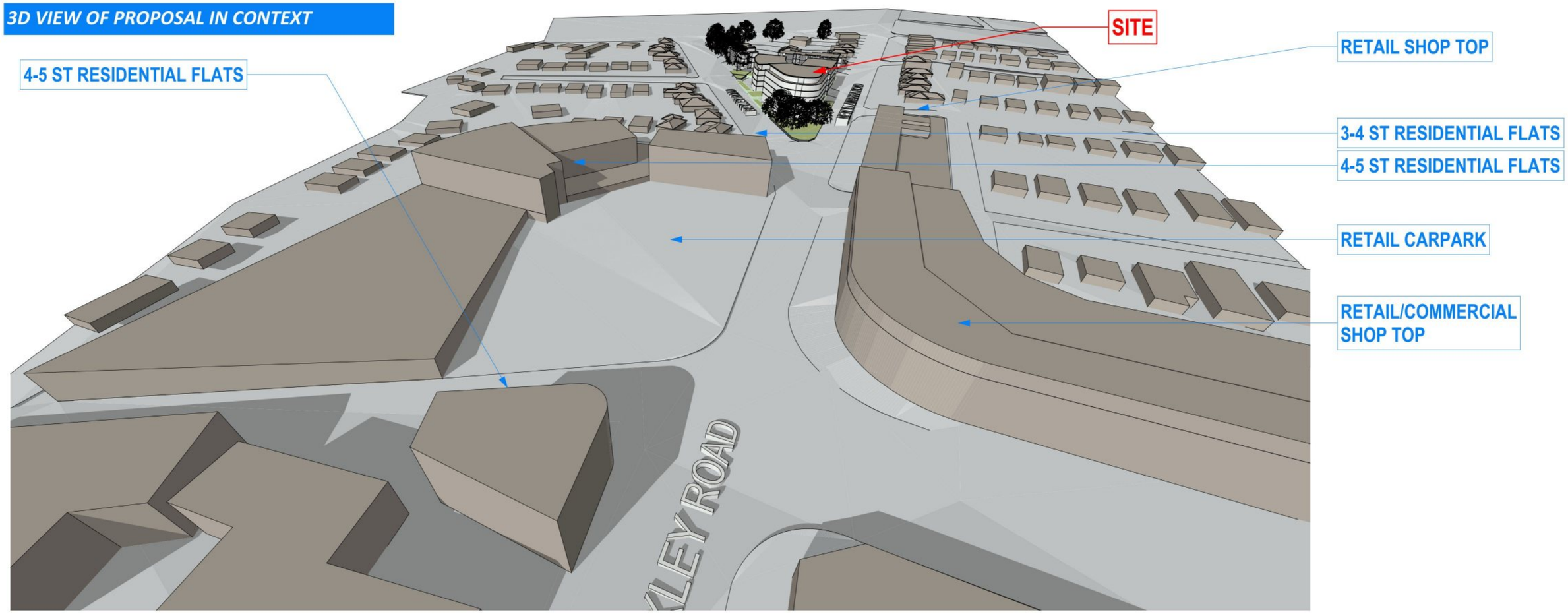




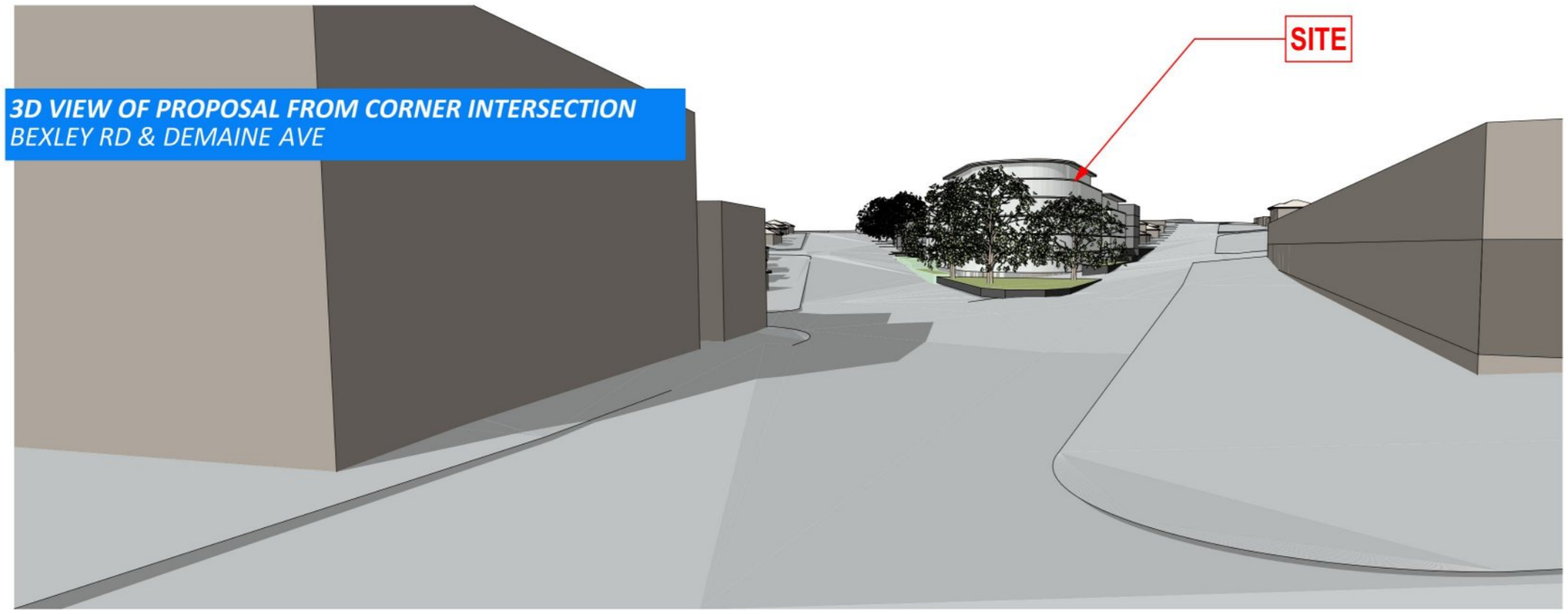
EXISTING CONTEXT & DEVELOPMENTS

As shown in the diagram above the proposed site is surround by by commercial buildings and medium density residential buildings including a service station on the site itself. It is therefore quite reasonable that the site should be part of this "town centre" zoning that would allow a development that is in keeping with the surrounding context and future potential to meet the needs of the Bexley North community.

3D VIEW OF PROPOSAL IN CONTEXT



3D VIEW OF PROPOSAL FROM CORNER INTERSECTION
BEXLEY RD & DEMAINE AVE



PROPOSED BUILDING SETBACKS - 1:400

BEXLEY ROAD

NORTH

4 STOREY
PROPOSED DEPARTMENT OF HOUSING
RES. FLAT BUILDING

5 STOREY
499 m²

6 STOREY
789 m²

5 STOREY
443 m²

3 STOREY
PROPOSED DEPARTMENT OF HOUSING
RES. FLAT BUILDING

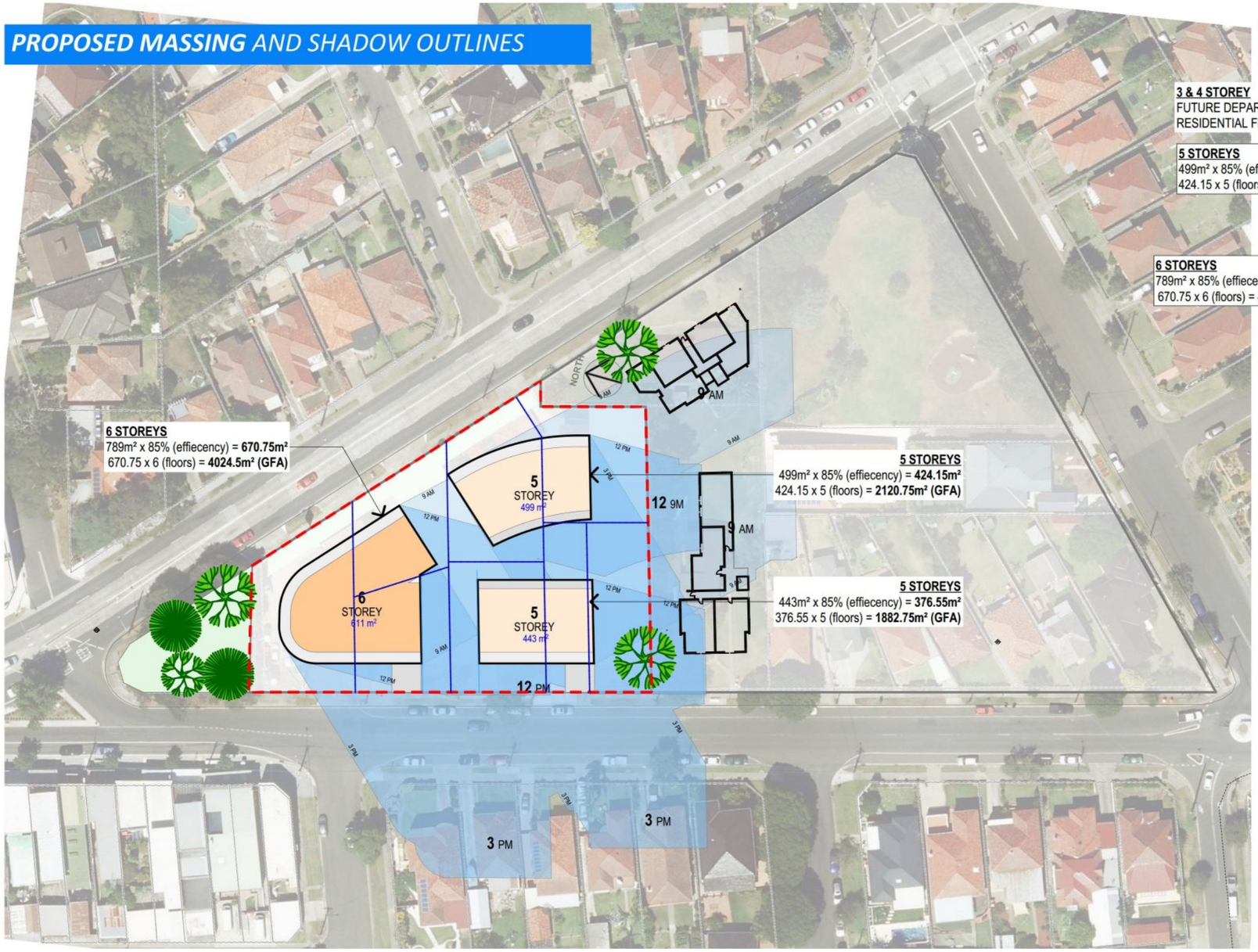
PARK

6,000
12,000
18,000
15,000

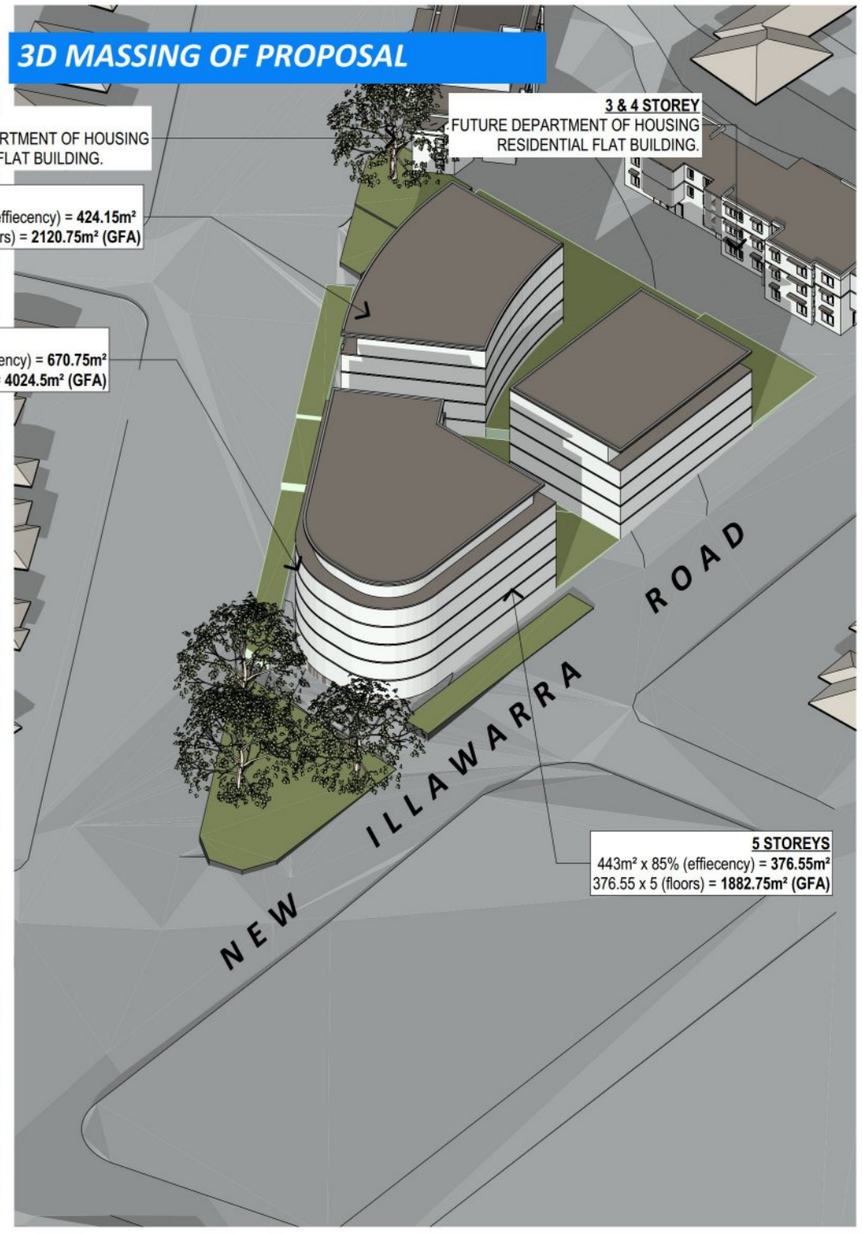
NEW ILLAWARRA ROAD

08 PROPOSAL: SETBACKS

PROPOSED MASSING AND SHADOW OUTLINES



3D MASSING OF PROPOSAL



PROPOSED MASSING

The proposed massing on the site is three residential flat buildings that are organised into the shape of the site and with consideration to vehical entry points and amenity to the residents and neighbours.

Our proposal allows generous setbacks to minimise overshadowing and maximise amenity and to provide a transition between the town center and R2 residential zoning.

FSR & GFA DIAGRAM

SITE A: **1,693m²**

GFA : = **3121.2m²**
FSR : 4023.9 / 1693
= 1.85 : 1

SITE B: **2,564m²**

GFA : 1882.75+2120.75
= 4003.5m²
FSR : 4003.5 / 2564
=1.56 : 1

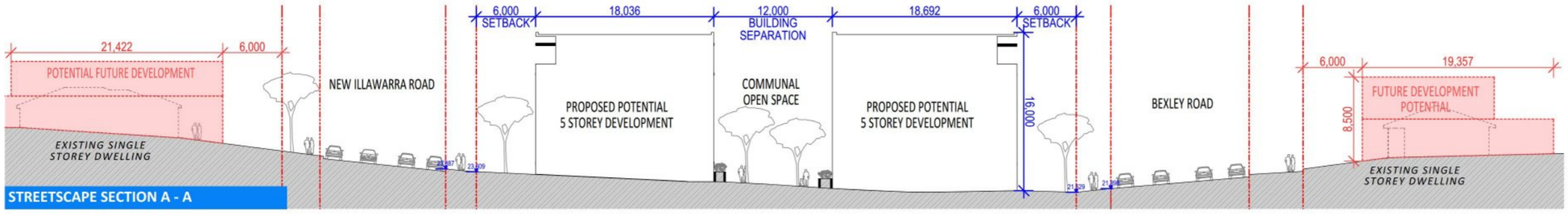
LANDSCAPE & DEEP SOIL DIAGRAM

SITE A -DEEP SOIL AREA : **762m²** OR **45%**

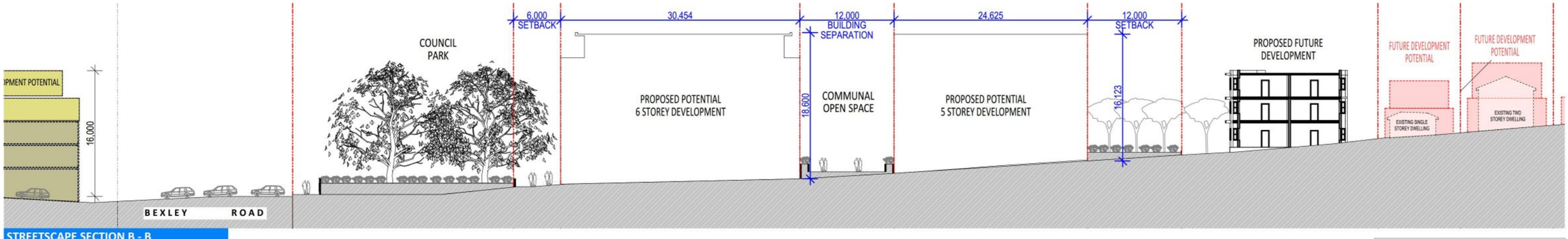
SITE B -DEEP SOIL AREA : **1326m²** OR **51%**

TOTAL DEEP SOIL AREA: 2,088 m²

KEY MAP



STREETSCAPE SECTION A - A



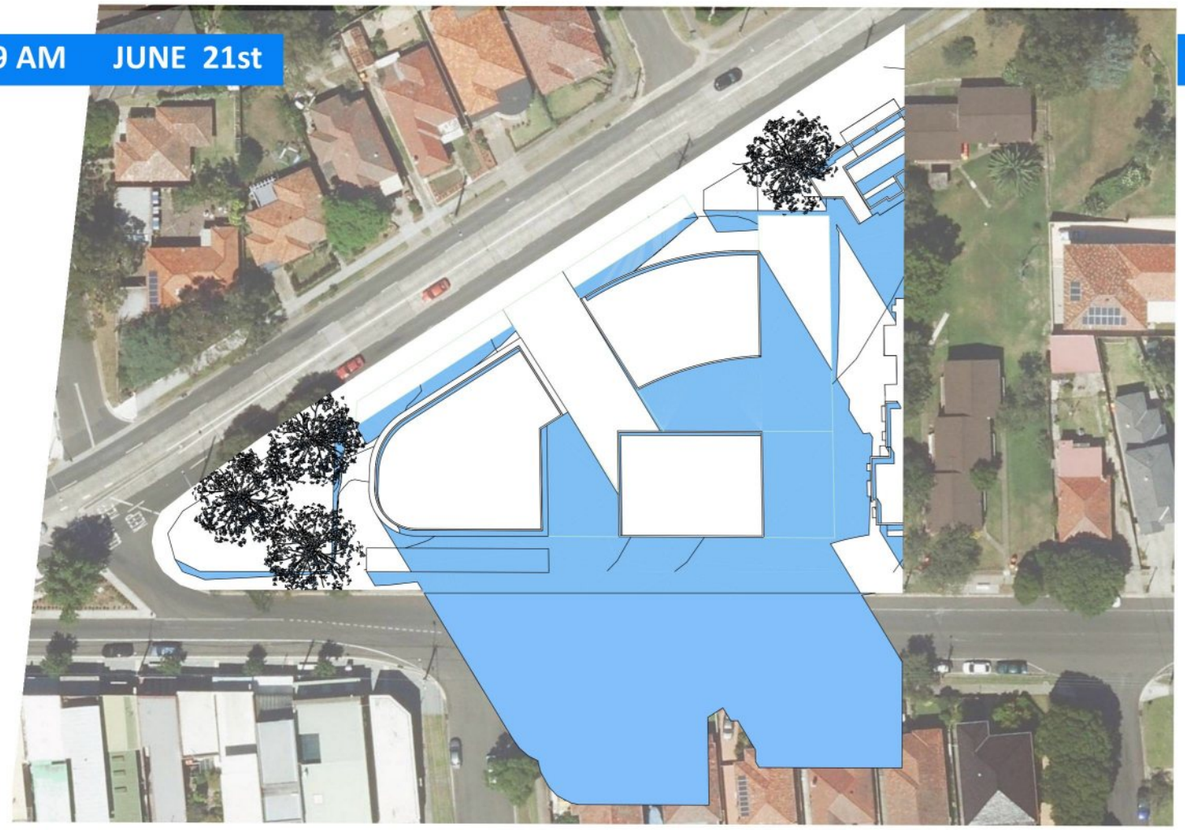
STREETSCAPE SECTION B - B

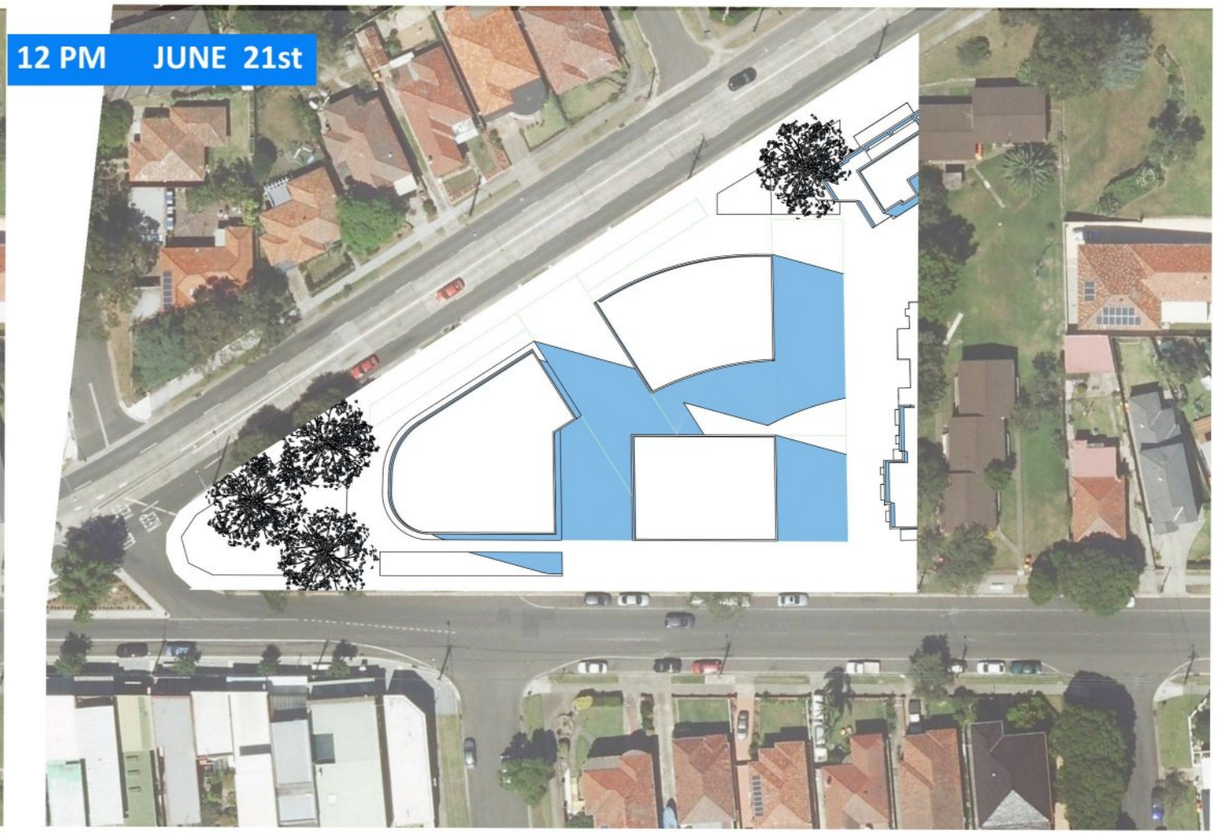
BASEMENT PLAN & DRIVEWAY ENTRY/EXITS

SITE A -DEEP SOIL AREA : **762m²** OR **45%**

SITE B -DEEP SOIL AREA : **1326m²** OR **51%**

TOTAL DEEP SOIL AREA: 2,088 m²

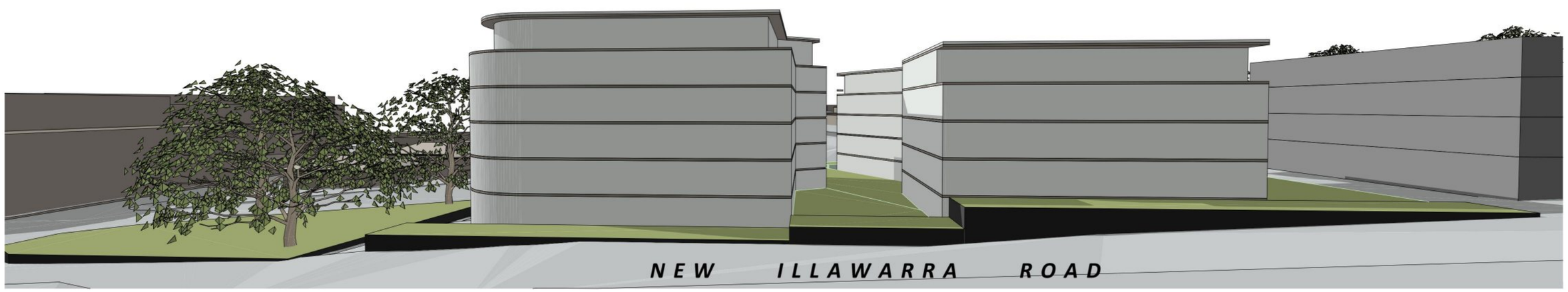




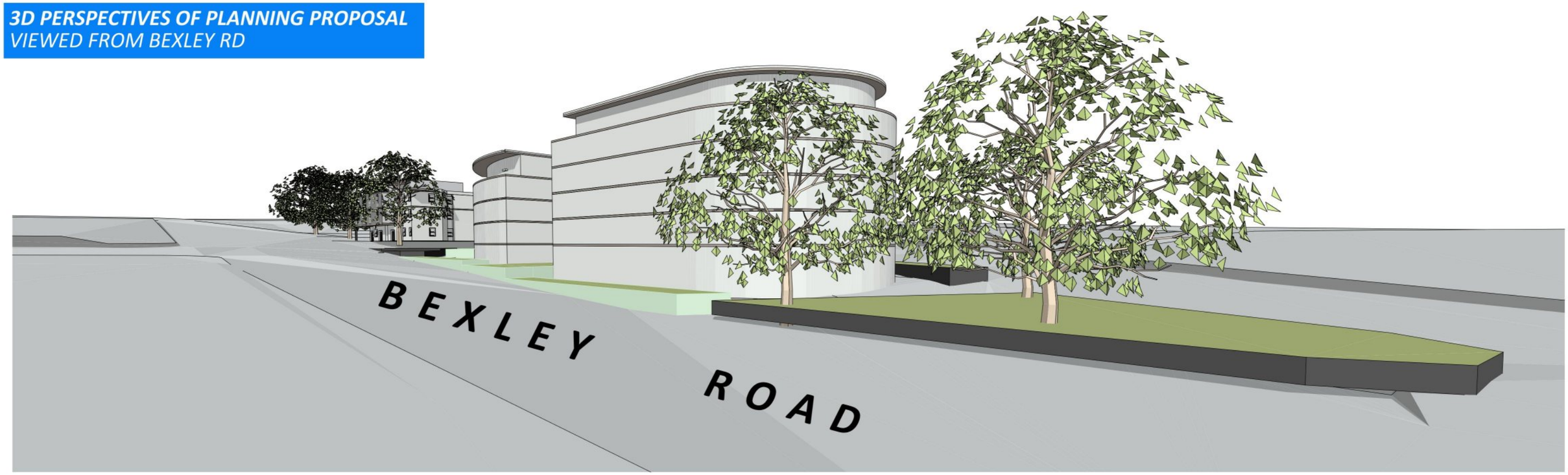
SHADOW DIAGRAMS:
9AM, 12PM & 3PM ON JUNE 21st

OVERVIEW OF PLANNING PROPOSAL
VIEWED FROM ABOVE BEXLEY ROAD

3D PERSPECTIVES OF PLANNING PROPOSAL
VIEWED FROM NEW ILLAWARRA RD



3D PERSPECTIVES OF PLANNING PROPOSAL
VIEWED FROM BEXLEY RD



3D PERSPECTIVES OF PLANNING PROPOSAL
VIEWED FROM NEW ILLAWARRA RD

Planning Proposal for a
Proposed Residential Development

88-96 New Illawarra Road & 307-311A Bexley Road, Bexley North

TRAFFIC AND PARKING ASSESSMENT REPORT

5 April 2017

Ref 17160

VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants

Suite 6, 20 Young Street, Neutral Bay NSW 2089 - PO Box 1868, Neutral Bay NSW 2089 - Ph: 9904 3224

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LIST OF ILLUSTRATIONS

Document Verification

Location:	88-96 New Illawarra Rd & 307-311A Bexley Rd, Bexley North	**Job Number**		17160	
Revision	**Details**	**Prepared**		**Approved**	
		By	**Date**	**By**	**Date**
Final	Final for Submission	RV	5/04/17	RV	5/04/17

1. INTRODUCTION

This report has been prepared to accompany a Planning Proposal to Rockdale City Council for a residential development to be located at 88-96 New Illawarra Road and 307-311A Bexley Road, Bexley North (Figures 1 and 2).

The Planning Proposal involves the rezoning of the land from *R2 – Low Density Residential* to *R4 – High Density Residential.* The site is situated approximately 250m walking distance to the entrance of Bexley North Railway Station and is also accessible by several bus services.

The site is also located in close proximity to a variety of shops and services within the Bexley North town centre. The shops and services are located between the railway station and the subject site, and are therefore readily accessible to residents who may be walking on their way home from the station.

To improve the pedestrian accessibility of the site to the nearby shops, services and railway station, consideration could be given to the installation of a pedestrian refuge island in New Illawarra Road in the vicinity of the Fortescue Street intersection.

In essence, the site is *ideally located* to encourage increased use of public transport and/or walking to the nearby shops and services.

The Planning Proposal envisages the construction of three new five to six-storey residential apartment buildings resulting in a yield of approximately 100 new dwellings.

Off-street parking is to be provided in two separate new basement car parking areas, with the number of spaces to be provided in accordance with Council's requirements. Vehicular access to the site is to be provided via two separate two-way driveways located off New Illawarra Road.

The purpose of this report is to assess the traffic and parking implications of the Planning Proposal and to that end this report:

- describes the site and provides details of the Planning Proposal

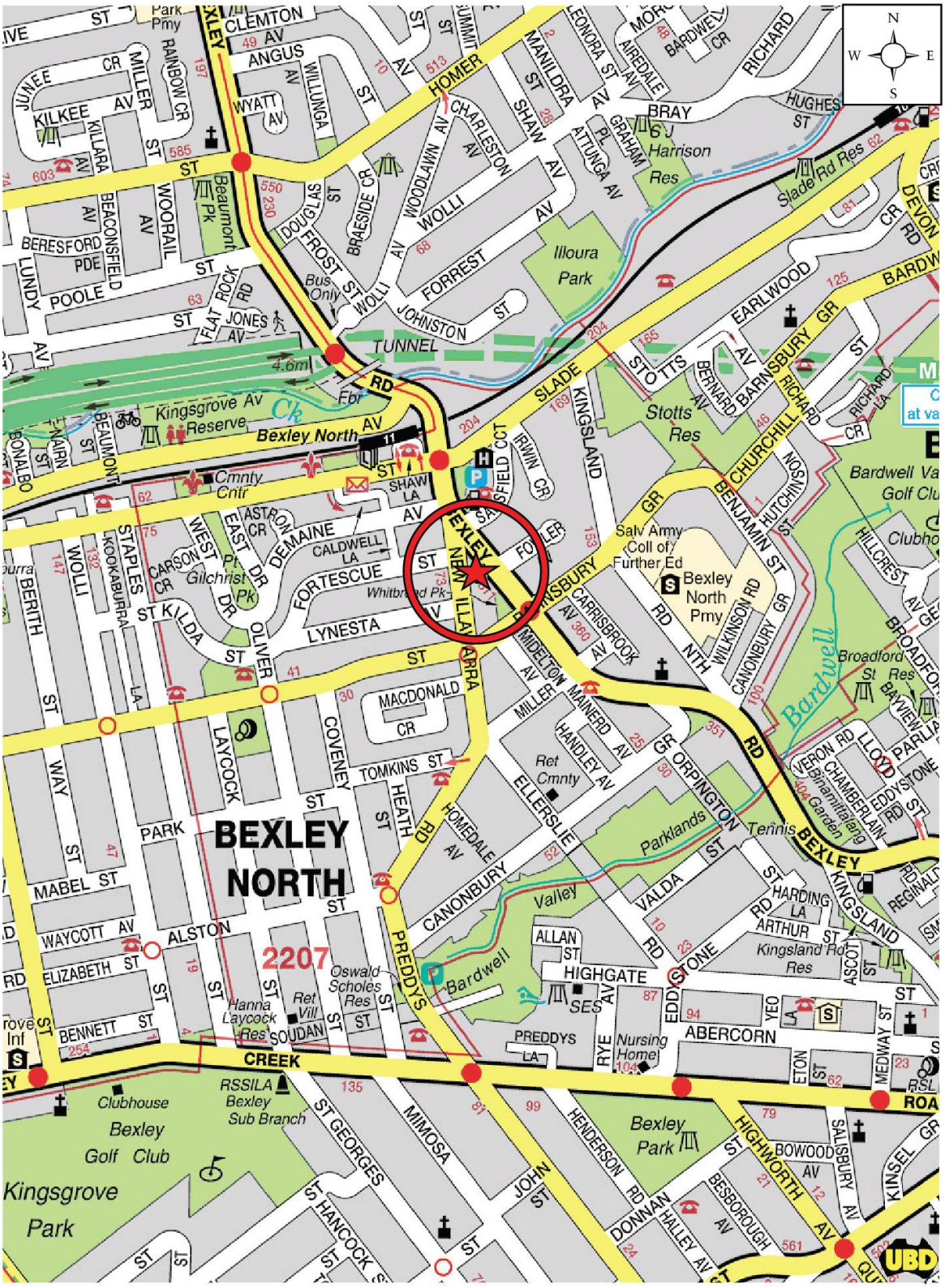
- reviews the road network in the vicinity of the site, and the traffic conditions on that road network

- reviews the public transport services available in the vicinity of the site

- estimates the traffic generation potential of the Planning Proposal, and assigns that traffic generation to the road network serving the site

- assesses the traffic implications of the Planning Proposal in terms of road network capacity

- reviews the off-street car parking requirements applicable to the Planning Proposal.



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LOCATION
FIGURE 1

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SITE
FIGURE 2

2. PROPOSED DEVELOPMENT

Site

The subject site extends between New Illawarra Road and Bexley Road, opposite Fortescue Street and Fowler Avenue. The site has street frontages approximately 85m in length to New Illawarra Road, approximately 72m in length to Bexley Road and occupies an area of approximately 4,257m^2.

The subject site is currently occupied by six residential dwelling houses as well as a service station with mechanical workshop, all with off-street parking. Vehicular access to the site is currently provided via a number of driveways fronting both New Illawarra Road as well as Bexley Road. A recent aerial image of the site and its surroundings is reproduced below.

Source: Nearmap

Proposed Development

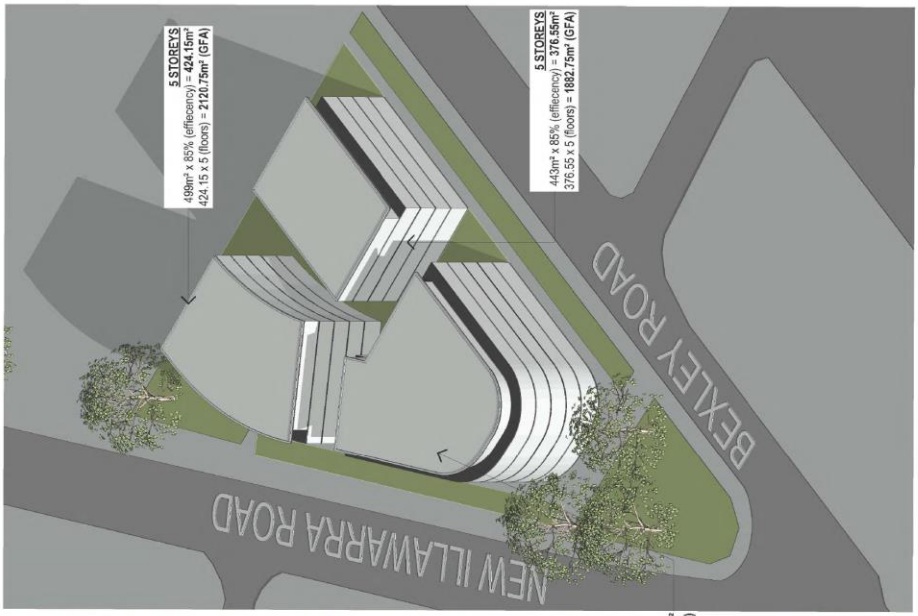
The Planning Proposal involves the rezoning of the land from *R2 – Low Density Residential* to *R4 – High Density Residential.* The Planning Proposal envisages the construction of three new five to six-storey residential apartment buildings resulting in a yield of approximately 100 new dwellings.

Off-street parking is to be provided in two separate new basement car parking areas, with the number of spaces to be provided in accordance with Council's requirements. Vehicular access to the site is to be provided via two separate two-way driveways located off New Illawarra Road.

Concept plans of the Planning Proposal have been prepared by *Urbanlink* and are reproduced on the following pages.

LOCATION PLAN OF PLANNING PROPOSAL SITE


PROPOSED BUILDING SETBACKS
BEXLEY ROAD
NEW ILLAWARRA ROAD
PARK
5 STOREY 499 m²
5 STOREY 443 m²
6 STOREY 789 m²
12,000
12,000
12,000
6,000
6,000
6,000
18,000
18,000
12,000
6,000
6,000
6,000
15,000
12,000
6,000
LEVEL 01
1

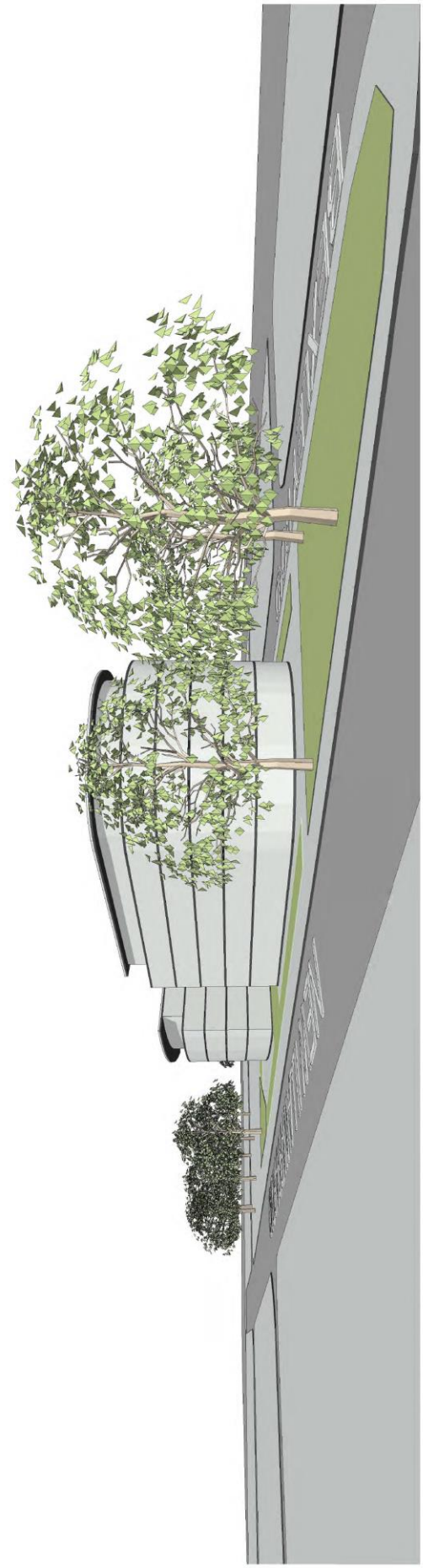


3D MASSING OF PROPOSAL

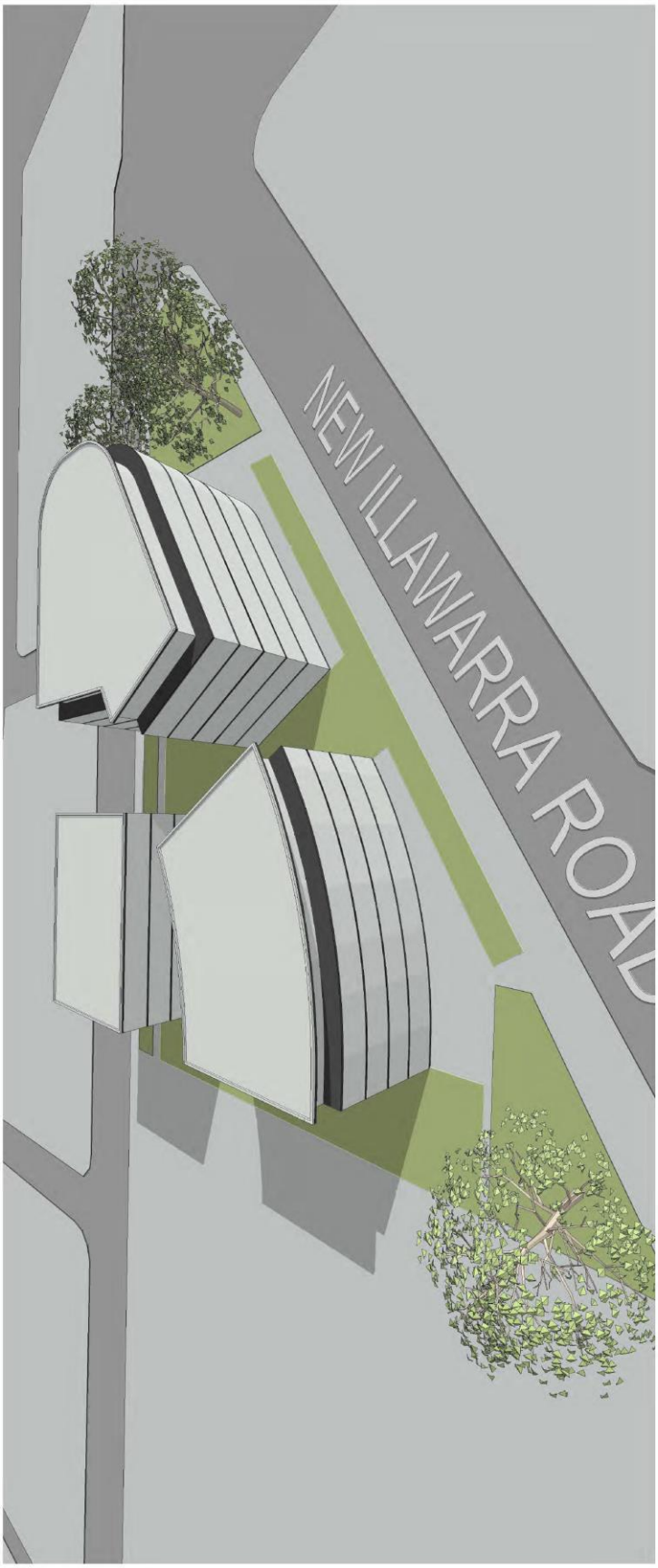
PROPOSED MASSING AND **SHADOW** OUTLINES

FSR & GFA DIAGRAM

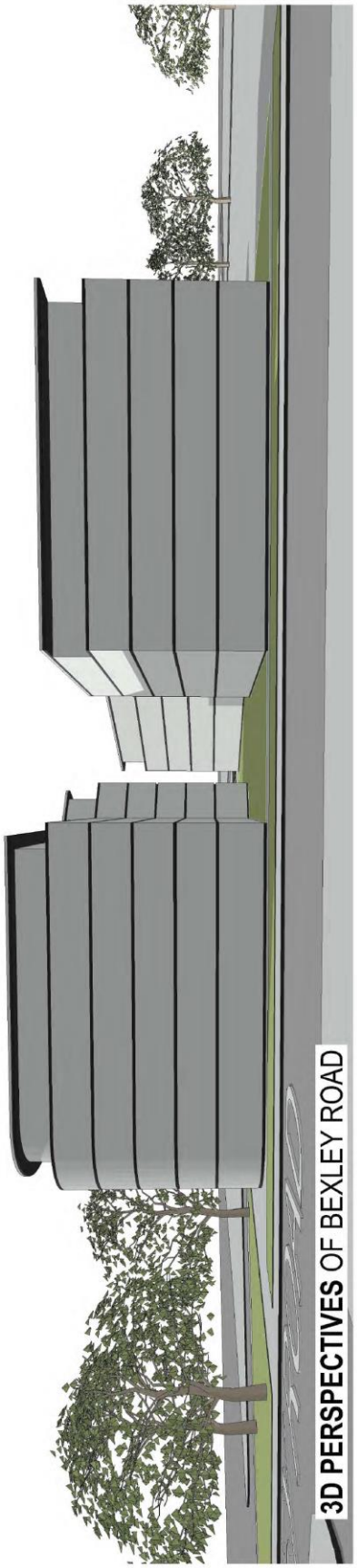
LANDSCAPE & DEEP SOIL DIAGRAM



3D PERSPECTIVES OF PLANNING PROPOSAL



3D PERSPECTIVES OF PLANNING PROPOSAL



3D PERSPECTIVES OF BEXLEY ROAD

3. TRAFFIC ASSESSMENT

Road Hierarchy

The road hierarchy allocated to the road network in the vicinity of the site by the Roads and Maritime Services is illustrated on Figure 3.

Bexley Road is classified by the RMS as a *State Road* and provides the key north-south road link in the area, linking Campsie to Bexley. It typically carries two traffic lanes in each direction in the vicinity of the site, with kerbside parking generally permitted outside of commuter peak periods.

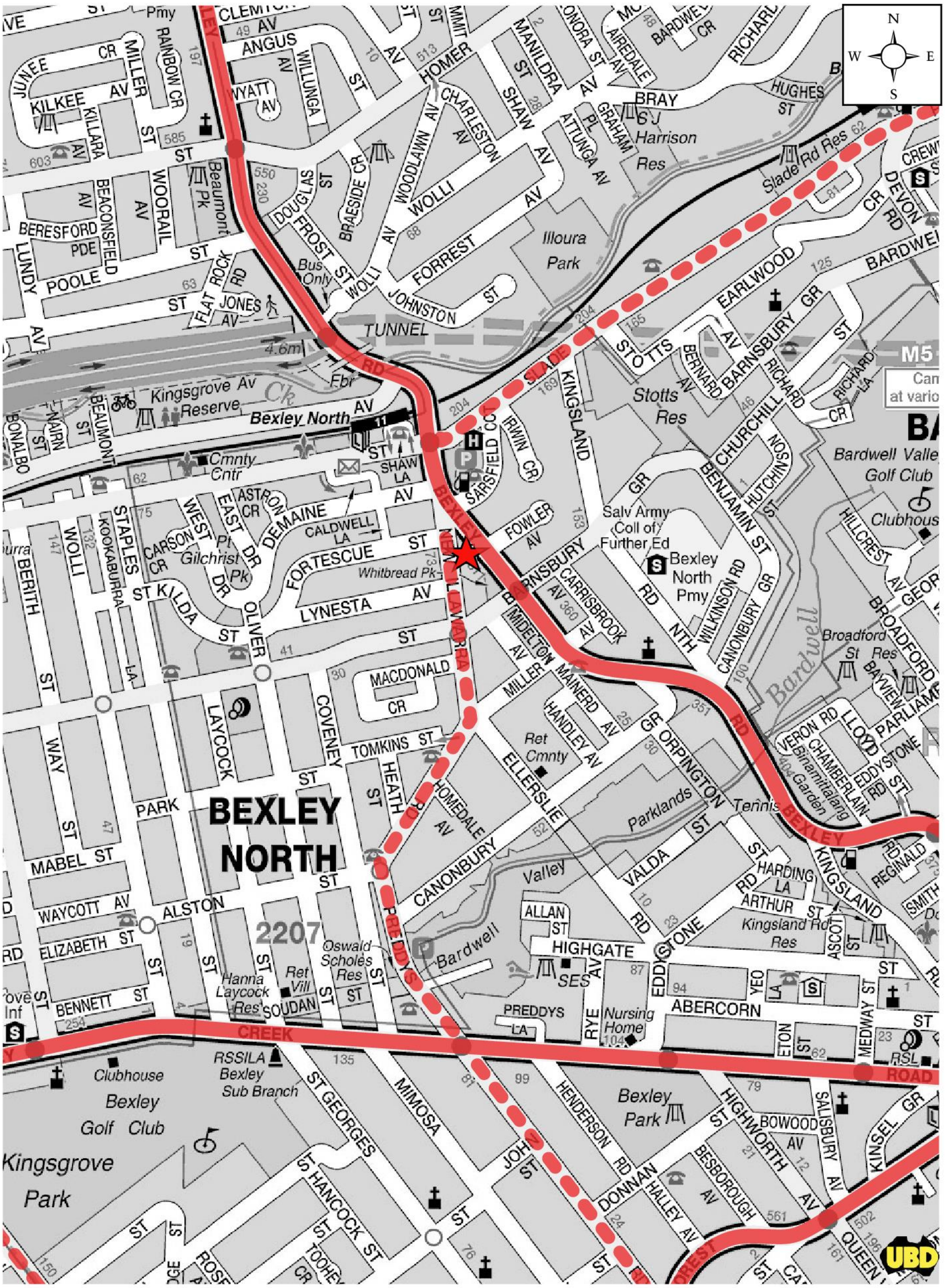
Stoney Creek Road is also classified by the RMS as a *State Road* and provides the key east-west road link in the area, linking Peakhurst to Bexley. It also typically carries two traffic lanes in each direction in the vicinity of the site, with Clearway restrictions applying during commuter peak periods.

New Illawarra Road is classified by the RMS as a *Regional Road* and provides the key north-south road link in the area. It typically carries one traffic lane with some kerbside parking permitted in selected locations only.

Existing Traffic Controls

The existing traffic controls which apply to the road network in the vicinity of the site are illustrated on Figure 4. Key features of those traffic controls are:

- a 60 km/h SPEED LIMIT which applies to Bexley Road
- a 50 km/h SPEED LIMIT which applies to New Illawarra Road and all other local roads in the area
- a ROUNDABOUT in New Illawarra Road where it intersects with Edward Street/Barnsbury Grove



Key:

State Road

Regional Road

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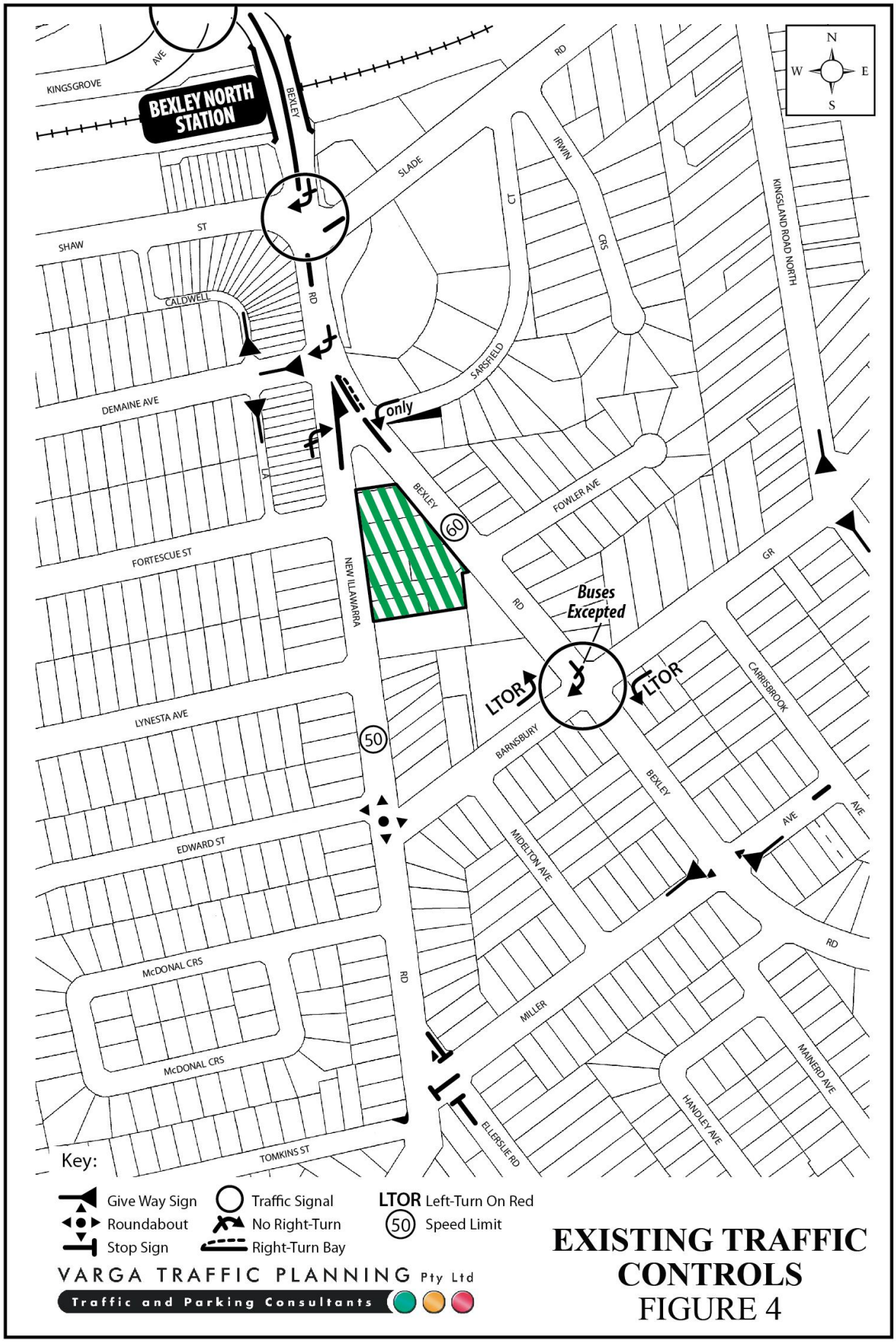
ROAD HIERARCHY

FIGURE 3


BEXLEY NORTH STATION
KINGSGROVE
AVE
BEXLEY
RD
SLADE
CT
IRWIN
CRS
KINGSLAND ROAD NORTH
SHAW
ST
CALDWELL
DEMAINE AVE
SARSFIELD
only
FOWLER AVE
60
FORTESCUE ST
NEW ILLAWARRA
Buses Excepted
LTOR
LTOR
LYNESTA AVE
50
BARNSBURY
CARRSBROOK
EDWARD ST
MIDDLETON AVE
McDONAL CRS
McDONAL CRS
MILLER
MAINERD AVE
HANDLEY AVE
ELLERSLIE RD
TOMKINS ST
N
W
E
S
Key:
Give Way Sign
Roundabout
Stop Sign
Traffic Signal
No Right-Turn
Right-Turn Bay
LTOR Left-Turn On Red
50 Speed Limit
VARGA TRAFFIC PLANNING Pty Ltd
Traffic and Parking Consultants
EXISTING TRAFFIC CONTROLS
FIGURE 4

- TRAFFIC SIGNALS in Bexley Road where it intersects with Shaw Street/Slade Road and also Barnsbury Grove

- a RIGHT TURN HOLDING BAY in Bexley Road for southbound traffic turning into New Illawarra Road

- a NO RIGHT TURN restriction for southbound traffic in Bexley Road turning into Barnsbury Grove (Buses Excepted)

- a NO RIGHT TURN restriction for southbound traffic in Bexley Road turning into Shaw Street.

Existing Public Transport Services

The existing public transport services available to the site are illustrated on Figure 5.

The site is located within an easy 250m walking distance of Bexley North Railway Station which provides regular suburban rail services between Sydney CBD and Campbelltown.

There are currently 5 bus routes travelling along either New Illawarra Road or Bexley Road as set out in the table below. These include the intra-regional *Metrobus* M41 and Route 400 bus services which travel between Hurstville/Ryde and Bondi Junction/Burwood respectively. The *M41* service operates seven days per week with weekday services every 15 minutes (every 10 minutes during the morning and afternoon peak) and weekend services every 20 minutes.

Bus Routes and Frequencies							
Route No.	**Route**	**Weekdays**		**Saturday**		**Sunday**	
		IN	**OUT**	**IN**	**OUT**	**IN**	**OUT**
M41	Hurstville Westfield to Waterloo Park	~62	~65	~33	~40	~34	~40
400	Bondi Junction to Burwood	126	127	86	84	86	82
491	Hurstville to Five Dock	36	36	32	30	17	15
493	Roselands to Rockdale	7	7	-	-	-	-
495	Kingsgrove to Bexley North	1	1	-	-	-	-
TOTAL		**232**	**236**	**151**	**154**	**137**	**137**

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Transport, Traffic and Parking Consultants

PUBLIC TRANSPORT
FIGURE 5

In summary there are more than 460 bus services travelling past the site on weekdays, decreasing to approximately 300 bus services on Saturdays and approximately 260 bus services on Sundays, as set out in the table below:

All of the abovementioned bus services provide access to suburban railway stations such as Hurstville, Bexley North, Campsie, Burwood, Rhodes, Banksia, Bondi Junction, Rockdale and Macquarie Park Railway Stations.

The site is also located just south of the Bexley North town centre where there is a wide range of essential shops and services such as a Woolworths supermarket, fruit market, butchery, bakery, seafood shop, restaurants, cafés, bottle shop, post office, pharmacy, optometrist, newsagency, hair dresser and beautician.

The site is therefore considered to be highly accessible by public transport and within easy walking distance of a broad range of shops and services which are located between the site and the railway station.

The site is therefore ideally suited to reduce levels of car ownership, and to encourage increased use of public transport and active forms of transport such as walking.

Existing Traffic Conditions

An indication of the existing traffic conditions on the road network in the vicinity of the site is provided by peak period traffic surveys undertaken as part of this traffic study. The traffic surveys were undertaken at the surrounding intersections listed below:

- Bexley Road, Shaw Street & Slade Road (traffic signals)
- Bexley Road & Demaine Avenue (give way)
- Bexley Road, New Illawarra Road & Sarsfield Circuit (give way)
- Bexley Road & Barnsbury Grove (traffic signals)
- New Illawarra Road, Barnsbury Grove & Edward Street (roundabout)

The results of the traffic surveys are reproduced in full in Appendix A and reveal that:

- two-way traffic flows in Bexley Road past the site frontage are typically in the order of 1,800 vehicles per hour (vph) during the morning and afternoon network peak periods

- two-way traffic flows in New Illawarra Road past the site frontage are much lower, typically in the order of 600 vph during the morning and afternoon network peak periods.

Projected Traffic Generation

An indication of the traffic generation potential of the residential component of the Planning Proposal is provided by reference to the Roads and Maritime Services publication *Technical Direction TDT 2013/04a (August 2013).*

The RMS's *Technical Direction* is based on extensive surveys of a wide range of land uses and nominates the following traffic generation rates which are applicable to the Planning Proposal:

High Density Residential Flat Buildings

AM: 0.19 peak hour vehicle trips per dwelling

PM: 0.15 peak hour vehicle trips per dwelling

Application of the above traffic generation rates to the potential yield of 100 residential apartments as outlined in the Planning Proposal yields the following traffic generation potential during commuter peak periods:

Projected Future Traffic Generation Potential

AM Peak Period:	19 vph
PM Peak Period:	15 vph

That projected future level of traffic generation potential should however, be offset or *discounted* by the volume of traffic which could reasonably be expected to be generated by the existing uses of the site, in order to determine the *nett increase (or decrease)* in traffic generation potential expected to occur as a consequence of the Planning Proposal.

The RMS *Guidelines* and *Technical Direction* nominate the following traffic generation rates which are applicable to the existing development on the site:

Low Density Residential Dwellings

AM: 0.95 peak hour vehicle trips per dwelling

PM: 0.99 peak hour vehicle trips per dwelling

Service Stations and Convenience Stores

Evening Peak Hour Vehicle Trips = 0.04A(S) + 0.3A(F)

Where: A(S) = area of site (m^2)

A(F) = convenience store GFA (m^2)

The existing service station also includes a mechanical workshop with two work bays. Reference to the RMS *Guidelines* indicates that, as a guide, 6 parking spaces should be provided per work bay – i.e. 12 parking spaces. If it is assumed that there are two mechanics on site and all customers drop off their car during the morning peak period and collect them during the afternoon peak period, then the workshop has a traffic generation potential of 14 peak hour vehicle trips.

Application of the above traffic generation rates to the existing development on the site yields a traffic generation potential of approximately 91 vehicle trips per hour during commuter peak periods as set out below:

Existing Traffic Generation Potential

	AM	**PM**
Dwelling houses (6 dwellings):	6 vph	6 vph
Service Station (1170m^2 site area, 80m^2 shop & workshop):	85 vph	85 vph
TOTAL TRAFFIC GENERATION POTENTIAL:	**91 vph**	**91 vph**

Accordingly, it is likely that the Planning Proposal will result in a ***substantial reduction*** in the traffic generation potential of the site of approximately 72 vph during the AM commuter peak period and approximately 76 vph during the PM commuter peak period, as set out below:

Projected Nett Reduction in Peak Hour Traffic Generation Potential of the site as a consequence of the Planning Proposal

	AM	PM
Projected Future Traffic Generation Potential:	19 vph	15 vph
Less Existing Traffic Generation Potential:	-91 vph	-91 vph
NETT DECREASE IN TRAFFIC GENERATION POTENTIAL:	**-72 vph**	**-76 vph**

For the purposes of this assessment however, it has been assumed that *all* of the projected future traffic flows of 19 vph during the AM commuter peak period and 15 vph during the PM commuter peak period will be new or *additional* to the existing traffic flows currently using the adjacent road network. Those additional traffic volumes and distributions are illustrated on Figure 6.

That projected level of future traffic generation potential of the site as a consequence of the Planning Proposal is *minimal* and will clearly not have any unacceptable traffic implications in terms of road network capacity, as is demonstrated by the following section of this report.

Traffic Implications - Road Network Capacity

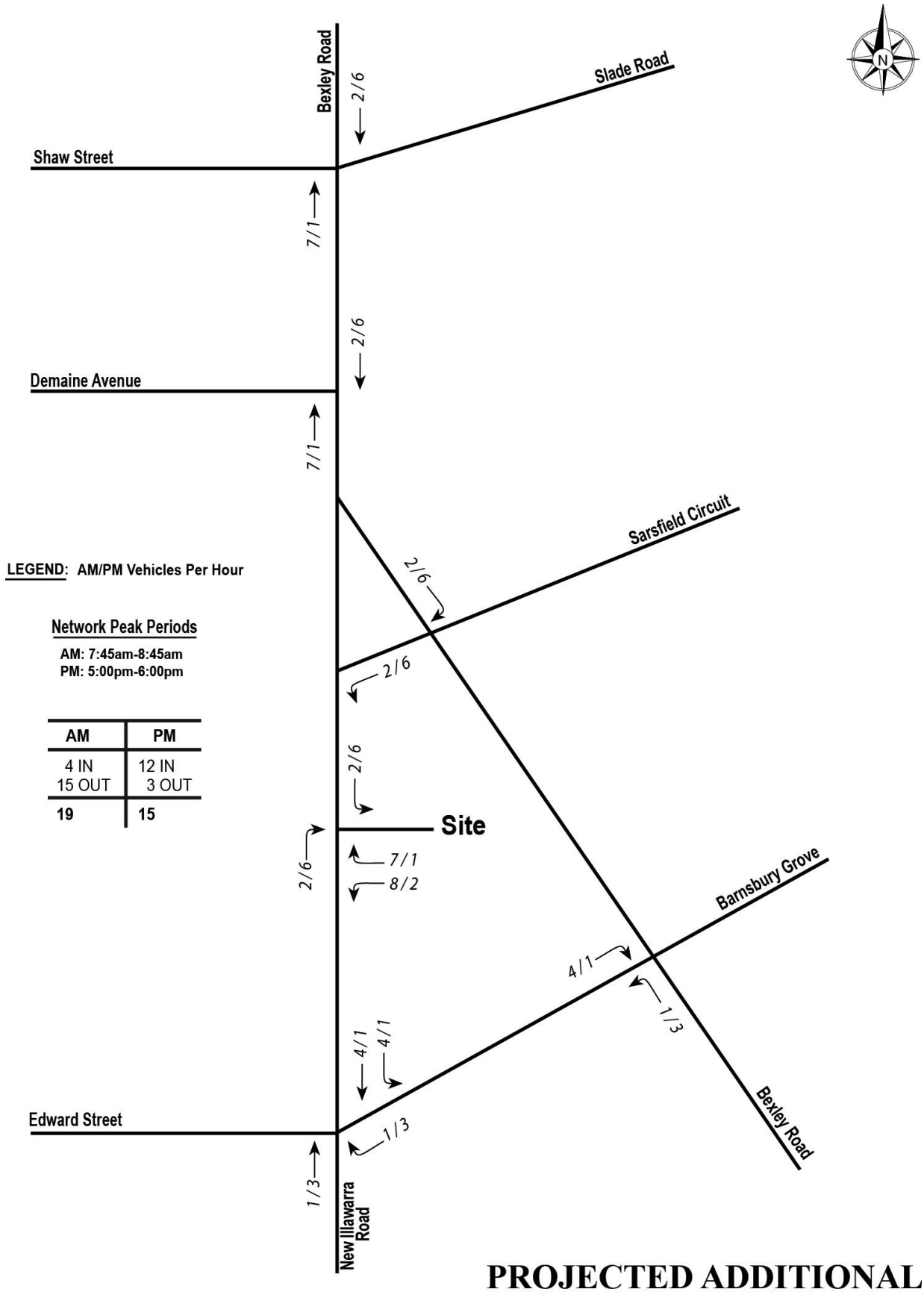
The traffic implications of development proposals primarily concern the effects that any *additional* traffic flows may have on the operational performance of the nearby road network. Those effects can be assessed using the SIDRA INTERSECTION 7 NETWORK program which is widely used by the RMS and many LGA's for this purpose. Criteria for evaluating the results of SIDRA analysis are reproduced in the following pages.

The results of the SIDRA analysis are summarised in the tables below, revealing that:

- the volume of traffic generated by the existing houses and service station on the site is in the order of 85 vph

- the volume of traffic expected to be generated by the Planning Proposal is in the order of 19 vph

- the Planning Proposal would result in a ***substantial reduction*** in the traffic flows generated by the site



PROJECTED ADDITIONAL TRAFFIC VOLUMES
FIGURE 6

- all of the intersections would continue to operate at current Levels of Service under the Planning Proposal traffic demands, and

- the Planning Proposal traffic flows would have no appreciable effect whatsoever on the performance of the nearby intersections.

In the circumstances, it is clear that the Planning Proposal will not have any unacceptable traffic implications in terms of road network capacity, and that no improvements works or intersection upgrades will be required on the adjacent road network as a consequence of the Planning Proposal.

TABLE 3.1 - RESULTS OF SIDRA ANALYSIS OF BEXLEY ROAD & SHAW STREET & SLADE ROAD

Key Indicators	Existing Traffic Demand		Projected Additional Traffic Demand	
	AM	**PM**	**AM**	**PM**
Level of Service	E	D	E	D
Degree of Saturation	0.920	0.880	0.925	0.880
Average Vehicle Delay (secs/veh)	**64.2**	**52.0**	**66.8**	**52.3**

TABLE 3.2 - RESULTS OF SIDRA ANALYSIS OF BEXLEY ROAD & DERMAINE AVENUE

Key Indicators	Existing Traffic Demand		Projected Additional Traffic Demand	
	AM	**PM**	**AM**	**PM**
Level of Service	A	A	A	A
Degree of Saturation	0.518	0.382	0.528	0.383
Average Vehicle Delay (secs/veh)	**0.7**	**0.2**	**0.7**	**0.2**

TABLE 3.3 - RESULTS OF SIDRA ANALYSIS OF BEXLEY ROAD, NEW ILLAWARRA ROAD & SARSFIELD CIRCUIT				
Key Indicators	**Existing Traffic Demand**		**Projected Additional Traffic Demand**	
	AM	**PM**	**AM**	**PM**
Level of Service	A	A	A	A
Degree of Saturation	0.718	0.871	0.722	0.883
Average Vehicle Delay (secs/veh)	**3.4**	**5.5**	**3.4**	**5.8**

TABLE 3.4 - RESULTS OF SIDRA ANALYSIS OF BEXLEY ROAD & BARNSBURY GROVE				
Key Indicators	**Existing Traffic Demand**		**Projected Additional Traffic Demand**	
	AM	**PM**	**AM**	**PM**
Level of Service	B	A	B	A
Degree of Saturation	0.739	0.594	0.757	0.594
Average Vehicle Delay (secs/veh)	**16.3**	**12.6**	**17.4**	**12.6**

TABLE 3.5 - RESULTS OF SIDRA ANALYSIS OF NEW ILLAWARRA ROAD, BARNSBURY ROAD & EDWARD STREET				
Key Indicators	**Existing Traffic Demand**		**Projected Additional Traffic Demand**	
	AM	**PM**	**AM**	**PM**
Level of Service	A	A	A	A
Degree of Saturation	0.436	0.478	0.437	0.482
Average Vehicle Delay (secs/veh)	**7.2**	**7.5**	**7.2**	**7.5**

Criteria for Interpreting Results of Sidra Analysis

1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good operation.	Good operation.
'B'	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
'C'	Satisfactory.	Satisfactory but accident study required.
'D'	Operating near capacity.	Near capacity and accident study required.
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.
'F'	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode.

2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation.	Good operation.
B	15 to 28	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
C	29 to 42	Satisfactory.	Satisfactory but accident study required.
D	43 to 56	Operating near capacity.	Near capacity and accident study required.
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.

3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by traffic signals[1] both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a roundabout or GIVE WAY or STOP signs, satisfactory intersection operation is indicated by a DS of 0.8 or less.

[1] *The values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs.*

4. PARKING IMPLICATIONS

Existing Kerbside Parking Restrictions

The existing kerbside parking restrictions which apply to the road network in the vicinity of the site are illustrated on Figure 7 and comprise:

- NO PARKING restrictions along the Bexley Road site frontage during the morning and afternoon commuter peak periods, with UNRESTRICTED parking permitted at all other times

- NO PARKING restrictions along the northern portion of the New Illawarra Road site frontage

- generally UNRESTRICTED PARKING elsewhere along New Illawarra Road in the vicinity of the site including the southern portion of the site frontage

- BUS ZONES located at regular intervals along both sides of New Illawarra Road and Bexley Road.

Off-Street Parking Provisions

The off-street parking requirements applicable to the Planning Proposal are specified in Council's *Development Control Plan 2011, Part 4.6: Car parking, Access and Movement* document in the following terms:

Residential Flat Buildings

- 1 space/studio, 1 and 2 bedrooms apartments
- 2 spaces/3 bedrooms apartments or more
- Visitor parking: 1 space/5 dwellings (including a carwash bay)


N
W
E
S
1P
BZ
(AM/PM Peak)
BEXLEY
FOWLER AVENUE
(AM/PM Peak)
NEW ILLAWARRA
ROAD
BZ
BZ
BZ
BZ
LYNESTA AVENUE
(AM Peak)
BZ
BZ
ROAD
GROVE
BARNSBURY
MIDELTON AVENUE
EDWARD STREET
Key:
No Stopping
No Parking
Restricted Parking
BZ Bus Zone
VARGA TRAFFIC PLANNING Pty Ltd
Traffic and Parking Consultants
EXISTING PARKING RESTRICTIONS
FIGURE 7

It is anticipated that the above parking requirements will be satisfied by the proposed provision of basement car parking areas, with vehicular access to be provided off the New Illawarra Road frontage of the site.

In addition, the geometric design layout of the future car parking facilities will also ultimately be designed to comply with Standards Australia publication *Parking Facilities Part 1 - Off-Street Car Parking AS2890.1* and *Parking Facilities Part 6 - Off-Street Parking for People with Disabilities AS2890.6*.

It should also be noted that the 11 existing vehicular access driveways which service the site in both Bexley Road and New Illawarra Road will be replaced with just two new entry/exit driveways in New Illawarra Road, thereby improving the road network efficiency and providing additional kerbside parking as the redundant driveways will be restored to kerb and gutter.

Conclusion

The Planning Proposal seeks to amend the existing planning controls on the subject site to permit a high density residential uses, resulting in a potential yield of 100 residential apartments. Based on the analysis and discussions presented within this report, the following conclusions are made:

- the Planning Proposal is expected to have a traffic generation potential of approximately 19 vph during the AM commuter peak period and 15 vph during the PM commuter peak period, resulting in a significant *reduction* in the traffic generation potential of the site when compared to the existing low density residential and service station uses

- the capacity analysis of nearby intersections using the SIDRA capacity analysis program indicates that:

    - the projected additional traffic flows will not have any adverse effects on the operational performance on the surrounding intersections, and

- no road improvements or intersection upgrades will be required as a consequence of the Planning Proposal

- the future design will accommodate all of the required off-street parking within two new basement car parking areas and will comply with all relevant standards and guidelines.

In summary, the future parking facilities are capable of satisfying the relevant requirements specified in both Council's *DCP 2011* as well as the Australian Standards (with detailed analysis to be undertaken at DA stage), and it is therefore concluded that the Planning Proposal will not have any unacceptable parking implications.

APPENDIX A

TRAFFIC SURVEY DATA

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning

Job No/Name : 6389 BEXLEY NTH Bexley Rd

Day/Date : Tuesday 14th March 2017

Lights

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Barnsbury Gr*			*New Illawarra*			*Barnsbury Gr*			
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
0700 - 0715	6	156	0	26	13	6	3	199	21	0	4	9	**443**
0715 - 0730	2	155	0	20	31	16	1	222	16	0	12	7	**482**
0730 - 0745	7	176	0	36	36	11	1	251	22	0	13	6	**559**
0745 - 0800	4	160	0	31	52	9	6	239	27	1	27	7	**563**
0800 - 0815	9	183	0	23	40	11	4	241	21	1	26	9	**568**
0815 - 0830	1	196	0	34	55	22	13	249	15	5	35	9	**634**
0830 - 0845	13	185	0	23	73	27	6	209	45	1	33	10	**625**
0845 - 0900	15	172	0	24	78	19	2	194	37	2	44	9	**596**
Period End	**57**	**1383**	**0**	**217**	**378**	**121**	**36**	**1804**	**204**	**10**	**194**	**66**	**4470**

Heavies

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Barnsbury Gr*			*New Illawarra*			*Barnsbury Gr*			
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
0700 - 0715	1	2	1	0	0	0	0	6	0	0	0	0	**10**
0715 - 0730	0	1	3	1	0	0	0	1	0	0	0	1	**7**
0730 - 0745	1	3	1	0	0	0	0	8	0	0	0	1	**14**
0745 - 0800	0	1	1	0	0	0	0	3	0	0	0	1	**6**
0800 - 0815	1	2	2	0	0	0	0	3	0	0	0	0	**8**
0815 - 0830	0	3	0	0	0	0	0	1	0	0	0	1	**5**
0830 - 0845	1	2	2	0	0	0	0	5	0	0	0	0	**10**
0845 - 0900	0	4	1	0	0	0	0	4	0	0	0	1	**10**
Period End	**4**	**18**	**11**	**1**	**0**	**0**	**0**	**31**	**0**	**0**	**0**	**5**	**70**

Lights

	NORTH			WEST			SOUTH			EAST			
	New Illawarra Rd			*Barnsbury Gr*			*New Illawarra Rd*			*Barnsbury Gr*			
Peak Time	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
0700 - 0800	19	647	0	113	132	42	11	911	86	1	56	29	**2047**
0715 - 0815	22	674	0	110	159	47	12	953	86	2	78	29	**2172**
0730 - 0830	21	715	0	124	183	53	24	980	85	7	101	31	**2324**
0745 - 0845	27	724	0	111	220	69	29	938	108	8	121	35	**2390**
0800 - 0900	38	736	0	104	246	79	25	893	118	9	138	37	**2423**
PEAK HOUR	**38**	**736**	**0**	**104**	**246**	**79**	**25**	**893**	**118**	**9**	**138**	**37**	**2423**

Heavies

	NORTH			WEST			SOUTH			EAST			
	New Illawarra Rd			*Barnsbury Gr*			*New Illawarra Rd*			*Barnsbury Gr*			
Peak Time	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
0700 - 0800	2	7	6	1	0	0	0	18	0	0	0	3	**37**
0715 - 0815	2	7	7	1	0	0	0	15	0	0	0	3	**35**
0730 - 0830	2	9	4	0	0	0	0	15	0	0	0	3	**33**
0745 - 0845	2	8	5	0	0	0	0	12	0	0	0	2	**29**
0800 - 0900	2	11	5	0	0	0	0	13	0	0	0	2	**33**
PEAK HOUR	**2**	**11**	**5**	**0**	**0**	**0**	**0**	**13**	**0**	**0**	**0**	**2**	**33**

Combined

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Barnsbury Gr*			*New Illawarra*			*Barnsbury Gr*			
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
0700 - 0715	7	158	1	26	13	6	3	205	21	0	4	9	**453**
0715 - 0730	2	156	3	21	31	16	1	223	16	0	12	8	**489**
0730 - 0745	8	179	1	36	36	11	1	259	22	0	13	7	**573**
0745 - 0800	4	161	1	31	52	9	6	242	27	1	27	8	**569**
0800 - 0815	10	185	2	23	40	11	4	244	21	1	26	9	**576**
0815 - 0830	1	199	0	34	55	22	13	250	15	5	35	10	**639**
0830 - 0845	14	187	2	23	73	27	6	214	45	1	33	10	**635**
0845 - 0900	15	176	1	24	78	19	2	198	37	2	44	10	**606**
Period End	**61**	**1401**	**11**	**218**	**378**	**121**	**36**	**1835**	**204**	**10**	**194**	**71**	**4540**

Peds

	NORTH	WEST	SOUTH	EAST	
	New Illawarra	*Barnsbury Gr*	*New Illawarra*	*Barnsbury Gr*	
Time Per	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**TOT**
0700 - 0715	0	0	0	1	**1**
0715 - 0730	0	3	0	3	**6**
0730 - 0745	0	6	3	1	**10**
0745 - 0800	1	4	0	0	**5**
0800 - 0815	0	7	1	2	**10**
0815 - 0830	0	2	0	0	**2**
0830 - 0845	0	6	1	1	**8**
0845 - 0900	0	0	0	1	**1**
Period End	**1**	**28**	**5**	**9**	**43**

Combined

	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Barnsbury Gr*			*Bexley Rd*			*Barnsbury Gr*			
Peak Time	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
0700 - 0800	21	654	6	114	132	42	11	929	86	1	56	32	**2084**
0715 - 0815	24	681	7	111	159	47	12	968	86	2	78	32	**2207**
0730 - 0830	23	724	4	124	183	53	24	995	85	7	101	34	**2357**
0745 - 0845	29	732	5	111	220	69	29	950	108	8	121	37	**2419**
0800 - 0900	40	747	5	104	246	79	25	906	118	9	138	39	**2456**
PEAK HOUR	**40**	**747**	**5**	**104**	**246**	**79**	**25**	**906**	**118**	**9**	**138**	**39**	**2456**

Peds

	NORTH	WEST	SOUTH	EAST	
	New Illawarra	*Barnsbury Gr*	*New Illawarra*	*Barnsbury Gr*	
Peak Per	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**TOT**
0700 - 0800	1	13	3	5	**22**
0715 - 0815	1	20	4	6	**31**
0730 - 0830	1	19	4	3	**27**
0745 - 0845	1	19	2	3	**25**
0800 - 0900	0	15	2	4	**21**
PEAK HR	**0**	**15**	**2**	**4**	**21**

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning

Job No/Name : 6389 BEXLEY NTH Bexley Rd

Day/Date : Tuesday 14th March 2017

Lights

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Barnsbury Gr*			*New Illawarra*			*Barnsbury Gr*			
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1600 - 1615	12	175	0	14	15	8	7	246	15	1	62	2	**557**
1615 - 1630	9	172	0	10	28	10	13	231	17	3	44	5	**542**
1630 - 1645	4	200	0	6	21	5	12	243	9	3	45	7	**555**
1645 - 1700	5	181	0	15	29	11	7	216	8	2	46	5	**525**
1700 - 1715	11	202	0	5	24	7	12	249	16	3	35	2	**566**
1715 - 1730	10	185	0	11	34	10	21	254	12	1	42	5	**585**
1730 - 1745	6	183	0	9	27	11	21	256	14	2	56	2	**587**
1745 - 1800	8	212	0	10	17	8	12	247	16	2	41	2	**575**
Period End	**65**	**1510**	**0**	**80**	**195**	**70**	**105**	**1942**	**107**	**17**	**371**	**30**	**4492**

Heavies

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Barnsbury Gr*			*New Illawarra*			*Barnsbury Gr*			
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1600 - 1615	1	2	0	0	0	0	0	5	0	0	1	1	**10**
1615 - 1630	0	2	5	0	0	0	0	1	0	0	0	1	**9**
1630 - 1645	1	2	0	0	0	0	0	2	0	0	0	0	**5**
1645 - 1700	0	2	2	0	0	0	0	1	0	0	0	1	**6**
1700 - 1715	1	0	0	0	0	0	0	4	0	0	0	0	**5**
1715 - 1730	0	4	2	0	0	0	0	2	0	0	0	1	**9**
1730 - 1745	1	2	0	0	0	0	0	4	0	0	0	0	**7**
1745 - 1800	0	2	2	0	0	0	0	4	0	0	0	1	**9**
Period End	**4**	**16**	**11**	**0**	**0**	**0**	**0**	**23**	**0**	**0**	**1**	**5**	**60**

Lights

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Barnsbury Gr*			*New Illawarra*			*Barnsbury Gr*			
Peak Time	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1600 - 1700	30	728	0	45	93	34	39	936	49	9	197	19	**2179**
1615 - 1715	29	755	0	36	102	33	44	939	50	11	170	19	**2188**
1630 - 1730	30	768	0	37	108	33	52	962	45	9	168	19	**2231**
1645 - 1745	32	751	0	40	114	39	61	975	50	8	179	14	**2263**
1700 - 1800	35	782	0	35	102	36	66	1006	58	8	174	11	**2313**
PEAK HOUR	**35**	**782**	**0**	**35**	**102**	**36**	**66**	**1006**	**58**	**8**	**174**	**11**	**2313**

Heavies

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Barnsbury Gr*			*New Illawarra*			*Barnsbury Gr*			
Peak Time	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1600 - 1700	2	8	7	0	0	0	0	9	0	0	1	3	**30**
1615 - 1715	2	6	7	0	0	0	0	8	0	0	0	2	**25**
1630 - 1730	2	8	4	0	0	0	0	9	0	0	0	2	**25**
1645 - 1745	2	8	4	0	0	0	0	11	0	0	0	2	**27**
1700 - 1800	2	8	4	0	0	0	0	14	0	0	0	2	**30**
PEAK HOUR	**2**	**8**	**4**	**0**	**0**	**0**	**0**	**14**	**0**	**0**	**0**	**2**	**30**

Combined

	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Barnsbury Gr*			*Bexley Rd*			*Barnsbury Gr*			
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1600 - 1615	13	177	0	14	15	8	7	251	15	1	63	3	**567**
1615 - 1630	9	174	5	10	28	10	13	232	17	3	44	6	**551**
1630 - 1645	5	202	0	6	21	5	12	245	9	3	45	7	**560**
1645 - 1700	5	183	2	15	29	11	7	217	8	2	46	6	**531**
1700 - 1715	12	202	0	5	24	7	12	253	16	3	35	2	**571**
1715 - 1730	10	189	2	11	34	10	21	256	12	1	42	6	**594**
1730 - 1745	7	185	0	9	27	11	21	260	14	2	56	2	**594**
1745 - 1800	8	214	2	10	17	8	12	251	16	2	41	3	**584**
Period End	**69**	**1526**	**11**	**80**	**195**	**70**	**105**	**1965**	**107**	**17**	**372**	**35**	**4552**

Peds

	NORTH	WEST	SOUTH	EAST	
	New Illawarra	*Barnsbury Gr*	*New Illawarra*	*Barnsbury Gr*	
Time Per	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**TOT**
1600 - 1615	0	3	4	2	**9**
1615 - 1630	0	2	0	0	**2**
1630 - 1645	2	3	0	0	**5**
1645 - 1700	0	0	0	1	**1**
1700 - 1715	0	3	0	0	**3**
1715 - 1730	0	3	2	0	**5**
1730 - 1745	0	1	2	0	**3**
1745 - 1800	0	2	2	1	**5**
Period End	**2**	**17**	**10**	**4**	**33**

Combined

	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Barnsbury Gr*			*Bexley Rd*			*Barnsbury Gr*			
Peak Time	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1600 - 1700	32	736	7	45	93	34	39	945	49	9	198	22	**2209**
1615 - 1715	31	761	7	36	102	33	44	947	50	11	170	21	**2213**
1630 - 1730	32	776	4	37	108	33	52	971	45	9	168	21	**2256**
1645 - 1745	34	759	4	40	114	39	61	986	50	8	179	16	**2290**
1700 - 1800	37	790	4	35	102	36	66	1020	58	8	174	13	**2343**
PEAK HOUR	**37**	**790**	**4**	**35**	**102**	**36**	**66**	**1020**	**58**	**8**	**174**	**13**	**2343**

Peds

	NORTH	WEST	SOUTH	EAST	
	New Illawarra	*Barnsbury Gr*	*New Illawarra*	*Barnsbury Gr*	
Peak Per	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**TOT**
1600 - 1700	2	8	4	3	**17**
1615 - 1715	2	8	0	1	**11**
1630 - 1730	2	9	2	1	**14**
1645 - 1745	0	7	4	1	**12**
1700 - 1800	0	9	6	1	**16**
PEAK HR	**0**	**9**	**6**	**1**	**16**

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning

Job No/Name : 6389 BEXLEY NTH Bexley Rd

Day/Date : Tuesday 14th March 2017

Lights

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Edward St*			*New Illawarra*			*Barnsbury Gr*			
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
0700 - 0715	4	45	2	8	10	1	2	81	27	3	4	1	**188**
0715 - 0730	3	38	4	4	25	0	3	89	40	6	7	1	**220**
0730 - 0745	3	44	1	2	28	2	3	58	60	9	4	0	**214**
0745 - 0800	4	62	8	3	24	1	6	67	69	22	10	3	**279**
0800 - 0815	4	60	11	1	32	1	11	76	45	21	10	3	**275**
0815 - 0830	9	64	3	0	41	3	5	67	58	22	21	4	**297**
0830 - 0845	10	77	7	3	51	2	8	59	64	15	21	3	**320**
0845 - 0900	7	64	5	2	56	3	2	65	52	20	16	5	**297**
Period End	**44**	**454**	**41**	**23**	**267**	**13**	**40**	**562**	**415**	**118**	**93**	**20**	**2090**

Heavies

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Edward St*			*New Illawarra*			*Barnsbury Gr*			
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
0700 - 0715	0	0	0	0	0	0	0	1	0	1	0	0	**2**
0715 - 0730	0	1	0	1	0	0	0	3	1	3	0	0	**9**
0730 - 0745	0	1	0	0	0	0	0	6	0	1	0	0	**8**
0745 - 0800	0	1	0	0	0	0	0	4	0	1	0	0	**6**
0800 - 0815	0	1	0	0	0	0	0	1	0	2	0	0	**4**
0815 - 0830	0	1	0	0	0	0	0	3	0	0	0	0	**4**
0830 - 0845	0	2	0	0	0	0	0	1	0	2	0	0	**5**
0845 - 0900	0	2	0	0	0	0	0	3	0	1	0	0	**6**
Period End	**0**	**9**	**0**	**1**	**0**	**0**	**0**	**22**	**1**	**11**	**0**	**0**	**44**

Lights

	NORTH			WEST			SOUTH			EAST			
	New Illawarra Rd			*Edward St*			*New Illawarra Rd*			*Barnsbury Gr*			
Peak Time	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
0700 - 0800	14	189	15	17	87	4	14	295	196	40	25	5	**901**
0715 - 0815	14	204	24	10	109	4	23	290	214	58	31	7	**988**
0730 - 0830	20	230	23	6	125	7	25	268	232	74	45	10	**1065**
0745 - 0845	27	263	29	7	148	7	30	269	236	80	62	13	**1171**
0800 - 0900	30	265	26	6	180	9	26	267	219	78	68	15	**1189**
PEAK HOUR	**30**	**265**	**26**	**6**	**180**	**9**	**26**	**267**	**219**	**78**	**68**	**15**	**1189**

Heavies

	NORTH			WEST			SOUTH			EAST			
	New Illawarra Rd			*Edward St*			*New Illawarra Rd*			*Barnsbury Gr*			
Peak Time	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
0700 - 0800	0	3	0	1	0	0	0	14	1	6	0	0	**25**
0715 - 0815	0	4	0	1	0	0	0	14	1	7	0	0	**27**
0730 - 0830	0	4	0	0	0	0	0	14	0	4	0	0	**22**
0745 - 0845	0	5	0	0	0	0	0	9	0	5	0	0	**19**
0800 - 0900	0	6	0	0	0	0	0	8	0	5	0	0	**19**
PEAK HOUR	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**5**	**0**	**0**	**19**

Combined

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Edward St*			*New Illawarra*			*Barnsbury Gr*			
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
0700 - 0715	4	45	2	8	10	1	2	82	27	4	4	1	**190**
0715 - 0730	3	39	4	5	25	0	3	92	41	9	7	1	**229**
0730 - 0745	3	45	1	2	28	2	3	64	60	10	4	0	**222**
0745 - 0800	4	63	8	3	24	1	6	71	69	23	10	3	**285**
0800 - 0815	4	61	11	1	32	1	11	77	45	23	10	3	**279**
0815 - 0830	9	65	3	0	41	3	5	70	58	22	21	4	**301**
0830 - 0845	10	79	7	3	51	2	8	60	64	17	21	3	**325**
0845 - 0900	7	66	5	2	56	3	2	68	52	21	16	5	**303**
Period End	**44**	**463**	**41**	**24**	**267**	**13**	**40**	**584**	**416**	**129**	**93**	**20**	**2134**

Peds

	NORTH	WEST	SOUTH	EAST	
	New Illawarra	*Edward St*	*New Illawarra*	*Barnsbury Gr*	
Time Per	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**TOT**
0700 - 0715	0	2	0	0	**2**
0715 - 0730	0	4	0	1	**5**
0730 - 0745	1	13	0	0	**14**
0745 - 0800	1	6	0	0	**7**
0800 - 0815	0	6	0	3	**9**
0815 - 0830	0	2	2	4	**8**
0830 - 0845	0	4	0	1	**5**
0845 - 0900	0	4	3	1	**8**
Period End	**2**	**41**	**5**	**10**	**58**

Combined

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Edward St*			*New Illawarra*			*Barnsbury Gr*			
Peak Time	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
0700 - 0800	14	192	15	18	87	4	14	309	197	46	25	5	**926**
0715 - 0815	14	208	24	11	109	4	23	304	215	65	31	7	**1015**
0730 - 0830	20	234	23	6	125	7	25	282	232	78	45	10	**1087**
0745 - 0845	27	268	29	7	148	7	30	278	236	85	62	13	**1190**
0800 - 0900	30	271	26	6	180	9	26	275	219	83	68	15	**1208**
PEAK HOUR	**30**	**271**	**26**	**6**	**180**	**9**	**26**	**275**	**219**	**83**	**68**	**15**	**1208**

Peds

	NORTH	WEST	SOUTH	EAST	
	New Illawarra	*Edward St*	*New Illawarra*	*Barnsbury Gr*	
Peak Per	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**TOT**
0700 - 0800	2	25	0	1	**28**
0715 - 0815	2	29	0	4	**35**
0730 - 0830	2	27	2	7	**38**
0745 - 0845	1	18	2	8	**29**
0800 - 0900	0	16	5	9	**30**
PEAK HR	**0**	**16**	**5**	**9**	**30**

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning

Job No/Name : 6389 BEXLEY NTH Bexley Rd

Day/Date : Tuesday 14th March 2017

Lights

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Edward St*			*New Illawarra*			*Barnsbury Gr*			
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1600 - 1615	3	103	8	10	9	1	15	50	21	36	28	3	**287**
1615 - 1630	3	89	5	3	17	1	11	34	32	26	34	4	**259**
1630 - 1645	0	98	4	3	3	1	4	44	24	27	31	2	**241**
1645 - 1700	2	96	1	2	10	2	6	61	36	24	19	1	**260**
1700 - 1715	2	92	6	2	9	1	7	43	32	29	29	2	**254**
1715 - 1730	2	99	6	2	17	3	4	51	29	18	41	6	**278**
1730 - 1745	3	97	6	2	13	0	5	51	25	32	37	5	**276**
1745 - 1800	4	89	4	1	9	1	7	38	24	25	32	1	**235**
Period End	**19**	**763**	**40**	**25**	**87**	**10**	**59**	**372**	**223**	**217**	**251**	**24**	**2090**

Heavies

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Edward St*			*New Illawarra*			*Barnsbury Gr*			
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1600 - 1615	0	1	0	0	0	0	0	2	0	1	0	0	**4**
1615 - 1630	0	2	0	0	0	0	0	2	0	5	0	0	**9**
1630 - 1645	0	0	0	0	0	0	0	2	0	0	0	0	**2**
1645 - 1700	0	2	0	0	0	0	0	1	0	2	0	0	**5**
1700 - 1715	0	0	0	0	0	0	0	1	0	0	0	0	**1**
1715 - 1730	0	1	0	0	0	0	0	2	0	2	0	0	**5**
1730 - 1745	0	0	0	0	0	0	0	1	0	0	0	0	**1**
1745 - 1800	0	1	0	0	0	0	0	2	0	2	0	0	**5**
Period End	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**13**	**0**	**12**	**0**	**0**	**32**

Lights

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Edward St*			*New Illawarra*			*Barnsbury Gr*			
Peak Time	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1600 - 1700	8	386	18	18	39	5	36	189	113	113	112	10	**1047**
1615 - 1715	7	375	16	10	39	5	28	182	124	106	113	9	**1014**
1630 - 1730	6	385	17	9	39	7	21	199	121	98	120	11	**1033**
1645 - 1745	9	384	19	8	49	6	22	206	122	103	126	14	**1068**
1700 - 1800	11	377	22	7	48	5	23	183	110	104	139	14	**1043**
PEAK HOUR	**9**	**384**	**19**	**8**	**49**	**6**	**22**	**206**	**122**	**103**	**126**	**14**	**1068**

Heavies

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Edward St*			*New Illawarra*			*Barnsbury Gr*			
Peak Time	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1600 - 1700	0	5	0	0	0	0	0	7	0	8	0	0	**20**
1615 - 1715	0	4	0	0	0	0	0	6	0	7	0	0	**17**
1630 - 1730	0	3	0	0	0	0	0	6	0	4	0	0	**13**
1645 - 1745	0	3	0	0	0	0	0	5	0	4	0	0	**12**
1700 - 1800	0	2	0	0	0	0	0	6	0	4	0	0	**12**
PEAK HOUR	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**4**	**0**	**0**	**12**

Combined

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Edward St*			*New Illawarra*			*Barnsbury Gr*			
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1600 - 1615	3	104	8	10	9	1	15	52	21	37	28	3	**291**
1615 - 1630	3	91	5	3	17	1	11	36	32	31	34	4	**268**
1630 - 1645	0	98	4	3	3	1	4	46	24	27	31	2	**243**
1645 - 1700	2	98	1	2	10	2	6	62	36	26	19	1	**265**
1700 - 1715	2	92	6	2	9	1	7	44	32	29	29	2	**255**
1715 - 1730	2	100	6	2	17	3	4	53	29	20	41	6	**283**
1730 - 1745	3	97	6	2	13	0	5	52	25	32	37	5	**277**
1745 - 1800	4	90	4	1	9	1	7	40	24	27	32	1	**240**
Period End	**19**	**770**	**40**	**25**	**87**	**10**	**59**	**385**	**223**	**229**	**251**	**24**	**2122**

Peds

	NORTH	WEST	SOUTH	EAST	
	New Illawarra	*Edward St*	*New Illawarra*	*Barnsbury Gr*	
Time Per	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**TOT**
1600 - 1615	0	5	2	0	**7**
1615 - 1630	0	4	0	0	**4**
1630 - 1645	0	4	0	0	**4**
1645 - 1700	0	11	0	0	**11**
1700 - 1715	0	4	1	1	**6**
1715 - 1730	0	4	0	2	**6**
1730 - 1745	0	2	1	0	**3**
1745 - 1800	0	5	0	0	**5**
Period End	**0**	**39**	**4**	**3**	**46**

Combined

	NORTH			WEST			SOUTH			EAST			
	New Illawarra			*Edward St*			*New Illawarra*			*Barnsbury Gr*			
Peak Time	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**TOT**
1600 - 1700	8	391	18	18	39	5	36	196	113	121	112	10	**1067**
1615 - 1715	7	379	16	10	39	5	28	188	124	113	113	9	**1031**
1630 - 1730	6	388	17	9	39	7	21	205	121	102	120	11	**1046**
1645 - 1745	9	387	19	8	49	6	22	211	122	107	126	14	**1080**
1700 - 1800	11	379	22	7	48	5	23	189	110	108	139	14	**1055**
PEAK HOUR	**9**	**387**	**19**	**8**	**49**	**6**	**22**	**211**	**122**	**107**	**126**	**14**	**1080**

Peds

	NORTH	WEST	SOUTH	EAST	
	New Illawarra	*Edward St*	*New Illawarra*	*Barnsbury Gr*	
Peak Per	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**UNCLASSIFIED**	**TOT**
1600 - 1700	0	24	2	0	**26**
1615 - 1715	0	23	1	1	**25**
1630 - 1730	0	23	1	3	**27**
1645 - 1745	0	21	2	3	**26**
1700 - 1800	0	15	2	3	**20**
PEAK HR	**0**	**21**	**2**	**3**	**26**

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 6389 BEXLEY NTH Bexley Rd
Day/Date : Tuesday 14th March 2017

Lights

	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Slip Lane*			*Bexley Rd*			*Sarsfield Cct*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0715	1	154	53	0	0	0	1	236	0	9	0	0	**454**
0715 - 0730	0	149	34	0	0	0	0	227	0	2	0	0	**412**
0730 - 0745	1	167	50	0	0	0	0	302	0	1	0	0	**521**
0745 - 0800	0	163	77	0	0	0	0	279	0	3	0	0	**522**
0800 - 0815	1	166	73	0	0	0	0	266	0	8	0	0	**514**
0815 - 0830	2	201	90	0	0	0	2	281	0	0	0	0	**576**
0830 - 0845	0	223	93	0	0	0	0	262	0	8	0	0	**586**
0845 - 0900	0	165	69	0	0	0	0	223	0	5	0	0	**462**
Period End	**5**	**1388**	**539**	**0**	**0**	**0**	**3**	**2076**	**0**	**36**	**0**	**0**	**4047**

Heavies

	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Slip Lane*			*Bexley Rd*			*Sarsfield Cct*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0715	0	6	0	0	0	0	0	6	0	0	0	0	**12**
0715 - 0730	1	4	0	0	0	0	0	3	0	0	0	0	**8**
0730 - 0745	0	4	1	0	0	0	0	8	0	0	0	0	**13**
0745 - 0800	0	3	1	0	0	0	0	4	0	0	0	0	**8**
0800 - 0815	0	5	1	0	0	0	0	3	0	0	0	0	**9**
0815 - 0830	0	4	1	0	0	0	0	2	0	0	0	0	**7**
0830 - 0845	0	4	2	0	0	0	0	5	0	0	0	0	**11**
0845 - 0900	0	6	0	0	0	0	0	5	0	0	0	0	**11**
Period End	**1**	**36**	**6**	**0**	**0**	**0**	**0**	**36**	**0**	**0**	**0**	**0**	**79**

Lights

	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Slip Lane*			*Bexley Rd*			*Sarsfield Cct*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0800	2	633	214	0	0	0	1	1044	0	15	0	0	**1909**
0715 - 0815	2	645	234	0	0	0	0	1074	0	14	0	0	**1969**
0730 - 0830	4	697	290	0	0	0	2	1128	0	12	0	0	**2133**
0745 - 0845	3	753	333	0	0	0	2	1088	0	19	0	0	**2198**
0800 - 0900	3	755	325	0	0	0	2	1032	0	21	0	0	**2138**
PEAK HOUR	**3**	**753**	**333**	**0**	**0**	**0**	**2**	**1088**	**0**	**19**	**0**	**0**	**2198**

Heavies

	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Slip Lane*			*Bexley Rd*			*Sarsfield Cct*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0800	1	17	2	0	0	0	0	21	0	0	0	0	**41**
0715 - 0815	1	16	3	0	0	0	0	18	0	0	0	0	**38**
0730 - 0830	0	16	4	0	0	0	0	17	0	0	0	0	**37**
0745 - 0845	0	16	5	0	0	0	0	14	0	0	0	0	**35**
0800 - 0900	0	19	4	0	0	0	0	15	0	0	0	0	**38**
PEAK HOUR	**0**	**16**	**5**	**0**	**0**	**0**	**0**	**14**	**0**	**0**	**0**	**0**	**35**

Combined

	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Slip Lane*			*Bexley Rd*			*Sarsfield Cct*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0715	1	160	53	0	0	0	1	242	0	9	0	0	**466**
0715 - 0730	1	153	34	0	0	0	0	230	0	2	0	0	**420**
0730 - 0745	1	171	51	0	0	0	0	310	0	1	0	0	**534**
0745 - 0800	0	166	78	0	0	0	0	283	0	3	0	0	**530**
0800 - 0815	1	171	74	0	0	0	0	269	0	8	0	0	**523**
0815 - 0830	2	205	91	0	0	0	2	283	0	0	0	0	**583**
0830 - 0845	0	227	95	0	0	0	0	267	0	8	0	0	**597**
0845 - 0900	0	171	69	0	0	0	0	228	0	5	0	0	**473**
Period End	**6**	**1424**	**545**	**0**	**0**	**0**	**3**	**2112**	**0**	**36**	**0**	**0**	**4126**

Peds

	NORTH	WEST	SOUTH	EAST	
	Bexley Rd	*Slip Lane*	*Bexley Rd*	*Sarsfield Cct*	
Time Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
0700 - 0715	1	0	0	4	**5**
0715 - 0730	0	4	1	6	**11**
0730 - 0745	0	6	0	5	**11**
0745 - 0800	0	5	0	9	**14**
0800 - 0815	0	6	2	7	**15**
0815 - 0830	0	3	1	5	**9**
0830 - 0845	0	4	2	6	**12**
0845 - 0900	0	1	1	7	**9**
Period End	**1**	**29**	**7**	**49**	**86**

Combined

	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Slip Lane*			*Bexley Rd*			*Sarsfield Cct*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0800	3	650	216	0	0	0	1	1065	0	15	0	0	**1950**
0715 - 0815	3	661	237	0	0	0	0	1092	0	14	0	0	**2007**
0730 - 0830	4	713	294	0	0	0	2	1145	0	12	0	0	**2170**
0745 - 0845	3	769	338	0	0	0	2	1102	0	19	0	0	**2233**
0800 - 0900	3	774	329	0	0	0	2	1047	0	21	0	0	**2176**
PEAK HOUR	**3**	**769**	**338**	**0**	**0**	**0**	**2**	**1102**	**0**	**19**	**0**	**0**	**2233**

Peds

	NORTH	WEST	SOUTH	EAST	
	Bexley Rd	*Slip Lane*	*Bexley Rd*	*Sarsfield Cct*	
Peak Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
0700 - 0800	1	15	1	24	**41**
0715 - 0815	0	21	3	27	**51**
0730 - 0830	0	20	3	26	**49**
0745 - 0845	0	18	5	27	**50**
0800 - 0900	0	14	6	25	**45**
PEAK HR	**0**	**18**	**5**	**27**	**50**

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning

Job No/Name : 6389 BEXLEY NTH Bexley Rd

Day/Date : Tuesday 14th March 2017

Lights	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Slip Lane*			*Bexley Rd*			*Sarsfield Cct*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1600 - 1615	2	186	103	0	0	0	1	296	0	4	0	0	**592**
1615 - 1630	2	176	98	0	0	0	0	262	0	11	0	0	**549**
1630 - 1645	0	219	100	0	0	0	2	272	0	4	0	0	**597**
1645 - 1700	3	197	107	0	0	0	2	235	0	6	0	0	**550**
1700 - 1715	1	187	109	0	0	0	0	241	0	6	0	0	**544**
1715 - 1730	0	165	103	0	0	0	0	246	0	8	0	0	**522**
1730 - 1745	1	193	111	0	0	0	0	276	0	11	0	0	**592**
1745 - 1800	1	190	115	0	0	0	0	270	0	10	0	0	**586**
Period End	**10**	**1513**	**846**	**0**	**0**	**0**	**5**	**2098**	**0**	**60**	**0**	**0**	**4532**

Heavies	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Slip Lane*			*Bexley Rd*			*Sarsfield Cct*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1600 - 1615	0	4	1	0	0	0	0	5	0	0	0	0	**10**
1615 - 1630	0	6	2	0	0	0	0	3	0	0	0	0	**11**
1630 - 1645	0	3	1	0	0	0	0	1	0	0	0	0	**5**
1645 - 1700	0	4	1	0	0	0	0	3	0	0	0	0	**8**
1700 - 1715	0	1	0	0	0	0	0	4	0	0	0	0	**5**
1715 - 1730	0	6	1	0	0	0	0	2	0	0	0	0	**9**
1730 - 1745	0	5	1	0	0	0	0	4	0	0	0	0	**10**
1745 - 1800	0	3	0	0	0	0	0	5	0	0	0	0	**8**
Period End	**0**	**32**	**7**	**0**	**0**	**0**	**0**	**27**	**0**	**0**	**0**	**0**	**66**

Lights	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Slip Lane*			*Bexley Rd*			*Sarsfield Cct*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1600 - 1700	7	778	408	0	0	0	5	1065	0	25	0	0	**2288**
1615 - 1715	6	779	414	0	0	0	4	1010	0	27	0	0	**2240**
1630 - 1730	4	768	419	0	0	0	4	994	0	24	0	0	**2213**
1645 - 1745	5	742	430	0	0	0	2	998	0	31	0	0	**2208**
1700 - 1800	3	735	438	0	0	0	0	1033	0	35	0	0	**2244**
PEAK HOUR	**3**	**735**	**438**	**0**	**0**	**0**	**0**	**1033**	**0**	**35**	**0**	**0**	**2244**

Heavies	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Slip Lane*			*Bexley Rd*			*Sarsfield Cct*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1600 - 1700	0	17	5	0	0	0	0	12	0	0	0	0	**34**
1615 - 1715	0	14	4	0	0	0	0	11	0	0	0	0	**29**
1630 - 1730	0	14	3	0	0	0	0	10	0	0	0	0	**27**
1645 - 1745	0	16	3	0	0	0	0	13	0	0	0	0	**32**
1700 - 1800	0	15	2	0	0	0	0	15	0	0	0	0	**32**
PEAK HOUR	**0**	**15**	**2**	**0**	**0**	**0**	**0**	**15**	**0**	**0**	**0**	**0**	**32**

Combined	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Slip Lane*			*Bexley Rd*			*Sarsfield Cct*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1600 - 1615	2	190	104	0	0	0	1	301	0	4	0	0	**602**
1615 - 1630	2	182	100	0	0	0	0	265	0	11	0	0	**560**
1630 - 1645	0	222	101	0	0	0	2	273	0	4	0	0	**602**
1645 - 1700	3	201	108	0	0	0	2	238	0	6	0	0	**558**
1700 - 1715	1	188	109	0	0	0	0	245	0	6	0	0	**549**
1715 - 1730	0	171	104	0	0	0	0	248	0	8	0	0	**531**
1730 - 1745	1	198	112	0	0	0	0	280	0	11	0	0	**602**
1745 - 1800	1	193	115	0	0	0	0	275	0	10	0	0	**594**
Period End	**10**	**1545**	**853**	**0**	**0**	**0**	**5**	**2125**	**0**	**60**	**0**	**0**	**4598**

Peds	NORTH	WEST	SOUTH	EAST	
	Bexley Rd	*Slip Lane*	*Bexley Rd*	*Sarsfield Cct*	
Time Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
1600 - 1615	0	3	0	5	**8**
1615 - 1630	0	2	1	3	**6**
1630 - 1645	0	1	1	9	**11**
1645 - 1700	0	0	0	6	**6**
1700 - 1715	0	4	2	8	**14**
1715 - 1730	0	3	3	3	**9**
1730 - 1745	0	1	2	8	**11**
1745 - 1800	0	1	1	3	**5**
Period End	**0**	**15**	**10**	**45**	**70**

Combined	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Slip Lane*			*Bexley Rd*			*Sarsfield Cct*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1600 - 1700	7	795	413	0	0	0	5	1077	0	25	0	0	**2322**
1615 - 1715	6	793	418	0	0	0	4	1021	0	27	0	0	**2269**
1630 - 1730	4	782	422	0	0	0	4	1004	0	24	0	0	**2240**
1645 - 1745	5	758	433	0	0	0	2	1011	0	31	0	0	**2240**
1700 - 1800	3	750	440	0	0	0	0	1048	0	35	0	0	**2276**
PEAK HOUR	**3**	**750**	**440**	**0**	**0**	**0**	**0**	**1048**	**0**	**35**	**0**	**0**	**2276**

Peds	NORTH	WEST	SOUTH	EAST	
	Bexley Rd	*Slip Lane*	*Bexley Rd*	*Sarsfield Cct*	
Peak Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
1600 - 1700	0	6	2	23	**31**
1615 - 1715	0	7	4	26	**37**
1630 - 1730	0	8	6	26	**40**
1645 - 1745	0	8	7	25	**40**
1700 - 1800	0	9	8	22	**39**
PEAK HR	**0**	**9**	**8**	**22**	**39**

R.O.A.R. DATA

Reliable, Original & Authentic Results

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Client : Varga Traffic Planning

Job No/Name : 6389 BEXLEY NTH Bexley Rd

Day/Date : Tuesday 14th March 2017

Lights	NORTH		WEST		SOUTH		
	Bexley Rd		Demaine		Bexley Rd		
Time Per	T	R	L	R	L	T	TOT
0700 - 0715	185	0	2	0	0	317	**504**
0715 - 0730	171	0	17	0	1	348	**537**
0730 - 0745	272	0	14	0	1	371	**658**
0745 - 0800	245	0	44	0	0	387	**676**
0800 - 0815	268	0	38	0	1	409	**716**
0815 - 0830	292	0	29	0	1	353	**675**
0830 - 0845	285	2	21	1	0	346	**655**
0845 - 0900	251	0	16	0	2	316	**585**
Per End	**1969**	**2**	**181**	**1**	**6**	**2847**	**5006**

Heavies	NORTH		WEST		SOUTH		
	Bexley Rd		Demaine		Bexley Rd		
Time Per	T	R	L	R	L	T	TOT
0700 - 0715	6	0	0	0	0	8	**14**
0715 - 0730	5	0	0	0	0	5	**10**
0730 - 0745	6	0	0	0	0	14	**20**
0745 - 0800	3	0	0	0	0	8	**11**
0800 - 0815	7	0	0	0	0	5	**12**
0815 - 0830	4	0	0	0	0	6	**10**
0830 - 0845	6	0	0	0	0	6	**12**
0845 - 0900	5	0	0	0	0	7	**12**
Per End	**42**	**0**	**0**	**0**	**0**	**59**	**101**

Combined	NORTH		WEST		SOUTH		
	Bexley Rd		Demaine		Bexley Rd		
Time Per	T	R	L	R	L	T	TOT
0700 - 0715	191	0	2	0	0	325	**518**
0715 - 0730	176	0	17	0	1	353	**547**
0730 - 0745	278	0	14	0	1	385	**678**
0745 - 0800	248	0	44	0	0	395	**687**
0800 - 0815	275	0	38	0	1	414	**728**
0815 - 0830	296	0	29	0	1	359	**685**
0830 - 0845	291	2	21	1	0	352	**667**
0845 - 0900	256	0	16	0	2	323	**597**
Per End	**2011**	**2**	**181**	**1**	**6**	**2906**	**5107**

Lights	NORTH		WEST		SOUTH		
	Bexley Rd		Demaine		Bexley Rd		
Peak Per	T	R	L	R	L	T	TOT
0700 - 0800	873	0	77	0	2	1423	**2375**
0715 - 0815	956	0	113	0	3	1515	2587
0730 - 0830	1077	0	125	0	3	1520	**2725**
0745 - 0845	1090	2	132	1	2	1495	**2722**
0800 - 0900	1096	2	104	1	4	1424	**2631**
PEAK HR	**1077**	**0**	**125**	**0**	**3**	**1520**	**2725**

Heavies	NORTH		WEST		SOUTH		
	Bexley Rd		Demaine		Bexley Rd		
Peak Per	T	R	L	R	L	T	TOT
0700 - 0800	20	0	0	0	0	35	**55**
0715 - 0815	21	0	0	0	0	32	53
0730 - 0830	20	0	0	0	0	33	**53**
0745 - 0845	20	0	0	0	0	25	**45**
0800 - 0900	22	0	0	0	0	24	**46**
PEAK HR	**20**	**0**	**0**	**0**	**0**	**33**	**53**

Combined	NORTH		WEST		SOUTH		
	Bexley Rd		Demaine		Bexley Rd		
Peak Per	T	R	L	R	L	T	TOT
0700 - 0800	893	0	77	0	2	1458	**2430**
0715 - 0815	977	0	113	0	3	1547	2640
0730 - 0830	1097	0	125	0	3	1553	**2778**
0745 - 0845	1110	2	132	1	2	1520	**2767**
0800 - 0900	1118	2	104	1	4	1448	**2677**
PEAK HR	**1097**	**0**	**125**	**0**	**3**	**1553**	**2778**

Peds	NORTH	WEST	SOUTH	
Time Per	Bexley Rd	Demaine	Bexley Rd	TOT
0700 - 0715	1	3	0	**4**
0715 - 0730	0	10	0	**10**
0730 - 0745	0	25	0	**25**
0745 - 0800	0	26	0	**26**
0800 - 0815	0	41	0	**41**
0815 - 0830	0	21	0	**21**
0830 - 0845	0	16	0	**16**
0845 - 0900	3	17	0	**20**
Per End	**4**	**159**	**0**	**163**

	NORTH	WEST	SOUTH	
Peak Per	Bexley Rd	Demaine	Bexley Rd	TOT
0700 - 0800	1	64	0	**65**
0715 - 0815	0	102	0	**102**
0730 - 0830	0	113	0	**113**
0745 - 0845	0	104	0	**104**
0800 - 0900	3	95	0	**98**
PEAK HR	**0**	**113**	**0**	**113**

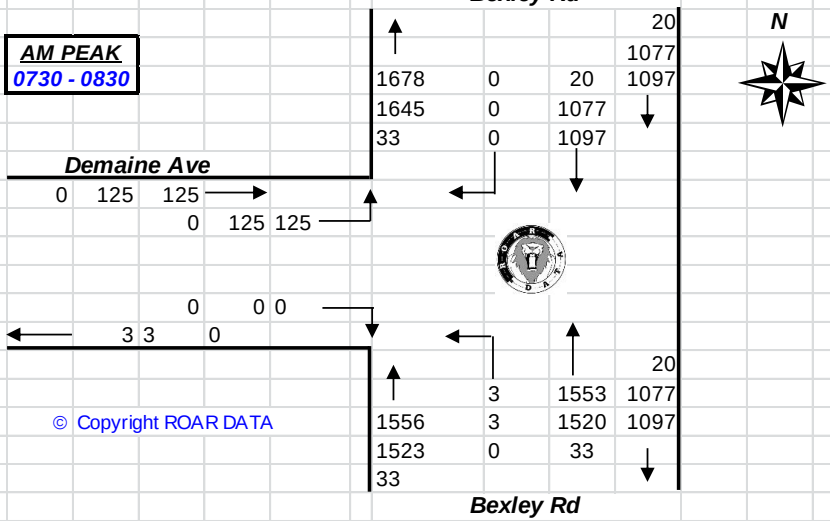
Hours 1

Hours 2

Hours 3

Hours 4

Hours 5



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning

Job No/Name : 6389 BEXLEY NTH Bexley Rd

Day/Date : Tuesday 14th March 2017

Lights	NORTH		WEST		SOUTH		
	Bexley Rd		*Demaine*		*Bexley Rd*		
Time Per	T	R	L	R	L	T	TOT
1600 - 1615	290	0	3	0	3	360	**656**
1615 - 1630	269	0	2	0	3	318	**592**
1630 - 1645	305	0	4	0	1	308	**618**
1645 - 1700	303	0	3	0	2	345	**653**
1700 - 1715	295	0	5	0	2	282	**584**
1715 - 1730	297	0	2	0	0	334	**633**
1730 - 1745	285	0	2	0	2	382	**671**
1745 - 1800	309	0	3	0	4	306	**622**
Per End	**2353**	**0**	**24**	**0**	**17**	**2635**	**5029**

Heavies	NORTH		WEST		SOUTH		
	Bexley Rd		*Demaine*		*Bexley Rd*		
Time Per	T	R	L	R	L	T	TOT
1600 - 1615	4	0	0	0	0	7	**11**
1615 - 1630	9	0	0	0	0	5	**14**
1630 - 1645	4	0	0	0	0	3	**7**
1645 - 1700	5	0	0	0	0	4	**9**
1700 - 1715	1	0	0	0	0	6	**7**
1715 - 1730	7	0	0	0	0	4	**11**
1730 - 1745	3	0	0	0	0	6	**9**
1745 - 1800	7	0	0	0	0	5	**12**
Per End	**40**	**0**	**0**	**0**	**0**	**40**	**80**

Combined	NORTH		WEST		SOUTH		
	Bexley Rd		*Demaine*		*Bexley Rd*		
Time Per	T	R	L	R	L	T	TOT
1600 - 1615	294	0	3	0	3	367	**667**
1615 - 1630	278	0	2	0	3	323	**606**
1630 - 1645	309	0	4	0	1	311	**625**
1645 - 1700	308	0	3	0	2	349	**662**
1700 - 1715	296	0	5	0	2	288	**591**
1715 - 1730	304	0	2	0	0	338	**644**
1730 - 1745	288	0	2	0	2	388	**680**
1745 - 1800	316	0	3	0	4	311	**634**
Per End	**2393**	**0**	**24**	**0**	**17**	**2675**	**5109**

Lights	NORTH		WEST		SOUTH		
	Bexley Rd		*Demaine*		*Bexley Rd*		
Peak Per	T	R	L	R	L	T	TOT
1600 - 1700	1167	0	12	0	9	1331	**2519**
1615 - 1715	1172	0	14	0	8	1253	**2447**
1630 - 1730	1200	0	14	0	5	1269	**2488**
1645 - 1745	1180	0	12	0	6	1343	**2541**
1700 - 1800	1186	0	12	0	8	1304	**2510**
PEAK HR	**1180**	**0**	**12**	**0**	**6**	**1343**	

Heavies	NORTH		WEST		SOUTH		
	Bexley Rd		*Demaine*		*Bexley Rd*		
Peak Per	T	R	L	R	L	T	TOT
1600 - 1700	22	0	0	0	0	19	**41**
1615 - 1715	19	0	0	0	0	18	**37**
1630 - 1730	17	0	0	0	0	17	**34**
1645 - 1745	16	0	0	0	0	20	**36**
1700 - 1800	18	0	0	0	0	21	**39**
PEAK HR	**16**	**0**	**0**	**0**	**0**	**20**	**36**

Combined	NORTH		WEST		SOUTH		
	Bexley Rd		*Demaine*		*Bexley Rd*		
Peak Per	T	R	L	R	L	T	TOT
1600 - 1700	1189	0	12	0	9	1350	**2560**
1615 - 1715	1191	0	14	0	8	1271	**2484**
1630 - 1730	1217	0	14	0	5	1286	**2522**
1645 - 1745	1196	0	12	0	6	1363	**2577**
1700 - 1800	1204	0	12	0	8	1325	**2549**
PEAK HR	**1196**	**0**	**12**	**0**	**6**	**1363**	**2577**

Peds	NORTH	WEST	SOUTH	
Time Per	Bexley Rd	Demaine	Bexley Rd	TOT
1600 - 1615	0	8	0	**8**
1615 - 1630	0	9	1	**10**
1630 - 1645	0	11	0	**11**
1645 - 1700	0	21	0	**21**
1700 - 1715	0	14	0	**14**
1715 - 1730	0	13	0	**13**
1730 - 1745	0	26	0	**26**
1745 - 1800	0	27	0	**27**
Per End	**0**	**129**	**1**	**130**

	NORTH	WEST	SOUTH	
Peak Per	Bexley Rd	Demaine	Bexley Rd	TOT
1600 - 1700	0	49	1	**50**
1615 - 1715	0	55	1	**56**
1630 - 1730	0	59	0	**59**
1645 - 1745	0	74	0	**74**
1700 - 1800	0	80	0	**80**
PEAK HR	**0**	**74**	**0**	**74**

Hours 1

Hours 2

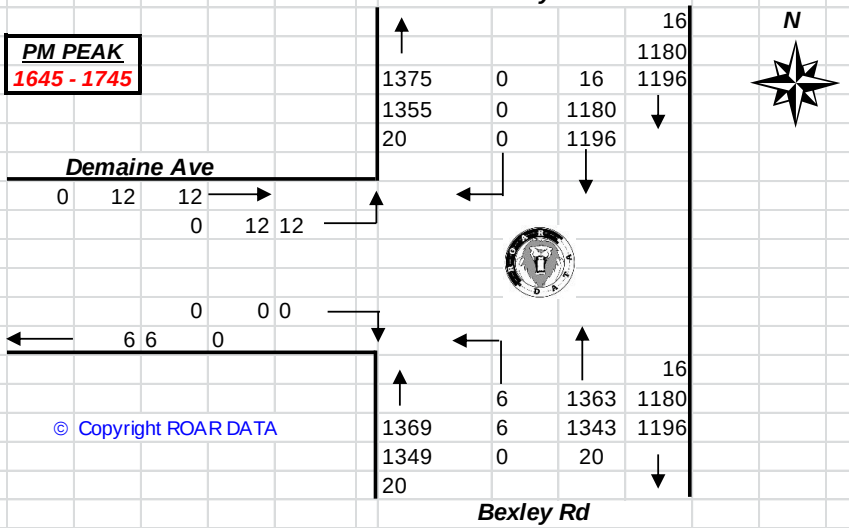
Hours 3

Hours 4

Hours 5

PM PEAK

1645 - 1745



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning

Job No/Name : 6389 BEXLEY NTH Bexley Rd

Day/Date : Tuesday 14th March 2017

Lights	NORTH		EAST		SOUTH		
	New		*Slip Lane*		*New*		
Time Per	T	L	R	L	R	T	TOT
0700 - 0715	0	0	0	46	0	98	**144**
0715 - 0730	0	0	0	37	0	102	**139**
0730 - 0745	0	0	0	45	0	63	**108**
0745 - 0800	0	0	0	80	0	78	**158**
0800 - 0815	0	0	0	68	0	75	**143**
0815 - 0830	0	0	0	88	0	78	**166**
0830 - 0845	0	0	0	75	0	67	**142**
0845 - 0900	0	0	0	72	0	74	**146**
Per End	**0**	**0**	**0**	**511**	**0**	**635**	**1146**

Heavies	NORTH		EAST		SOUTH		
	New		*Slip Lane*		*New*		
Time Per	T	L	R	L	R	T	TOT
0700 - 0715	0	0	0	2	0	2	**4**
0715 - 0730	0	0	0	0	0	2	**2**
0730 - 0745	0	0	0	2	0	6	**8**
0745 - 0800	0	0	0	1	0	4	**5**
0800 - 0815	0	0	0	2	0	1	**3**
0815 - 0830	0	0	0	1	0	3	**4**
0830 - 0845	0	0	0	2	0	1	**3**
0845 - 0900	0	0	0	1	0	3	**4**
Per End	**0**	**0**	**0**	**11**	**0**	**22**	**33**

Combined	NORTH		EAST		SOUTH		
	New		*Slip Lane*		*New*		
Time Per	T	L	R	L	R	T	TOT
0700 - 0715	0	0	0	48	0	100	**148**
0715 - 0730	0	0	0	37	0	104	**141**
0730 - 0745	0	0	0	47	0	69	**116**
0745 - 0800	0	0	0	81	0	82	**163**
0800 - 0815	0	0	0	70	0	76	**146**
0815 - 0830	0	0	0	89	0	81	**170**
0830 - 0845	0	0	0	77	0	68	**145**
0845 - 0900	0	0	0	73	0	77	**150**
Per End	**0**	**0**	**0**	**522**	**0**	**657**	**1179**

Lights	NORTH		EAST		SOUTH		
	New		*Slip Lane*		*New*		
Peak Per	T	L	R	L	R	T	TOT
0700 - 0800	0	0	0	208	0	341	**549**
0715 - 0815	0	0	0	230	0	318	**548**
0730 - 0830	0	0	0	281	0	294	**575**
0745 - 0845	0	0	0	311	0	298	**609**
0800 - 0900	0	0	0	303	0	294	**597**
PEAK HR	**0**	**0**	**0**	**311**	**0**	**298**	**609**

Heavies	NORTH		EAST		SOUTH		
	New		*Slip Lane*		*New*		
Peak Per	T	L	R	L	R	T	TOT
0700 - 0800	0	0	0	5	0	14	**19**
0715 - 0815	0	0	0	5	0	13	**18**
0730 - 0830	0	0	0	6	0	14	**20**
0745 - 0845	0	0	0	6	0	9	**15**
0800 - 0900	0	0	0	6	0	8	**14**
PEAK HR	**0**	**0**	**0**	**6**	**0**	**9**	**15**

Combined	NORTH		EAST		SOUTH		
	New		*Slip Lane*		*New*		
Peak Per	T	L	R	L	R	T	TOT
0700 - 0800	0	0	0	213	0	355	**568**
0715 - 0815	0	0	0	235	0	331	**566**
0730 - 0830	0	0	0	287	0	308	**595**
0745 - 0845	0	0	0	317	0	307	**624**
0800 - 0900	0	0	0	309	0	302	**611**
PEAK HR	**0**	**0**	**0**	**317**	**0**	**307**	**624**

Peds	NORTH	EAST	SOUTH	
Time Per	New	Slip Lane	New	TOT
0700 - 0715	0	1	1	**2**
0715 - 0730	1	0	0	**1**
0730 - 0745	0	0	1	**1**
0745 - 0800	1	1	0	**2**
0800 - 0815	0	1	0	**1**
0815 - 0830	0	0	0	**0**
0830 - 0845	1	0	1	**2**
0845 - 0900	0	0	1	**1**
Per End	**3**	**3**		**10**

	NORTH	EAST	SOUTH	
Peak Per	New	Slip Lane	New	TOT
0700 - 0800	2	2	2	**6**
0715 - 0815	2	2	1	**5**
0730 - 0830	1	2	1	**4**
0745 - 0845	2	2	1	**5**
0800 - 0900	1	1	2	**4**
PEAK HR	**2**	**2**	**1**	**5**

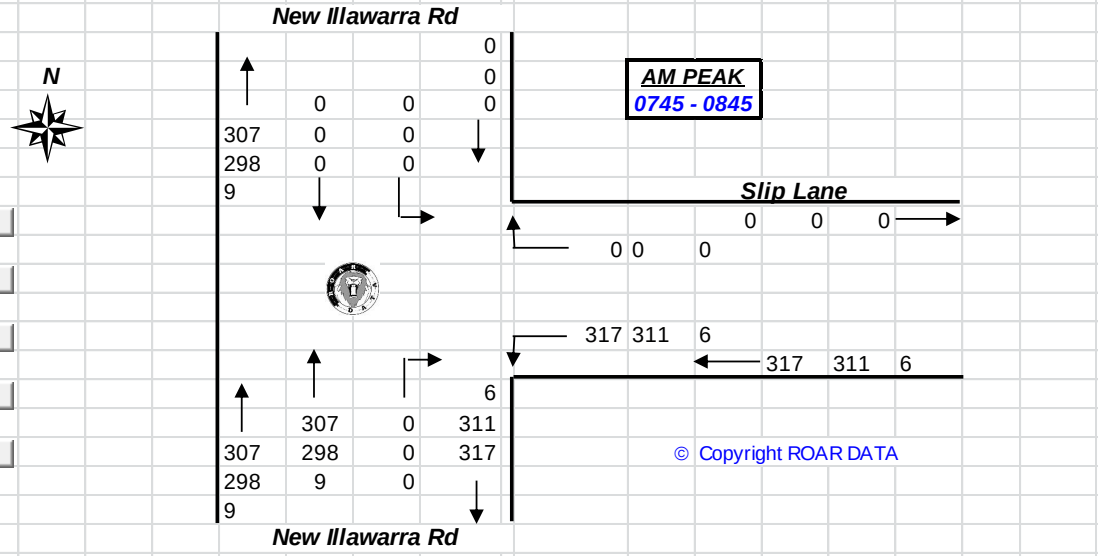
Hours 1

Hours 2

Hours 3

Hours 4

Hours 5



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning

Job No/Name : 6389 BEXLEY NTH Bexley Rd

Day/Date : Tuesday 14th March 2017

Lights	NORTH		EAST		SOUTH		
	New		*Slip Lane*		*New*		
Time Per	T	L	R	L	R	T	TOT
1600 - 1615	0	0	0	105	0	54	**159**
1615 - 1630	0	0	0	97	0	39	**136**
1630 - 1645	0	0	0	107	0	41	**148**
1645 - 1700	0	0	0	110	0	60	**170**
1700 - 1715	0	0	0	115	0	47	**162**
1715 - 1730	0	0	0	111	0	48	**159**
1730 - 1745	0	0	0	112	0	51	**163**
1745 - 1800	0	0	0	106	0	42	**148**
Per End	**0**	**0**	**0**	**863**	**0**	**382**	**1245**

Heavies	NORTH		EAST		SOUTH		
	New		*Slip Lane*		*New*		
Time Per	T	L	R	L	R	T	TOT
1600 - 1615	0	0	0	1	0	2	**3**
1615 - 1630	0	0	0	2	0	2	**4**
1630 - 1645	0	0	0	2	0	2	**4**
1645 - 1700	0	0	0	0	0	1	**1**
1700 - 1715	0	0	0	0	0	2	**2**
1715 - 1730	0	0	0	1	0	2	**3**
1730 - 1745	0	0	0	0	0	1	**1**
1745 - 1800	0	0	0	1	0	2	**3**
Per End	**0**	**0**	**0**	**7**	**0**	**14**	**21**

Combined	NORTH		EAST		SOUTH		
	New		*Slip Lane*		*New*		
Time Per	T	L	R	L	R	T	TOT
1600 - 1615	0	0	0	106	0	56	**162**
1615 - 1630	0	0	0	99	0	41	**140**
1630 - 1645	0	0	0	109	0	43	**152**
1645 - 1700	0	0	0	110	0	61	**171**
1700 - 1715	0	0	0	115	0	49	**164**
1715 - 1730	0	0	0	112	0	50	**162**
1730 - 1745	0	0	0	112	0	52	**164**
1745 - 1800	0	0	0	107	0	44	**151**
Per End	**0**	**0**	**0**	**870**	**0**	**396**	**1266**

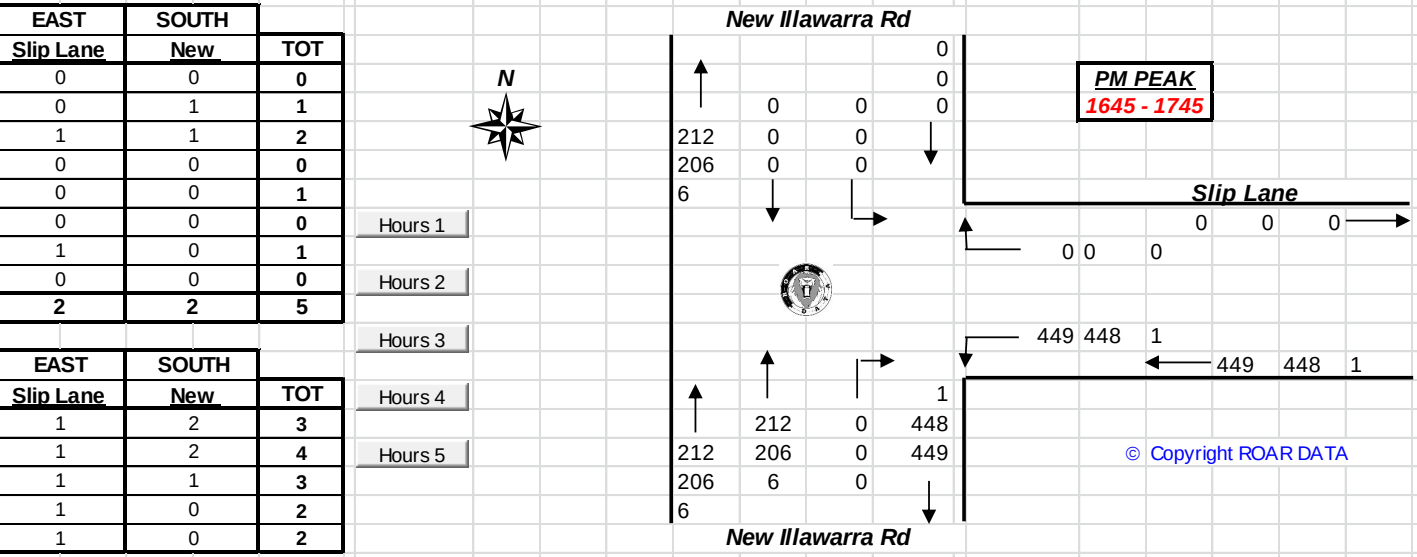
Lights	NORTH		EAST		SOUTH		
	New		*Slip Lane*		*New*		
Peak Per	T	L	R	L	R	T	TOT
1600 - 1700	0	0	0	419	0	194	**613**
1615 - 1715	0	0	0	429	0	187	**616**
1630 - 1730	0	0	0	443	0	196	**639**
1645 - 1745	0	0	0	448	0	206	**654**
1700 - 1800	0	0	0	444	0	188	**632**
PEAK HR	**0**	**0**	**0**	**448**	**0**	**206**	**654**

Heavies	NORTH		EAST		SOUTH		
	New		*Slip Lane*		*New*		
Peak Per	T	L	R	L	R	T	TOT
1600 - 1700	0	0	0	5	0	7	**12**
1615 - 1715	0	0	0	4	0	7	**11**
1630 - 1730	0	0	0	3	0	7	**10**
1645 - 1745	0	0	0	1	0	6	**7**
1700 - 1800	0	0	0	2	0	7	**9**
PEAK HR	**0**	**0**	**0**	**1**	**0**	**6**	**7**

Combined	NORTH		EAST		SOUTH		
	New		*Slip Lane*		*New*		
Peak Per	T	L	R	L	R	T	TOT
1600 - 1700	0	0	0	424	0	201	**625**
1615 - 1715	0	0	0	433	0	194	**627**
1630 - 1730	0	0	0	446	0	203	**649**
1645 - 1745	0	0	0	449	0	212	**661**
1700 - 1800	0	0	0	446	0	195	**641**
PEAK HR	**0**	**0**	**0**	**449**	**0**	**212**	**661**

Peds	NORTH	EAST	SOUTH	
Time Per	New	Slip Lane	New	TOT
1600 - 1615	0	0	0	**0**
1615 - 1630	0	0	1	**1**
1630 - 1645	0	1	1	**2**
1645 - 1700	0	0	0	**0**
1700 - 1715	1	0	0	**1**
1715 - 1730	0	0	0	**0**
1730 - 1745	0	1	0	**1**
1745 - 1800	0	0	0	**0**
Per End	**1**	**2**	**2**	**5**

	NORTH	EAST	SOUTH	
Peak Per	New	Slip Lane	New	TOT
1600 - 1700	0	1	2	**3**
1615 - 1715	1	1	2	**4**
1630 - 1730	1	1	1	**3**
1645 - 1745	1	1	0	**2**
1700 - 1800	1	1	0	**2**
PEAK HR	**1**	**1**	**0**	**2**



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning

Job No/Name : 6389 BEXLEY NTH Bexley Rd

Day/Date : Tuesday 14th March 2017

Lights

	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Shaw St*			*Bexley Rd*			*Slade Rd*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0715	26	187	0	17	75	13	14	258	64	14	15	38	**721**
0715 - 0730	36	182	0	22	77	8	28	291	63	8	11	28	**754**
0730 - 0745	23	226	0	24	90	12	12	329	57	26	19	39	**857**
0745 - 0800	25	198	0	26	50	12	10	309	41	20	16	36	**743**
0800 - 0815	16	189	0	28	56	11	8	353	50	32	28	55	**826**
0815 - 0830	38	265	0	23	56	9	3	265	36	23	35	41	**794**
0830 - 0845	23	240	0	27	54	11	7	324	45	32	41	59	**863**
0845 - 0900	21	220	0	23	46	4	14	294	42	35	19	64	**782**
Period End	**208**	**1707**	**0**	**190**	**504**	**80**	**96**	**2423**	**398**	**190**	**184**	**360**	**6340**

Heavies

	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Shaw St*			*Bexley Rd*			*Slade Rd*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0715	0	4	0	1	0	1	1	6	0	1	1	0	**15**
0715 - 0730	1	4	0	0	0	0	2	4	2	1	0	1	**15**
0730 - 0745	1	5	0	0	1	1	0	11	0	0	0	0	**19**
0745 - 0800	2	4	0	0	0	0	1	3	2	1	1	1	**15**
0800 - 0815	1	6	0	0	0	1	0	5	0	0	0	1	**14**
0815 - 0830	1	2	0	0	0	0	1	3	1	1	0	0	**9**
0830 - 0845	0	5	0	0	0	1	0	8	0	0	0	0	**14**
0845 - 0900	2	4	0	0	0	0	1	5	1	1	0	0	**14**
Period End	**8**	**34**	**0**	**1**	**1**	**4**	**6**	**45**	**6**	**5**	**2**	**3**	**115**

Lights

	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Shaw St*			*Bexley Rd*			*Slade Rd*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0800	110	793	0	89	292	45	64	1187	225	68	61	141	**3075**
0715 - 0815	100	795	0	100	273	43	58	1282	211	86	74	158	**3180**
0730 - 0830	102	878	0	101	252	44	33	1256	184	101	98	171	**3220**
0745 - 0845	102	892	0	104	216	43	28	1251	172	107	120	191	**3226**
0800 - 0900	98	914	0	101	212	35	32	1236	173	122	123	219	**3265**
PEAK HOUR	**98**	**914**	**0**	**101**	**212**	**35**	**32**	**1236**	**173**	**122**	**123**	**219**	**3265**

Heavies

	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Shaw St*			*Bexley Rd*			*Slade Rd*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0800	4	17	0	1	1	2	4	24	4	3	2	2	**64**
0715 - 0815	5	19	0	0	1	2	3	23	4	2	1	3	**63**
0730 - 0830	5	17	0	0	1	2	2	22	3	2	1	2	**57**
0745 - 0845	4	17	0	0	0	2	2	19	3	2	1	2	**52**
0800 - 0900	4	17	0	0	0	2	2	21	2	2	0	1	**51**
PEAK HOUR	**4**	**17**	**0**	**0**	**0**	**2**	**2**	**21**	**2**	**2**	**0**	**1**	**51**

Combined

	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Shaw St*			*Bexley Rd*			*Slade Rd*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0715	26	191	0	18	75	14	15	264	64	15	16	38	**736**
0715 - 0730	37	186	0	22	77	8	30	295	65	9	11	29	**769**
0730 - 0745	24	231	0	24	91	13	12	340	57	26	19	39	**876**
0745 - 0800	27	202	0	26	50	12	11	312	43	21	17	37	**758**
0800 - 0815	17	195	0	28	56	12	8	358	50	32	28	56	**840**
0815 - 0830	39	267	0	23	56	9	4	268	37	24	35	41	**803**
0830 - 0845	23	245	0	27	54	12	7	332	45	32	41	59	**877**
0845 - 0900	23	224	0	23	46	4	15	299	43	36	19	64	**796**
Period End	**216**	**1741**	**0**	**191**	**505**	**84**	**102**	**2468**	**404**	**195**	**186**	**363**	**6455**

Peds

	NORTH	WEST	SOUTH	EAST	
	Bexley Rd	*Shaw St*	*Bexley Rd*	*Slade Rd*	
Time Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
0700 - 0715	4	16	14	5	**39**
0715 - 0730	1	32	14	7	**54**
0730 - 0745	9	42	14	2	**67**
0745 - 0800	11	35	12	2	**60**
0800 - 0815	4	26	14	1	**45**
0815 - 0830	15	31	9	2	**57**
0830 - 0845	14	33	16	5	**68**
0845 - 0900	13	24	23	2	**62**
Period End	**71**	**239**	**116**	**26**	**452**

Combined

	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Shaw St*			*Bexley Rd*			*Slade Rd*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0800	114	810	0	90	293	47	68	1211	229	71	63	143	**3139**
0715 - 0815	105	814	0	100	274	45	61	1305	215	88	75	161	**3243**
0730 - 0830	107	895	0	101	253	46	35	1278	187	103	99	173	**3277**
0745 - 0845	106	909	0	104	216	45	30	1270	175	109	121	193	**3278**
0800 - 0900	102	931	0	101	212	37	34	1257	175	124	123	220	**3316**
PEAK HOUR	**102**	**931**	**0**	**101**	**212**	**37**	**34**	**1257**	**175**	**124**	**123**	**220**	**3316**

Peds

	NORTH	WEST	SOUTH	EAST	
	Bexley Rd	*Shaw St*	*Bexley Rd*	*Slade Rd*	
Peak Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
0700 - 0800	25	125	54	16	**220**
0715 - 0815	25	135	54	12	**226**
0730 - 0830	39	134	49	7	**229**
0745 - 0845	44	125	51	10	**230**
0800 - 0900	46	114	62	10	**232**
PEAK HR	**46**	**114**	**62**	**10**	**232**

R.O.A.R. DATA

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Client : Varga Traffic Planning

Job No/Name : 6389 BEXLEY NTH Bexley Rd

Day/Date : Tuesday 14th March 2017

Lights	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Shaw St*			*Bexley Rd*			*Slade Rd*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1600 - 1615	44	174	0	14	24	5	12	307	26	36	34	52	**728**
1615 - 1630	38	211	0	10	27	10	7	275	31	34	38	45	**726**
1630 - 1645	30	257	0	12	22	8	7	279	31	33	47	49	**775**
1645 - 1700	47	264	0	8	22	8	10	267	30	26	45	56	**783**
1700 - 1715	31	212	0	8	23	12	8	240	23	48	57	49	**711**
1715 - 1730	36	227	0	12	37	9	8	285	30	32	49	62	**787**
1730 - 1745	40	241	0	15	45	7	5	316	47	28	51	58	**853**
1745 - 1800	44	273	0	14	30	9	2	259	35	29	37	42	**774**
Period End	**310**	**1859**	**0**	**93**	**230**	**68**	**59**	**2228**	**253**	**266**	**358**	**413**	**6137**

Heavies	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Shaw St*			*Bexley Rd*			*Slade Rd*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1600 - 1615	0	4	0	0	0	1	1	5	1	0	0	1	**13**
1615 - 1630	0	7	0	0	0	0	1	3	1	1	1	0	**14**
1630 - 1645	0	3	0	0	0	1	0	4	0	1	0	0	**9**
1645 - 1700	1	4	0	0	0	0	1	1	1	0	0	0	**8**
1700 - 1715	0	0	0	0	0	1	0	2	0	0	0	0	**3**
1715 - 1730	0	6	0	0	0	0	1	5	2	1	0	0	**15**
1730 - 1745	1	2	0	0	0	1	0	4	0	0	0	0	**8**
1745 - 1800	0	5	0	0	0	0	1	3	2	1	0	0	**12**
Period End	**2**	**31**	**0**	**0**	**0**	**4**	**5**	**27**	**7**	**4**	**1**	**1**	**82**

Lights	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Shaw St*			*Bexley Rd*			*Slade Rd*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1600 - 1700	159	906	0	44	95	31	36	1128	118	129	164	202	**3012**
1615 - 1715	146	944	0	38	94	38	32	1061	115	141	187	199	**2995**
1630 - 1730	144	960	0	40	104	37	33	1071	114	139	198	216	**3056**
1645 - 1745	154	944	0	43	127	36	31	1108	130	134	202	225	**3134**
1700 - 1800	151	953	0	49	135	37	23	1100	135	137	194	211	**3125**
PEAK HOUR	**154**	**944**	**0**	**43**	**127**	**36**	**31**	**1108**	**130**	**134**	**202**	**225**	**3134**

Heavies	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Shaw St*			*Bexley Rd*			*Slade Rd*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1600 - 1700	1	18	0	0	0	2	3	13	3	2	1	1	**44**
1615 - 1715	1	14	0	0	0	2	2	10	2	2	1	0	**34**
1630 - 1730	1	13	0	0	0	2	2	12	3	2	0	0	**35**
1645 - 1745	2	12	0	0	0	2	2	12	3	1	0	0	**34**
1700 - 1800	1	13	0	0	0	2	2	14	4	2	0	0	**38**
PEAK HOUR	**2**	**12**	**0**	**0**	**0**	**2**	**2**	**12**	**3**	**1**	**0**	**0**	**34**

Combined	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Shaw St*			*Bexley Rd*			*Slade Rd*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1600 - 1615	44	178	0	14	24	6	13	312	27	36	34	53	**741**
1615 - 1630	38	218	0	10	27	10	8	278	32	35	39	45	**740**
1630 - 1645	30	260	0	12	22	9	7	283	31	34	47	49	**784**
1645 - 1700	48	268	0	8	22	8	11	268	31	26	45	56	**791**
1700 - 1715	31	212	0	8	23	13	8	242	23	48	57	49	**714**
1715 - 1730	36	233	0	12	37	9	9	290	32	33	49	62	**802**
1730 - 1745	41	243	0	15	45	8	5	320	47	28	51	58	**861**
1745 - 1800	44	278	0	14	30	9	3	262	37	30	37	42	**786**
Period End	**312**	**1890**	**0**	**93**	**230**	**72**	**64**	**2255**	**260**	**270**	**359**	**414**	**6219**

Peds	NORTH	WEST	SOUTH	EAST	
	Bexley Rd	*Shaw St*	*Bexley Rd*	*Slade Rd*	
Time Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
1600 - 1615	11	17	8	3	**39**
1615 - 1630	11	15	4	6	**36**
1630 - 1645	8	12	18	4	**42**
1645 - 1700	5	10	6	5	**26**
1700 - 1715	8	9	19	8	**44**
1715 - 1730	8	10	9	6	**33**
1730 - 1745	16	12	13	21	**62**
1745 - 1800	15	21	20	21	**77**
Period End	**82**	**106**	**97**	**74**	**359**

Combined	NORTH			WEST			SOUTH			EAST			
	Bexley Rd			*Shaw St*			*Bexley Rd*			*Slade Rd*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1600 - 1700	160	924	0	44	95	33	39	1141	121	131	165	203	**3056**
1615 - 1715	147	958	0	38	94	40	34	1071	117	143	188	199	**3029**
1630 - 1730	145	973	0	40	104	39	35	1083	117	141	198	216	**3091**
1645 - 1745	156	956	0	43	127	38	33	1120	133	135	202	225	**3168**
1700 - 1800	152	966	0	49	135	39	25	1114	139	139	194	211	**3163**
PEAK HOUR	**156**	**956**	**0**	**43**	**127**	**38**	**33**	**1120**	**133**	**135**	**202**	**225**	**3168**

Peds	NORTH	WEST	SOUTH	EAST	
	Bexley Rd	*Shaw St*	*Bexley Rd*	*Slade Rd*	
Peak Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
1600 - 1700	35	54	36	18	**143**
1615 - 1715	32	46	47	23	**148**
1630 - 1730	29	41	52	23	**145**
1645 - 1745	37	41	47	40	**165**
1700 - 1800	47	52	61	56	**216**
PEAK HR	**37**	**41**	**47**	**40**	**165**

GEOTECHNICAL INVESTIGATION REPORT

307 - 311 BEXLEY ROAD & 88 - 96
NEW ILLAWARRA ROAD, BEXLEY NORTH NSW

PREPARED FOR TONY SOUEID
REPORT ID: *E16016BN-R02F*

Date: 19th January 2017
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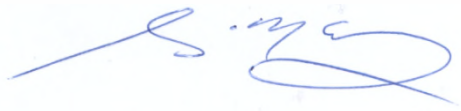

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1 PROJECT INFORMATION

1.1 INTRODUCTION

Geo-Environmental Engineering Pty Ltd (GEE) was commissioned by Tony Soueid to undertake a complete a geotechnical investigation at 307 - 311 Bexley Road & 88 - 96 New Illawarra Road, Bexley North, New South Wales (herein referred to as the 'site'). The site covers a combined area of approximately 4,200m^2 and comprises the following allotments:

- Lots 3, 4, 5 and 6 in Deposited Plan (DP) 508629,
- Lots A and B in DP 388204,
- Lot 1 in DP 1045200,
- Lot 1 in DP 400341, and
- Lot 35 in DP 663036.

A site survey plan is provided for reference in **Appendix A**, while a site location map is provided as **Figure 1**.

The investigation was required to support a planning proposal with Bayside Council which relates to the proposed rezoning of the land to 'R4 – High Density' residential with likely development to include a basement (single or multiple levels) and up to six levels above-ground, and was completed in conjunction with a preliminary contamination investigation, the results of which are reported separately.

1.2 PREVIOUS INVESTIGATIONS

In early 2016, STS GeoEnvironmental Pty Ltd (STS) completed a geotechnical investigation at the northern end of the site (reference 1). The geotechnical report included:

- The drilling of five boreholes (BH1 to BH5 – Refer **Figure 2**) across the northern part of the site (i.e. 307-309 Bexley Road) using a mechanical drilling rig equipped with solid flight augers,
- The performance of Dynamic Cone Penetrometer (DCP) tests at each borehole location to assess the consistency and/or relative density of the soil profile,
- Collection of samples from each of the borehole, and
- Analysis of selective samples for pH, sulphate and chloride content to provide a preliminary assessment of the aggressivity of the soil profile.

The subsurface conditions encountered by the STS boreholes comprised concrete and/or asphalt over fill material which was underlain by natural (i.e. previously undisturbed) sandy clays, clayey sands and weathered sandstone bedrock. The fill layer extended to a maximum depth of 1.6m, while the bedrock formation was encountered at depths of between 2.0m and 4.6m.

1.3 OBJECTIVES AND SCOPE OF WORKS

The objective of the investigation was to provide Council with sufficient information to be satisfied that the site is suitable for the proposed land-use and the likely development. A secondary objective was to provide geotechnical information to assist with the planning and preliminary design of the proposed development.

The scope of works completed by GEE, to achieve the above objectives, is provided below:

- A review of the previous investigation report,
- A review of the environmental and physical setting in which the site lies, including geology, hydrogeology and topography,
- Site inspection,
- Field investigations including:
  - The drilling of nine boreholes (BH101 to BH109) across accessible areas of the site, and
  - The installation of a groundwater monitoring well within three of the nine boreholes. These three wells compliment three existing wells at the northern end of the site within the existing Metro Petroleum Service Station. The origin of the existing wells is not known although they are believed to have been installed during the 2011 contamination assessment mentioned above. For the purpose of this assessment the former wells were labelled as Well GW01, GW02 and GW02 (**Figure 2**),
- Preparation of this report.

2 SITE INFORMATION

2.1 SITE IDENTIFICATION

A summary of the site location details is provided below, while a site location map is provided as **Figure 1**:

Street Address:	307 - 311 Bexley Road & 88 - 96 New Illawarra Road, Bexley North (**Figure 1**)
Legal Description:	Lots 3, 4, 5 and 6 in Deposited Plan 508629, Lots A and B in DP388204, Lot 1 in DP1045200, Lot 1 in DP 400341 and Lot 35 in DP663036.
Coordinates (MGA 56):	325760m E, 6242900m N
Local Government Area:	Bayside (formerly Rockdale)
Site Area:	Approximately 4,200m^2
Current Zoning:	Low Density Residential (R2)[1]
Current Use:	Mixture of low density residential and commercial/industrial (Metro Service Station)
Proposed Zoning:	High Density Residential (R4)
Proposed Use:	Commercial-residential mixed use

2.2 SITE DESCRIPTION

The site bounded by New Illawarra Road to the west, Bexley Road to the east a park/recreational space to the north and residential land to the south.

At the time of the field investigation, a Metro service station, with shop and mechanical workshop, occupied the northern end of the site (307-309 Bexley Road). The buildings in this part of the site were constructed of fibro and brick with a corrugated iron roof. Additionally, there was a metal awning extending from the eastern side of the shop over three fuel dispensers. A fourth fuel dispenser was located midway along the northern boundary. There were several underground fuel Storage Tanks (USTs) across the Metro Service station property (**Figure 3**) and the surface predominately comprised concrete or asphalt pavements with some garden beds along the perimeter of the property.

[1] Bayside (Rockdale) Local Environment Plan (LEP) 2011

Three groundwater monitoring wells were also observed across the Metro Service station forecourt and are likely from the former contamination assessment completed in 2011. As previously mentioned, GEE has not been provided with a copy of this report and for the purpose of this investigation they were labelled GW01 to GW03. Their approximate locations are shown on **Figure 2**.

The remainder of the site was occupied by residential dwellings, associated garages, sheds and swimming pools, although the dwelling at 94 New Illawarra Road was being used for commercial purposes (specifically an office for the Mental Health Recovery Institute.

2.3 TOPOGRAPHY

During the site investigation, it was noted that the site was situated on a slope, highest in elevation at the southern end of the site, dipping down towards the north and north-east at approximately 5% to 10%.

2.4 GEOLOGY AND SOILS

2.4.1 *Regional*

A review of the Sydney 1:100,000 regional geological map (reference 2) indicates that the site is situated on the geological contact between the Ashfield Shale and Hawkesbury Sandstone formations. The Ashfield Shale formation comprises "*…black to dark-grey shale and laminite"* whilst the Hawkesbury Sandstone typically consists "*...medium to coarse-grained quartz sandstone, very minor shale and laminite lenses".*

A review of the regional soils map (reference 3) indicates the site is located within the Gymea Soil Landscape Group, recognised by undulating to rolling rises and low hills on Hawkesbury Sandstone. Local reliefs are between 20-80m while slopes are typically between 10-25% in gradient. Soils of the Gymea Group are typically erosional sands and clays, have very low soil fertility and form a high soil erosion hazard.

2.4.2 *Local*

The subsurface conditions encountered by the STS boreholes (reference 1) comprised concrete and/or asphalt over fill material which was underlain by natural (i.e. previously undisturbed) sandy clays, clayey sands and weathered sandstone bedrock. The fill layer extended to a maximum depth of 1.6m, while the bedrock formation was encountered at depths of between 2.0m and 4.6m.

2.5 HYDROGEOLOGY

Permanent groundwater is likely to be confined or partly confined within discrete, water-bearing zones within the bedrock formation. However, intermittent 'perched' water seepage is likely to occur at the soil-bedrock interface following heavy and prolonged rainfall events.

Groundwater flow is dominated by water movement through fractures or joints, where stress has caused partial loss of cohesion in the rock, with evidence of potential water bearing fractures usually the presence of clay or iron-staining along the face of joints.

2.6 ACID SULFATE SOIL POTENTIAL

Acid Sulfate Soil is naturally occurring sediments and soils containing iron sulfides (principally iron sulfide, iron disulfide or their precursors). Oxidation of these soils through exposure to the atmosphere or through lowering of groundwater levels results in the generation of sulfuric acid.

Land that may contain potential acid sulfate soils was mapped by the NSW Department of Land and Water Conservation (DLWC) and based on these maps local Councils produced their own acid sulfate soil maps to be used for planning purposes.

The Acid Sulfate Soils Map produced by the NSW Department of Planning and Environment, via interactive online mapping, indicates that the site lies within area defined as "*Class 5*". In accordance with Clause 6.1 of Council's Local Environment Plan (LEP) 2011, a preliminary assessment of acid sulfate soil and potentially a management plan is recommended for any "*Works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum by which the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land*".

Firstly, the surface elevation is greater than 5m AHD (approximately between 10-20m AHD). Secondly, the maximum depth of proposed excavation is expected to be 7m below the ground surface (bgs) which equates to a bulk excavation level which is significantly greater 1m AHD. Additionally, there is no need for de-watering which would reduce the water table in adjoining Class 1 to Class 4 land below 1m AHD, which according to the acid sulphate maps produced by Council, is approximately 250m west of the site. In this regard, there is no need for an acid sulphate soil assessment or management plan

3 FIELD INVESTIGATIONS

Fieldwork was undertaken by Stephen McCormack, an experienced geotechnical engineer from GEE, on the 1st of November 2016 and comprised

- ◊ The drilling of nine boreholes (BH101 to BH109) in accessible areas across the site, and
- ◊ The installation of a groundwater monitoring well within three of the nine boreholes.

3.1.1 *Borehole Drilling Operations and Logging*

Prior to commencement of the bores, a scan for potential underground services and utilities was completed and cross-checked with the results of a Dial Before you Dig (DBYD) search.

The boreholes were drilled using either an 85mm diameter stainless steel hand auger operated by Stephen McCormack from GEE, or with a mechanical Hanjin D&B track rig that was owned and operated by Total Drilling Pty Ltd and equipped with Solid Flight Augers (SFA) and a tungsten-carbide drill bit (TC-bit). The hand auger was used in areas where the mechanical rig could not access which were boreholes BH108 and BH109.

With the exception of borehole BH104, the boreholes were extended through any fill material into the natural soil profile before terminating on, or within, the underlying sandstone bedrock formation at depths of between 0.75m and 3.8m below ground surface (bgs). Borehole BH104 refused on an obstruction within the fill profile (likely concrete) at a depth of 1.2m bgs.

During drilling, the encountered fill and natural soils were geologically logged by an experienced environmental and geotechnical engineer taking care to describe the presence and depth of fill material / previously disturbed ground, the natural stratum, moisture, seeps or water baring zones, elevation of the water level/hydraulic head, and adverse aesthetics such as discolouration, odours or obvious evidence of contamination.

A summary of the subsurface conditions encountered is provided in Section 3.2, while a summary of the borehole information, including total depth, is provided in **Table 1** and their locations are shown on **Figure 2**. Also included in Table 2 and Figure 2 are details and location of the geotechnical bores completed by STS (reference 1). The borehole logs (including the previous STS bores) are provided in **Appendix B**.

Table 1: Summary of the Borehole Information

Borehole ID	Date Completed	Drilling Method	Total Depth	Depth of Filling [1]	Depth to Bedrock	Well Screen Interval
			(m BGS)	(m BGS)	(m BGS)	(m BGS)
GEE Boreholes 2016						
BH101	1 Nov 2016	Mechanical	3.8	2.7	2.7	--
BH102	1 Nov 2016	Mechanical	2.4	2.0	2.0	1.0 – 2.2
BH103	1 Nov 2016	Mechanical	1.4	1.1	1.1	--
BH104	1 Nov 2016	Mechanical	1.2	>1.2	--	--
BH105	1 Nov 2016	Mechanical	2.4	1.05	2.3	1.15 – 2.35
BH106	1 Nov 2016	Mechanical	2.2	0.6	1.9	--
BH107	1 Nov 2016	Mechanical	2.8	0.7	1.4	1.6 – 2.8
BH108	1 Nov 2016	Hand Auger	0.75	0.3	0.75	--
BH109	1 Nov 2016	Hand Auger	1.35	0.7	1.35	--
STS Boreholes 2015						
BH1	14 Dec 2015	Mechanical	3.2	0.2	3.0	--
BH2	14 Dec 2015	Mechanical	0.6	>0.6	--	--
BH3	14 Dec 2015	Mechanical	5.0	1.6	4.6	--
BH4	14 Dec 2015	Mechanical	2.2	0.6	2.0	--
BH5	14 Dec 2015	Mechanical	0.8	>0.8	--	--

m BGS = metres below ground surface
Note 1: Depth of fill included topsoil, concrete and any soil which had been previously disturbed.

3.1.2 *Monitoring Well Installation*

Groundwater monitoring wells were installed in boreholes BH01, BH02 and BH03 in general accordance with the Land and Water Biodiversity Committee (2012) *Minimum Construction Requirements for Water Bores in Australia* (reference 4), using 50 mm diameter uPVC pipe, with a machine slotted screen section, 2 mm sand pack and a bentonite seal. The depths of the screened section of the wells is provided in **Table 1**.

The purpose of the groundwater monitoring wells was to assess the presence and depth of stabilised groundwater at the site and facilitate the sampling of groundwater beneath the site as part of the separate site contamination assessment.

The groundwater well installation details are shown on the borehole logs in **Appendix B.**

3.2 SUBSURFACE CONDITIONS

The site stratigraphy, as observed in the boreholes (both GEE and STS) typically comprised pavements and/or topsoil over fill material overlying natural clay soils, which in turn was underlain by weathered sandstone bedrock. The depth of filling at the borehole locations was between approximately 0.2m and 2.7m bgs, while the depth to bedrock encountered by the boreholes was between 0.75m and 4.6m bgs.

Detailed descriptions of the subsurface conditions on site are provided in the borehole logs provided in **Appendix B**, while the soil profile is also summarised in **Table 2**.

Table 2: Summary of Subsurface Conditions

Layer / Unit	Description	Depth to Base of Layer (m)[1]	Consistency / Relative Density and estimated Strength[1]
FILL	CONCRETE and/or Asphalt Mix of sand, gravel, silt and clay.	0.2 – 2.7	-- Variable
NATURAL SOIL	Clayey SAND / Sandy CLAY: light grey, orange-brown, red-brown, medium to coarse grained sand, low plasticity clay, moist	0.75 – 2.3	Stiff to very stiff
BEDROCK	SANDSTONE: grey and orange-brown, medium to coarse grained	>5.0	--

Note 1: Estimated from SPT tests and borehole observations

Adverse aesthetics, specifically odours associated with potential contamination, were not noted during the fieldwork. Additionally, no potentially Asbestos Containing Materials (ACM) was observed in the bores during the drilling.

3.2.1 *Groundwater*

The majority of boreholes drilled by GEE were dry during drilling and also upon completion. Exceptions included some seepage water encountered below 1.6m in borehole BH102 and slight seepage noted between a depth of 2.0m and 2.8m depth within borehole BH107.

The stabilised level of groundwater within the wells installed within BH102, BH107, GW01, GW02 and GW03 was measured on the 14th November 2016 (approximately 13 days after installation of the wells) at depths of 1.28m, 1.78m, 2.21m, 2.13m and 1.34m bgs respectively. As previously mentioned, the well within borehole BH105 was dry to a depth of 2.4m bgs.

The water encountered in the wells is considered to be perched water flowing along the soil/bedrock interface and such water is normally significantly influenced by rainfall events and therefore its presence can be intermittent. This is supported by the fact that the well installed within borehole BH105 was dry to a depth of 2.4m.

Taking into account the approximate surface elevation at each of the well locations, it is inferred that the perched water is following the regional topography and flowing in a northerly to north-easterly direction. Although the flow direction is expected to have been significantly altered by the presence of UST tankpit excavations in the northern end of the site.

4 DISCUSSION

4.1 SITE PREPARATION

Following demolition of the existing structures, and prior to bulk excavation works and construction of any new development, all topsoil with organic matter and any pavement materials, should be removed from the proposed building and pavement areas. Stripped topsoil should be stockpiled for re-use as landscape material, or disposed off-site.

Material removed from site will need to be managed in accordance with the provisions of current legislation and may include segregation by material type classification in accordance with NSW EPA (2014) *Waste Classification Guidelines* (reference 12) and disposal at facilities appropriately licensed to receive the particular materials. GEE notes that the natural undisturbed clay soil and rock may be classified as Virgin Excavated Natural Material (VENM) and re-used on other sites rather than disposed at a landfill. However, the material will require sampling and analysis for a broad suite of potential contaminants to ensure it is free of contamination.

4.2 EARTHWORKS

Based on the preliminary development options, earthworks are likely to comprise excavation of between approximately 3m to 7m to facilitate the construction of a one or two level basement. Locally deeper excavations are also likely for service trenches and lift shafts. For the purpose of this report, it is assumed that the excavation will extend to within close proximity to the property boundaries.

4.2.1 *Excavation*

Based on the fieldwork undertaken as part of this investigation, the excavation will encounter surface fill material and natural sandy clay/clayey sand soil, before encountering weathered sandstone below depths of between 0.75m to 4.60m depth. GEE notes that the strength of the bedrock has not been assessed as part of this geotechnical investigation, however, based on local knowledge it is likely to be initially extremely low to very low strength, becoming at least low to medium strength with depth of the basement. To confirm the strength of the bedrock within the depth of proposed excavation would require more detailed investigations (preferably following demolition of the existing dwelling) including the coring and strength testing of the bedrock formation.

The fill and natural soil profile is expected to be readily excavated using standard equipment such as excavators. However, the use of an impact hammer and/or rock saw will be required upon encountering the bedrock formation, especially when combined with unfavourable rock-defect geometry. When using an impact hammer the effects of vibration should be considered and are discussed further in Section 4.2.4.

4.2.2 *Groundwater Inflow*

Groundwater or seepages were encountered at the soil bedrock interface during this investigation and additional seepages should also be expected to occur over time through defects in underlying bedrock formation. The seepage is expected to be intermittent and recharged by rainfall events, and is expected to be sufficiently managed during the earthworks phase by pumping from a sump at the base of the excavation. In the long term, conventional techniques such as strip drains behind basement walls and ag-lines will need to be incorporated into the design of the basement, along with a sump and pump system linked to the regional stormwater system. Alternatively the basement walls will need to be waterproofed.

4.2.3 *Excavation Support*

Considering that the excavation is expected to extend to within close proximity of the site boundaries, temporary shoring, or the early construction of permanent walls designed to shore up the boundaries, will be required.

At this preliminary stage the options for shoring include the use of evenly spaced mass concrete piles, secant piles, soldier piles or contiguous piling. Also, it will be important to protect any soil that is exposed at the boundary during excavation works, to prevent the soil from drying out, shrinking and potentially impacting on shallow footings of any adjoining structures.

The choice of retention system / earth support should be discussed with an experienced and specialist contractor for wall construction and anchor installation, and will primarily depend on cost. However, other factors such as the need for a watertight seal, the appearance of the final wall and whether it can be utilised as structural support as part of the final development, will need to be considered.

The design of the shoring may be undertaken in accordance with AS 4678-2002 *Earth Retaining Structures* (reference 5) and should consider the short and long term configurations. In the short term, should the shoring walls be cantilevered or supported by a single row of anchors and some wall movements can be tolerated (flexible wall),

the pressure acting on the wall can be estimated on the basis of a triangular earth pressure distribution.

When internal props, such as the ground floor slab, restrain retaining wall movement, or where significant movements cannot be tolerated (rigid wall) such as along the eastern boundary, an 'at-rest' earth pressure coefficient (Ko) should be adopted with either a uniform or trapezoidal pressure distribution. It should be noted that shoring which is designed for this 'at rest' coefficient will still undergo some lateral movements, depending on the final configuration of the wall and construction sequence.

The design of any retaining structures should make allowance for all applicable surcharge loadings including construction activities around the perimeter of the excavation and adjacent buildings. Consideration should be given to the possibility of a hydrostatic pressure due to build-up of water behind the wall (*e.g.* from broken services), unless permanent subsurface drainage can be provided.

Toe restraint may be achieved by embedding the retention system below the base of the excavation. If a suitable socket cannot be achieved rock anchors will need to be installed in the toe to provide lateral restraint. Internal props, or anchors, are also likely to be required to restrain the upper sections of the deeper excavations. If anchors are adopted, and they extend beyond the boundary, permission from the neighbours will be required.

Finally, computer aided analysis may be carried out to assess potential ground movements based on different wall designs and construction sequence, so as to control deflections to within tolerable limits. It is also considered prudent to carry out surveys before and after installation to measure the actual movement of the wall or soil.

Geotechnical parameters for the soil and bedrock profile encountered at the site are provided in **Table 3** below.

Table 3: Geotechnical Design Parameters – Retaining Walls

Units	Depth to Top of Layer (m)	Unit Weight (kN/m³)	Active Lateral Earth Pressure (Ka)		Lateral Earth Pressure at Rest (Ko)	Passive Lateral Earth Pressure (Kp)
			Short-Term	Long-Term		
Soil Profile and EL strength Sandstone	Surface	19	0.35	0.4	0.50	--
Sandstone: VL strength (or better)	~1.0 – 4.6	21	0.25	0.30	0.40	3.5

4.2.4 *Construction / Excavation Induced Vibration*

When using a hydraulic hammer, vibrations will be transmitted through the ground and potentially impact on adjoining structures including the buried services. Where possibly the use of other techniques not involving impact (*e.g.* rock saws), should be adopted as they would reduce or possibly eliminate risks of damage due to vibrations.

The structures on the adjacent properties are sensitive to vibrations above certain threshold levels (regarding potential for cracking). Given that the proposed basement excavation will extend to within close proximity of the boundaries, close controls by the excavation contractor over the rock excavation are necessary, and are recommended, so that excessive vibration effects are not generated.

Peak Particle Velocity (PPV) is usually the adopted measure of ground vibration and the safe limits depend on the sensitivity of the adjoining structures and services. There is a number of Australian and overseas publications which provide vibration velocity guideline levels (or safe limits) including:

- ◊ Australian Standard AS2187.2-2006 Explosives - Storage and use - Use of explosives - Appendix J: Ground Vibrations and Airblast Overpressure (reference 6).
- ◊ Australian Standard AS2670.2-1990 Evaluation of human exposure to whole-body vibration - Part 2: Continuous and shock-induced vibration in buildings (1 to 80 Hz) (reference 7).
- ◊ DIN 4150 – Part 3 – 1999. Effects if Vibration on Structures (reference 8).
- ◊ Department of Environment and Conservation NSW, 2006. Assessing Vibration: a technical guideline (reference 9).

- ◊ British Standard BS 7385-1:1990. Evaluation and measurement for vibration in buildings. Guide for measurement of vibrations and evaluation of their effects on buildings (reference 10).
- ◊ British Standard BS 7385-2:1993. Evaluation and measurement for vibration in buildings. Guide to damage levels from ground-borne vibration (reference 11).

The most appropriate guidelines levels for the proposed excavation work are provided in AS2187.2-2006, which refers to guideline values from BS7385-2 for the prevention of minor or cosmetic damage occurring in structures from ground vibration. Additionally, the guideline levels provided in DIN 4150 Part 3 is considered an appropriate source for guideline levels.

Ideally, safe limits should be determined by a specialist vibration consultant, with consultation with Sydney Water also recommended. However, as a preliminary and conservative guide, and considering the above guidelines and the type of nearby structures (including Sydney Water assets), GEE recommend that excavation methods should be adopted which limit ground vibrations at the adjoining developments to not more than 5mm/sec, and vibration monitoring will be required to verify that this is achieved.

As a guide, the PPV limits of 5mm/sec are expected to be achievable if rock breaker equipment or other excavation methods are restricted as indicated in **Table 4**.

Table 4: Recommendations for Rock Hammer Equipment

Distance from adjoining structure (m)	**Maximum Peak Particle Velocity 5mm/sec**	
	Equipment	**Operating Limit (% of Maximum Capacity)**
1.0 to 2.0	Hand operated jackhammer only	100
2.0 to 5.0	300 kg rock hammer	50
5.0 to 10.0	300 kg rock hammer or 600 kg rock hammer	100 50

GEE notes human discomfort levels caused by vibration are typically less than the levels that are likely to cause cosmetic or structural damage to structures. Therefore, complaints may be lodged by neighbours before any cosmetic or structural damage

occurs. In this regard, consideration may be given to adopting more stringent vibration limits recommended for human amenity or, as a minimum, ensuring that vibration monitoring is undertaken as reassurance to confirm that vibrations are within safe limits. Acceptable vibration limits for human comfort caused by construction and excavation equipment are provided in DEC (2006) (reference 9). Specifically maximum acceleration limits as specified in Table 2.2 of the guideline should be adopted.

Finally, at all times, the excavation equipment should be operated by experienced personnel, according to the manufactures instructions, and in a manner consistent with minimising vibration effects. Measures which may be used to minimise vibration include:

- ◊ Progressive breakage from open excavated faces,
- ◊ Selective breakage along open joints, where present,
- ◊ Use of rock hammers in short bursts to prevent generation of resonant frequencies,
- ◊ Orientation of the rock hammer pick away from property boundaries and into the existing open excavation,
- ◊ Commencement of excavation as far away from other structures as possible, and
- ◊ The use of a rock sawing or grinder adjacent to the site boundaries. GEE notes that this equipment also reduces the possibility of overbreak and loosening of the rock mass.

4.3 FOUNDATIONS

GEE recommends that footings for the proposed development be founded on a consistent medium to minimise any potential for differential settlements. Following excavation of the basement level, the subgrade (or bulk excavation level) will likely comprise weathered sandstone bedrock, regardless of there being a single or double basement.

The sandstone formation is considered to be a suitable founding medium for the proposed development, however, further investigations are recommended to minimise uncertainty about the depth, strength and quality of the sandstone formation beneath the site and this should include coring and logging of the bedrock, followed by strength testing of recovered rock cores.

The serviceability end bearing pressures, ultimate end bearing pressures and ultimate shaft adhesion, for the various classes of Hawkesbury sandstone, are provided for reference in **Table 5** and is based on the recommendations of Pells et al (reference 13).

Table 5: Preliminary Foundation Design Parameters

Founding Stratum	Ultimate End Bearing Pressure (kPa)	Serviceability End Bearing Pressure (kPa)	Ultimate Shaft Adhesion (kPa)
Sandstone Class V	3000	1000	150
Sandstone Class IV	4000	1000	250
Sandstone Class III	20,000	3500	800
Sandstone Class II	60,000	6000	1500

The above design parameters assume that the piles are socketed at least 0.3m into the desired sandstone class. Additionally, settlements for footings on rock are anticipated to be less than about 1% of the pile diameter.

Finally, footing systems should be designed by a suitably qualified and experienced structural engineer and GEE recommends that inspection by a geotechnical engineer is undertaken during the pier construction stage, to confirm that the design founding conditions have been achieved.

4.4 EARTHQUAKE DESIGN

Structural design for earthquake loads should be carried out in accordance with the relevant provisions in AS1170.4–2007 (reference 14). Based on the encountered subsurface soil profile and expected regional geology, and with reference to Table 4.1 of AS1170.4, the site sub-soil class is considered to be C_e.

5 CONCLUSION AND RECOMMENDATIONS

GEE considers that sufficient information has been gained to be confident of the subsurface conditions across the site, to assist with the planning and preliminary design of the proposed development and to provide Council with assurances regarding the geotechnical feasibility of the proposed development.

Based on the results of the investigation, the planning proposal is considered to be feasible. Additionally, GEE concludes that the existing sandstone rock formation is capable of withstanding the proposed loads to be imposed, and standard shoring works (provided they are designed by a structural engineer), will ensure the stability of the excavation and provide protection and support of adjoining properties and other infrastructure (e.g. buried services).

The geotechnical issues associated with the proposed development have been addressed by the investigation and are discussed in this report. However, further investigation should be undertaken (once the plans for the proposed development have been finalised and preferably post demolition) to more accurately define the strength and quality of the bedrock and minimise the uncertainty for earthworks contractors and structural design engineers when planning and designing the proposed excavation and foundations.

GEE will be pleased to assist with any further advice or geotechnical services required in regard to the proposed development.

6 GENERAL LIMITATIONS

Soil and rock formations are variable. The logs or other information presented as part of this report indicate the approximate subsurface conditions only at the specific test locations. Boundaries between zones on the logs or stratigraphic sections are often not distinct, but rather are transitional and have been interpreted.

The precision with which subsurface conditions are indicated depends largely on the frequency and method of sampling, and on the uniformity of subsurface conditions. The spacing of test sites also usually reflects budget and schedule constraints. Groundwater conditions described in this report refer only to those observed at the place and under circumstances noted in the report. The conditions may vary seasonally or as a consequence of construction activities on the site or adjacent sites.

Where ground conditions encountered at the site differ significantly from those anticipated in the report, either due to natural variability of subsurface conditions or construction activities, it is a condition of this report that GEE be notified of any variations and be provided with an opportunity to review the recommendations of this report. Recognition of changed soil and rock conditions requires experience and it is recommended that a suitably experienced geotechnical engineer be engaged to visit the site with sufficient frequency to detect if conditions have changed significantly.

The comments given in this report are intended only for the guidance of the design engineer, or for other purposes specifically noted in the report. The number of boreholes or test excavations necessary to determine all relevant underground conditions which may affect construction costs, techniques and equipment choice, scheduling, and sequence of operations would normally be greater than has been carried out for design purposes. Contractors should therefore rely on their own additional investigations, as well as their own interpretations of the borehole data in this report, as to how subsurface conditions may affect their work.

7 REFERENCES

1. STS GeoEnvironmental Pty Ltd, 2016: *Preliminary Geotechnical Investigation for Tony Soueid, Bexley Road, Bexley North New South Wales.* Report No. 15/3507A Project No. 20749/6466C, Dated February 2016.
2. Department of Mineral Resources, 1983: Sydney 1:100,000 *Geological Series Map Sheet 9130 (Edition 1).*
3. Department of Environment, Climate Change and Water, 2009: *Sydney 1:100 000 Soil Landscape Series Sheet 9130 (fourth edition).*
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5. Australian Standard AS4678-2002: Australian Standard, 2002: *Earth Retaining Structures*.
6. Australian Standard AS2187.2-2006 *Explosives - Storage and use - Use of explosives* - Appendix J: *Ground Vibrations and Airblast Overpressure.*
7. Australian Standard AS2670.2-1990: *Evaluation of human exposure to whole-body vibration - Part 2: Continuous and shock-induced vibration in buildings (1 to 80 Hz)*.
8. DIN 4150 – Part 3 – 1999. *Effects if Vibration on Structures.*
9. Department of Environment and Conservation NSW, 2006. *Assessing Vibration: a technical guideline.*
10. British Standard BS 7385-1:1990. *Evaluation and measurement for vibration in buildings. Guide for measurement of vibrations and evaluation of their effects on buildings.*
11. British Standard BS 7385-2:1993. *Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration.*
12. New South Wales Environment Protection Authority (NSW EPA), 2014:Waste classification guidelines – Part 1 classifying waste. November 2014
13. Pells et al, 1998: *Foundations on Sandstone and Shale in the Sydney Region*, Australian Geomechanics Society, 1998.
14. AS 1170.4-2007. *Structural design actions Part 4: Earthquake actions in Australia*.

FIGURES

1 – Site Location Map
2 – Site Plan
3 – UST Locations

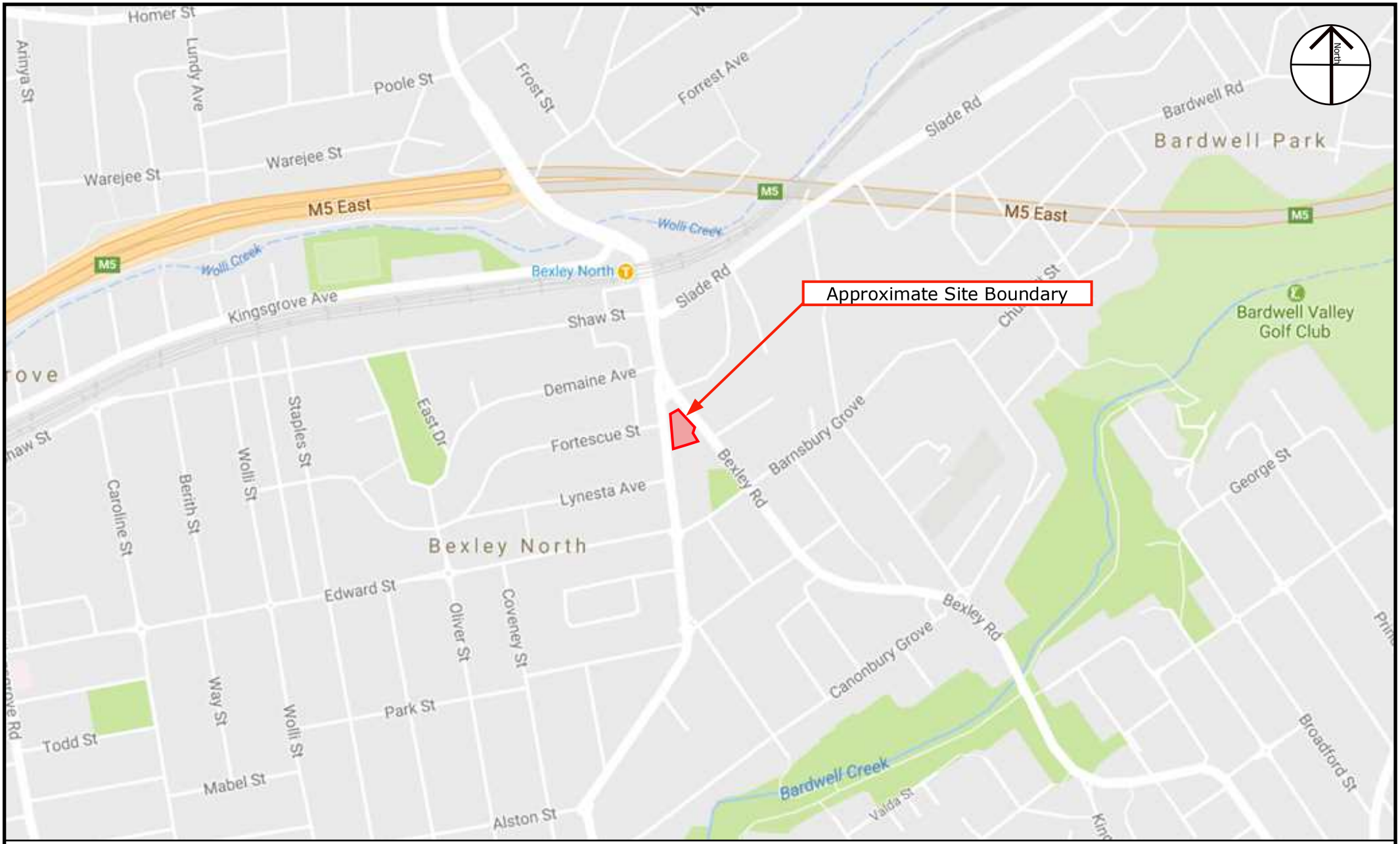

Image Source: ©2016 Google - Google Maps, retrieved 05/08/2016

geo-environmental ENGINEERING
82 BRIDGE STREET
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P - 61 (2) 9420 3361
E - info@geoenvironmental.com.au
www.geoenvironmental.com.au

TITLE: SITE LOCATION MAP: 307-311 Bexley Rd & 88-96 New Illawarra Rd, Bexley North NSW	SCALE: **N.T.S**	DATE: **8 Nov 2016**	FIGURE No. **1**
	DRAWN: **A. Chiem**	JOB No.: **E16016BN**	REVISION: **A**

Aerial image: provided by SIXmaps (NSW LPI) - retrived 03/11/2016

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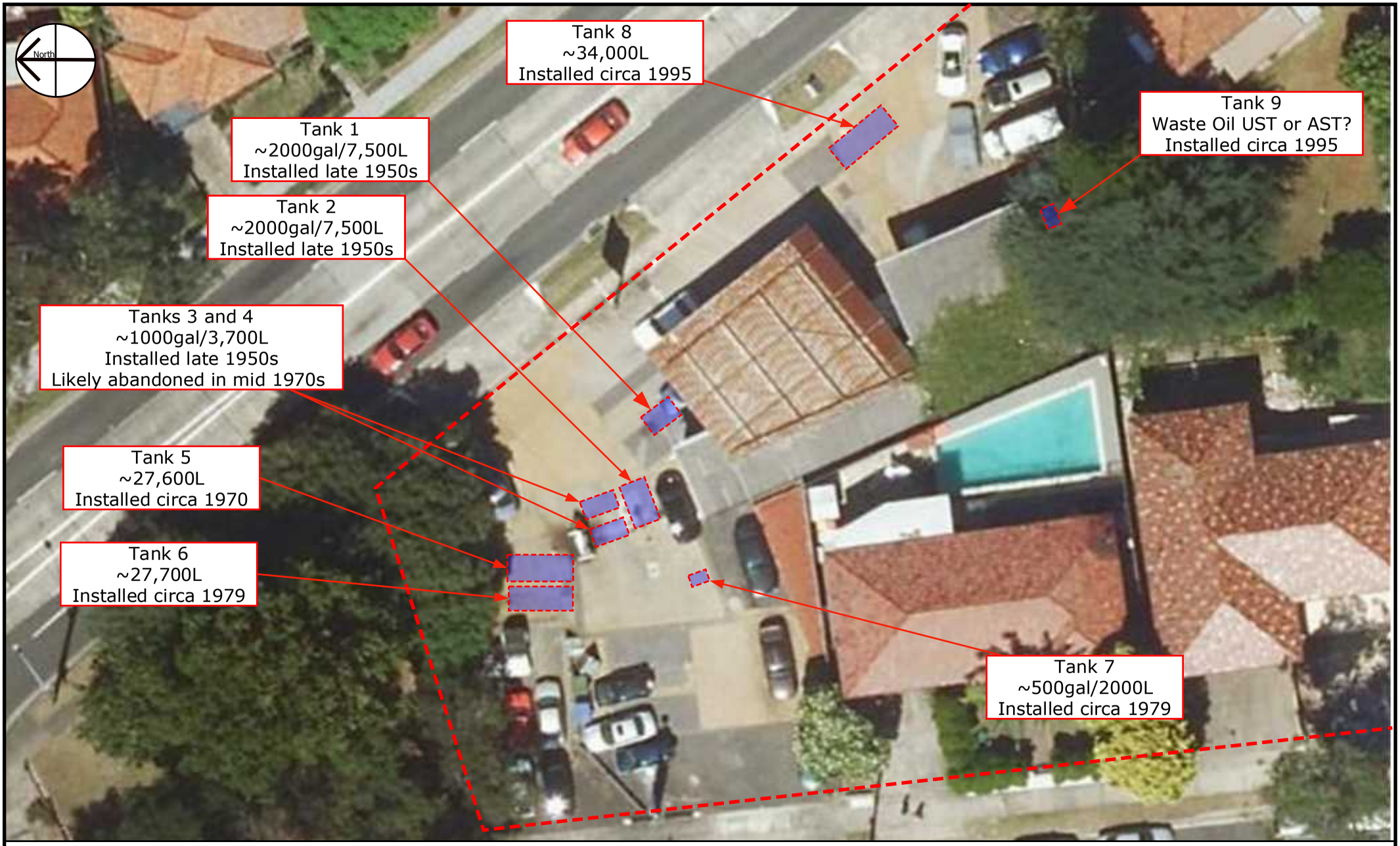
E - info@geoenvironmental.com.au
www.geoenvironmental.com.au

TITLE: SITE PLAN 307-311 Bexley Rd & 88-96 New Illawarra Rd Bexley North NSW	SCALE: **N.T.S**	DATE: **10 Dec 2016**	FIGURE No. **2**
	DRAWN: **A. Chiem**	JOB No.: **E16016BN**	REVISION: **A**



Aerial image: provided by SIXmaps (NSW LPI) - retrived 03/11/2016

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82 BRIDGE STREET
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www.geoenvironmental.com.au

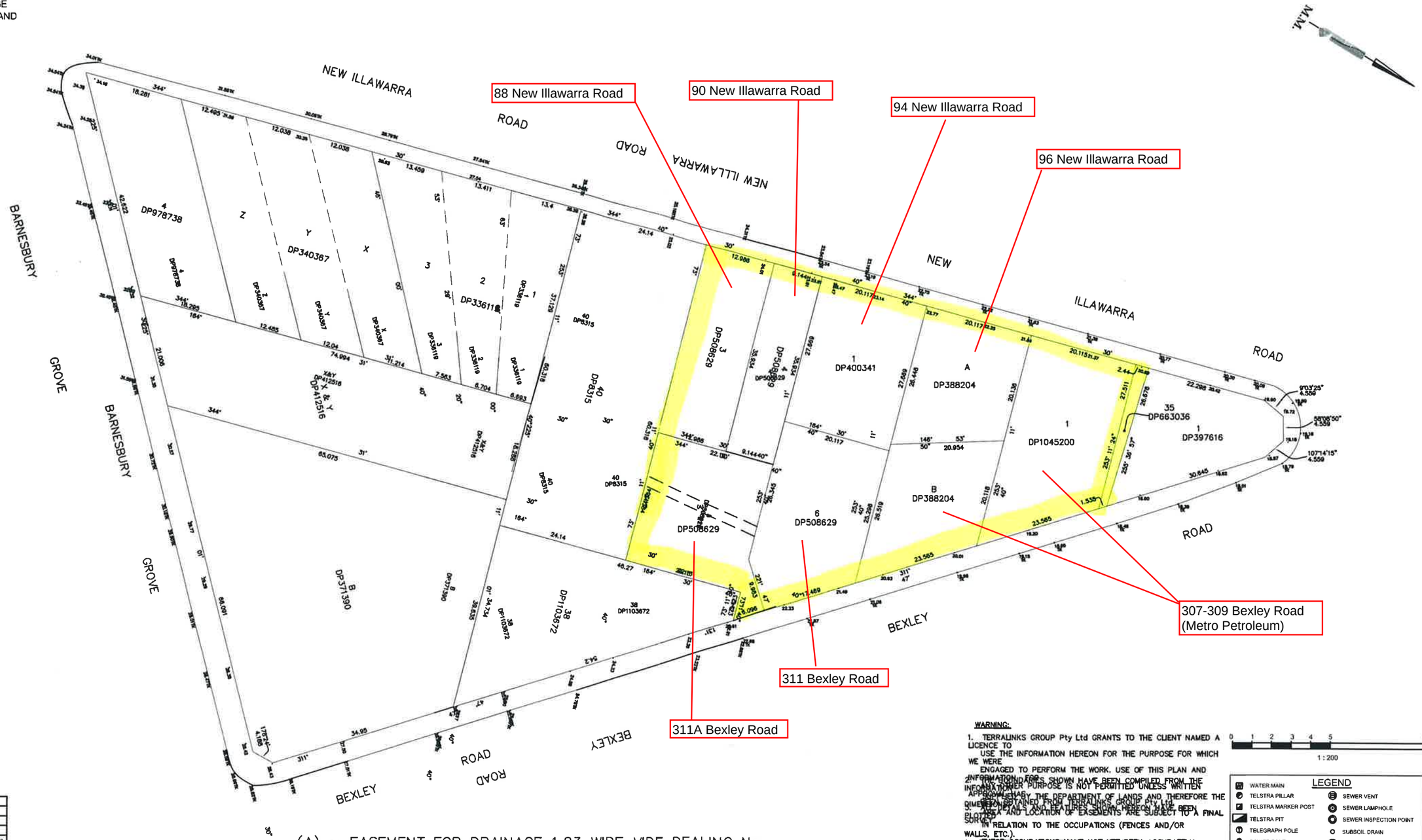
TITLE:	SCALE:	DATE:	FIGURE No.
UST Locations	N.T.S	21 Dec 2016	3
	DRAWN: A. Chiem	JOB No.: E16016BN	REVISION: A

APPENDIX A

SITE SURVEY

A1

L.G.A. : ROCKDALE
PARISH : ST GEORGE
COUNTY : CUMBERLAND



(A) ~ EASEMENT FOR DRAINAGE 1.83 WIDE VIDE DEALING No. J601625 AND J601626.

Rev.	Amendments	Date

PLAN SHOWING THE BOUNDARIES AND KERB LEVELS FOR No. 307–311A BEXLEY ROAD & No. 94–100 ILLAWARRA ROAD, BEXLEY NORTH FOR REZONING PURPOSES AND TO SUPPORT A D.A.

TERRALINKS
ABN 52 159 137 907
UNIT 16/429 THE BOULEVARDE, KIRRAWEE NSW 2232
c/– PO Box 559, SUTHERLAND NSW 1499
PH 1300 525 584 FAX (02) 9521 6315 MOB 0418 417 341
Email: mail@terralinks.com.au

JOB No.	YOUR REF:
4912	SOUED
DRAWING No.	CLIENT:
4912CO.dwg	JS ARCHITECTS PTY LTD

SCALE: 1:200 (A1)	SURVEYED	DRAWN	CHECKED
DATUM: AHD	M.M.	M.M.	J.P.
SHEET: 1 OF 4	DATE: 16.05.19	DATE: 19.05.19	DATE: 19.05.19

JACE THOMAS PEARSON
SURVEYOR REGISTERED
UNDER SURVEYING & SPATIAL
INFORMATION ACT, 2002
IDENTIFICATION No. 1827

TOTAL AREA OF SITE

VIDE DP's:	3,774.9m²
BY CALC :	3,870.9m²

ORIGIN OF LEVELS :
SSM 112399 RL=22.32 (AHD) FOUND NEAR THE INTERSECTION OF NEW ILLAWARRA ROAD & FORTESCUE STREET.
ACCURACY OF ORIGIN : ± 0.01m

DIAL 1100 BEFORE YOU DIG
www.1100.com.au

WARNING:

1. TERRALINKS GROUP Pty Ltd GRANTS TO THE CLIENT NAMED A LICENCE TO USE THE INFORMATION HEREON FOR THE PURPOSE FOR WHICH WE WERE ENGAGED TO PERFORM THE WORK. USE OF THIS PLAN AND INFORMATION FOR ANY OTHER PURPOSE IS NOT PERMITTED UNLESS WRITTEN APPROVAL IS OBTAINED FROM TERRALINKS GROUP PTY LTD.
2. THE POWER AND TELEPHONE SERVICES SHOWN HEREON HAVE BEEN PLOTTED FROM INFORMATION SUPPLIED BY THE DEPARTMENT OF LANDS AND THEREFORE THE ACCURACY AND LOCATION OF EASEMENTS ARE SUBJECT TO A FINAL SURVEY.
3. NO INVESTIGATION WAS MADE IN RELATION TO THE OCCUPATIONS (FENCES AND/OR WALLS, ETC.).
4. THESE DOCUMENTS ARE NOT TO BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH THEY WERE COMMISSIONED AND NO RESPONSIBILITY IS ACCEPTED FOR USE OUTSIDE OF THAT PURPOSE OR BY ANY PERSON OTHER THAN THE PERSON FOR WHOM THEY WERE PREPARED.
5. SERVICES SHOWN HEREON ARE THOSE THAT WERE VISIBLE AT THE TIME OF SURVEY AND HAVE BEEN LOCATED BY FIELD SURVEY.
FURTHER SERVICES MAY BE PRESENT. PRIOR TO ANY CONSTRUCTION OR EXCAVATION ON SITE, THE RELEVANT AUTHORITIES SHOULD BE CONTACTED.
6. CONTOUR INTERVAL IS 0.2 m.
7. DUE TO SCALE, LOCATION DATA IS NOT SUITABLE FOR SETTING OUT CONSTRUCTION.
8. THE CONTOURS HAVE BEEN DERIVED FROM INTERPOLATION METHODS USING COMPUTER SOFTWARE PROGRAM AND WHEREVER POSSIBLE SPOT LEVELS SHOULD BE USED IN PREFERENCE TO CONTOURS.
9. THE RIDGE HEIGHTS, ROOF LINE, GUTTER AND WINDOW SILL LEVELS FOR BOTH THE SUBJECT AND ADJOINING BUILDINGS HAVE BEEN DETERMINED USING INDIRECT SURVEY METHODS AND ARE THEREFORE APPROXIMATE ONLY.
10. THE MEASUREMENT OF ALL TREE TRUNK DIAMETERS WAS IN ACCORDANCE WITH AS4970-2009 PROTECTION OF TREES ON DEVELOPMENT SITES.
11. THESE NOTES ARE AN INTEGRAL PART OF THIS PLAN.

0 1 2 3 4 5 10m
1 : 200

LEGEND

WATER MAIN	SEWER VENT
TELSTRA PILLAR	SEWER LAMPHOLE
TELSTRA MARKER POST	SEWER INSPECTION POINT
TELSTRA PIT	SUBSOIL DRAIN
TELEGRAPH POLE	STORMWATER PIT
POWER POLE	STORMWATER GRATE
ELECTRICAL PILLAR	SURFACE INLET PIT
POWER LIGHT POLE	LINTEL-KERB INLET PIT
LIGHT POLE	LINTEL-KERB INLET PIT WITH GRATE
HYDRANT	STORMWATER PIPE INCLUDING PIPE SIZE (Ø 0.225)
RECYCLED WATER	HEADWALL
WATER METER	CLOTHES LINE
STOP VALVE	TREE: Ø DIAMETER S SPREAD
WATER TAP	OVERHEAD ELECTRICITY LINE
GAS METER	OVERHEAD TELECOM LINE
GAS DIRECTION MARKER	SEWER LINE
GAS INSPECTION POINT	
SEWER MANHOLE	
STREET SIGN	
PRAM CROSSING	
VEHICLE CROSSING	

APPENDIX B

BOREHOLE LOGS

Borehole Log Report

Geo Environmental Engineering
82 Bridge St
Lane Cove NSW 2066
T 02 9420 3361

geo-environmental ENGINEERING

Hole ID. **BH101**
Hole Depth: **3.80 m**
Sheet: **1 of 1**

Project Name: **Geotechnical and Contamination Assessment**
Project Number: **E16016BN**
Location / Site: **307-311 Bexley Rd & 88-96 New Illawarra Rd, Bexley North NSW**
Client: **Tony Soueid**

Drilling Company: **Total Drilling**
Date Started: **1/11/2016**
Ground Level: ----------
Drill Method: **CC to 0.19m, SFA (TC-Bit) to EOH**
Date Completed: **1/11/2016**
Easting: ----------
Equipment: **Hanjin D&B**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Consistency / Density	Moisture	Samples / Tests ID No.	Observations / Comments
CC		0.2				Fill	**CONCRETE SLAB**.				
Solid Flight Auger		0.4				Fill	**FILL**- Gravelly SAND / Sandy GRAVEL, brown, fine to coarse grained sand, fine to coarse gravel.	loose		SMC011116-1 0.2-0.3m	
		0.6				Natural	**SAND**- grey brown, fine to coarse grained sand.	loose	moist	SMC011116-2 0.4-0.5m	Possible Fill.
		0.8									
		1.0								SMC011116-3 0.9-1.0m	
		1.2									
		1.4								SMC011116-4 1.3-1.5m	
		1.6							very moist		
		1.8									
		2.0									
		2.2									
		2.4									
		2.6									
		2.8					**Weathered SANDSTONE**- orange brown & pale grey, medium to coarse.				
		3.0									
		3.2								SMC011116-5 3.0-3.3m	
		3.4									
		3.6									
		3.8									
		4.0					**Hole Terminated at 3.80m** Target depth.				Bore dry upon completion.

Moisture	
D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

No adverse odour or staining and no obvious ACM.

Logged By: **Stephen McCormack** Date: **1/11/2016**
Checked By: **Stephen McCormack** Date: **10/12/2016**

GEE DAVIES BH LOG BEXLEY NORTH.GPJ GEE.GDT 20/12/16 9:29:35 AM

Monitoring Well Log Report

Geo Environmental Engineering
82 Bridge St
Lane Cove NSW 2066
T 02 9420 3361

Hole ID. **BH102**
Hole Depth: **2.40 m**
Sheet: **1 of 1**

Project Name: **Geotechnical and Contamination Assessment**
Project Number: **E16016BN**
Location / Site: **307-311 Bexley Rd & 88-96 New Illawarra Rd, Bexley North NSW**
Client: **Tony Soueid**

Drilling Company: **Total Drilling**
Date Started: **1/11/2016**
Ground Level: ----------
Drill Method: **CC to 0.15m, SFA (TC-Bit) to EOH**
Date Completed: **1/11/2016**
Easting: ----------
Equipment: **Hanjin D&B**
Northing: ----------

Method	Depth (m)	Material Description	Consistency / Density	Moisture	Samples / Tests ID No.	Observations / Comments
CC		**CONCRETE SLAB**.				
Solid Flight Auger	0.2	**FILL**- Silty CLAY, dark grey to black, low to medium plasticity, pockets of sand and gravel (shale and slag).	soft to firm	moist	SMC011116-6 0.2-0.3m	
	0.4					
	0.6				SMC011116-7 0.6-0.7m	
	0.8					
	1.0				SMC011116-8 0.9-1.0m	
	1.2					
	1.4					
	1.6					Water seepage noted below 1.6m.
	1.8					
	2.0				SMC011116-9/10 1.8-2.0m	
	2.2	**SANDSTONE**- orange brown & pale grey, medium to coarse.				
	2.4					
	2.6	**Hole Terminated at 2.40m** Practical refusal.				
	2.8					
	3.0					

Material Type: Fill; Natural

Well Details: Gatic; 0.30; Bentonite; 0.80; 1.00; Coarse Sand; 50mm Ø Screen; 2.20

Well Construction

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

No adverse odour or staining and no obvious ACM.

Logged By: **Stephen McCormack** Date: **1/11/2016**
Checked By: **Stephen McCormack** Date: **10/12/2016**

GEE DAVIES BH LOG BEXLEY NORTH.GPJ GEE.GDT 20/12/16 9:29:36 AM

Borehole Log Report

Geo Environmental Engineering
82 Bridge St
Lane Cove NSW 2066
T 02 9420 3361

geo-environmental ENGINEERING

Hole ID. **BH103**
Hole Depth: **1.40 m**
Sheet: **1 of 1**

Project Name: **Geotechnical and Contamination Assessment**
Project Number: **E16016BN**
Location / Site: **307-311 Bexley Rd & 88-96 New Illawarra Rd, Bexley North NSW**
Client: **Tony Soueid**

Drilling Company: **Total Drilling**
Date Started: **1/11/2016**
Ground Level: ----------
Drill Method: **SFA (TC-Bit) to EOH**
Date Completed: **1/11/2016**
Easting: ----------
Equipment: **Hanjin D&B**
Northing: ----------

Method	Depth (m)	Material Description	Consistency / Density	Moisture	Samples / Tests ID No.	Observations / Comments
Solid Flight Auger	0.2	**ASHALT**.				
	0.4	**FILL**- Gravelly Clayey SAND, dark grey and brown. (Fill)	loose	moist	SMC011116-11/12 0.1-0.25m	
	0.6	**FILL**- Silty SAND, dark brown / dark grey, fine to coarse grained sand, trace clay. (Fill)	loose	moist	SMC011116-13/14 0.5-0.7m	
	1.0					
	1.2	**SANDSTONE**- grey & orange brown, medium to coarse. (Natural)				Insufficient quality sandstone for sampling.
	1.4					
	1.6	**Hole Terminated at 1.40m** Practical refusal.				Bore dry upon completion.
	1.8					
	2.0					
	2.2					
	2.4					
	2.6					
	2.8					
	3.0					

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

No adverse odour or staining and no obvious ACM.

Logged By: **Stephen McCormack** Date: **1/11/2016**
Checked By: **Stephen McCormack** Date: **10/12/2016**

GEE DAVIES BH LOG BEXLEY NORTH.GPJ GEE.GDT 20/12/16 9:29:37 AM

Borehole Log Report

Geo Environmental Engineering
82 Bridge St
Lane Cove NSW 2066
T 02 9420 3361

geo-environmental ENGINEERING

Hole ID. **BH104**
Hole Depth: **1.20 m**
Sheet: **1 of 1**

Project Name: **Geotechnical and Contamination Assessment** Project Number: **E16016BN**
Location / Site: **307-311 Bexley Rd & 88-96 New Illawarra Rd, Bexley North NSW** Client: **Tony Soueid**

Drilling Company: **Total Drilling** Date Started: **1/11/2016** Ground Level: ----------
Drill Method: **CC to 0.15m, SFA (TC-Bit) to EOH** Date Completed: **1/11/2016** Easting: ----------
Equipment: **Hanjin D&B** Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Consistency / Density	Moisture	Samples / Tests ID No.	Observations / Comments
CC							**CONCRETE SLAB**.				
Solid Flight Auger		0.2				Fill	**FILL**- Sandy GRAVEL, dark grey / black, fine to coarse grained sand, fine to coarse gravel.	loose	moist	SMC011116-15 0.2-0.3m	Coal-like fragments.
		0.4									
		0.6					**FILL**- SAND, yellow brown, fine to coarse grained sand.	loose	moist	SMC011116-16 0.5-0.65m	
		0.8									
		1.0					**FILL**- SAND, dark brown, fine to coarse grained sand, trace gravel.	loose	moist	SMC011116-17 0.8-0.95m	
		1.2									
		1.4					**Hole Terminated at 1.20m** Refusal on concrete.				Bore dry upon completion.
		1.6									
		1.8									
		2.0									
		2.2									
		2.4									
		2.6									
		2.8									
		3.0									

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

No adverse odour or staining and no obvious ACM.

Logged By: **Stephen McCormack** Date: **1/11/2016**
Checked By: **Stephen McCormack** Date: **10/12/2016**

GEE DAVIES BH LOG BEXLEY NORTH.GPJ GEE.GDT 20/12/16 9:29:38 AM

Monitoring Well Log Report

Geo Environmental Engineering
82 Bridge St
Lane Cove NSW 2066
T 02 9420 3361

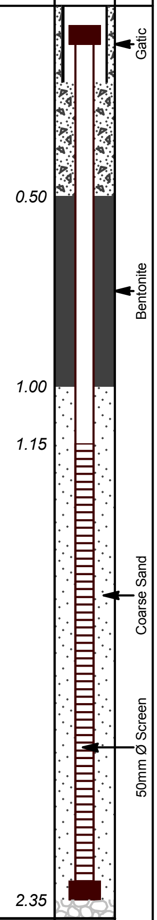
Hole ID.	**BH105**
Hole Depth:	**2.40 m**
Sheet:	**1 of 1**

Project Name:	**Geotechnical and Contamination Assessment**	Project Number:	**E16016BN**
Location / Site:	**307-311 Bexley Rd & 88-96 New Illawarra Rd, Bexley North NSW**	Client:	**Tony Soueid**

Drilling Company:	**Total Drilling**	Date Started:	**1/11/2016**	Ground Level:	----------
Drill Method:	**CC to 0.1m, SFA (TC-Bit) to EOH**	Date Completed:	**1/11/2016**	Easting:	----------
Equipment:	**Hanjin D&B**			Northing:	----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Consistency / Density	Moisture	Samples / Tests ID No.	Observations / Comments
CC		0.0–0.1				Fill	**CONCRETE SLAB.**				
Solid Flight Auger		0.1–0.6 (0.2, 0.4, 0.6)				Fill	**FILL**- Gravelly CLAY, dark brown, fine to coarse gravel, some sand.	firm	moist	SMC011116-18 0.1-0.2m; SMC011116-19 0.5-0.6m	
Solid Flight Auger		0.6–1.0 (0.8, 1.0)				Fill	**FILL**- Sandy CLAY, dark brown & brown, trace sand.	firm to stiff	moist	SMC011116-20 0.9-1.0m	
Solid Flight Auger		1.0–2.3 (1.2, 1.4, 1.6, 1.8, 2.0, 2.2)				Natural	**Sandy CLAY**- orange brown, fine to medium gravel. Becoming red brown & orange brown from 1.6m, medium to coarse grained sand.	stiff to very stiff	moist	SMC011116-21/22 1.1-1.25m; SMC011116-23 1.8-2.0m	
Solid Flight Auger		2.3–2.4 (2.4)				Natural	**SANDSTONE**- grey & orange brown, medium to coarse.				
		2.4–3.0 (2.6, 2.8, 3.0)					**Hole Terminated at 2.40m** Practical refusal.				Bore dry upon completion.

Well Details / Well Construction:



Moisture		Additional Comments
D	Dry	No adverse odour or staining and no obvious ACM.
Dp	Damp	
SM	Slightly Moist	
M	Moist	
VM	Very Moist	
W	Wet	
Sd	Saturated	

Logged By:	**Stephen McCormack**	Date:	**1/11/2016**	Checked By:	**Stephen McCormack**	Date:	**10/12/2016**

Borehole Log Report

Geo Environmental Engineering
82 Bridge St
Lane Cove NSW 2066
T 02 9420 3361

geo-environmental ENGINEERING

Hole ID. **BH106**
Hole Depth: **2.20 m**
Sheet: **1 of 1**

Project Name: **Geotechnical and Contamination Assessment**
Project Number: **E16016BN**
Location / Site: **307-311 Bexley Rd & 88-96 New Illawarra Rd, Bexley North NSW**
Client: **Tony Soueid**

Drilling Company: **Total Drilling**
Date Started: **1/11/2016**
Ground Level: ----------
Drill Method: **SFA (TC-Bit) to EOH**
Date Completed: **1/11/2016**
Easting: ----------
Equipment: **Hanjin D&B**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Consistency / Density	Moisture	Samples / Tests ID No.	Observations / Comments
Solid Flight Auger		0.2				Fill	**ASPHALT**.				
		0.4					**FILL**- Clayey Sandy GRAVEL, dark grey & brown, fine to coarse grained sand, fine to coarse gravel.	firm to stiff	moist	SMC011116-24 0.1-0.3m	
		0.6				Natural	**Sandy CLAY**- orange brown, fine to medium grained sand.	stiff	moist	SMC011116-25/26 0.7-0.9m	
		0.8									
		1.0									
		1.2									
		1.4								SMC011116-27 1.3-1.5m	
		1.6									
		1.8									
		2.0					**SANDSTONE**- grey & orange brown, medium to coarse.				
		2.2									
		2.4					**Hole Terminated at 2.20m** Practical refusal.				Bore dry upon completion.
		2.6									
		2.8									
		3.0									

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

No adverse odour or staining and no obvious ACM.

Logged By: **Stephen McCormack** Date: **1/11/2016**
Checked By: **Stephen McCormack** Date: **10/12/2016**

GEE DAVIES BH LOG BEXLEY NORTH.GPJ GEE.GDT 20/12/16 9:29:40 AM

Monitoring Well Log Report

Geo Environmental Engineering
82 Bridge St
Lane Cove NSW 2066
T 02 9420 3361

Hole ID. **BH107**
Hole Depth: **2.80 m**
Sheet: **1 of 1**

Project Name: **Geotechnical and Contamination Assessment**
Project Number: **E16016BN**
Location / Site: **307-311 Bexley Rd & 88-96 New Illawarra Rd, Bexley North NSW**
Client: **Tony Soueid**

Drilling Company: **Total Drilling**
Date Started: **1/11/2016**
Ground Level: ----------
Drill Method: **SFA (TC-Bit) to EOH**
Date Completed: **1/11/2016**
Easting: ----------
Equipment: **Hanjin D&B**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Consistency / Density	Moisture	Samples / Tests ID No.	Observations / Comments	Well Details	Well Construction
							Surface: Grass						
Solid Flight Auger		0.2				Fill	**TOPSOIL / FILL. Sandy SILT**- dark brown, fine to medium gravel, becoming pale brown with depth.	loose to medium dense	moist	SMC011116-29 0.1-0.2m			Gatic
		0.4											
		0.6								SMC011116-30 0.5-0.6m			
		0.8				Natural	**Silty CLAY**- red brown & orange brown, some fine to medium grained sand.	firm to stiff	moist	SMC011116-28 0.7-0.8m			
		1.0										1.00	
		1.2					**Sandy CLAY**- red brown & orange brown, medium to coarse grained sand, medium to coarse gravel.	stiff	moist				Bentonite
		1.4										1.45	
		1.6					**SANDSTONE**- grey & orange brown, medium to coarse.			SMC011116-31 1.5-1.6m		1.60	
		1.8											
		2.0											Coarse Sand
		2.2					**SANDSTONE**- pale grey, medium to coarse, weak zone, increased moisture.				Likely water bearing zone between 2.0 and 2.8m.		
		2.4											50mm Ø Screen
		2.6								SMC011116-35 2.5-2.8m			
		2.8											
		3.0					**Hole Terminated at 2.80m** Practical refusal.						

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

No adverse odour or staining and no obvious ACM.

Logged By: **Stephen McCormack** Date: **1/11/2016**
Checked By: **Stephen McCormack** Date: **10/12/2016**

GEE DAVIES BH LOG BEXLEY NORTH.GPJ GEE.GDT 20/12/16 9:29:41 AM

Borehole Log Report

Geo Environmental Engineering
82 Bridge St
Lane Cove NSW 2066
T 02 9420 3361

geo-environmental ENGINEERING

Hole ID. **BH108**
Hole Depth: **0.75 m**
Sheet: **1 of 1**

Project Name: **Geotechnical and Contamination Assessment** Project Number: **E16016BN**
Location / Site: **307-311 Bexley Rd & 88-96 New Illawarra Rd, Bexley North NSW** Client: **Tony Soueid**

Drilling Company: **GEE** Date Started: **1/11/2016** Ground Level: ----------
Drill Method: **Hand Auger to EOH** Date Completed: **1/11/2016** Easting: ----------
Equipment: **Manual** Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Consistency / Density	Moisture	Samples / Tests ID No.	Observations / Comments
							Surface: Grass				
Hand Auger		0.2				Fill	**TOPSOIL / FILL. Sandy Gravelly SILT**- dark grey, fine to medium grained sand, fine to coarse gravel.	loose to medium dense	slightly moist	SMC011116-32 0.0-0.15m	
		0.4				Natural	**Sandy CLAY / Clayey SAND**- red brown & orange brown, medium to coarse grained sand, with sandstone gravel.	stiff	moist	SMC011116-33 0.3-0.5m	
		0.6									
		0.8					**Hole Terminated at 0.75m** Practical refusal on weathered sandstone.				Bore dry upon completion.
		1.0									
		1.2									
		1.4									
		1.6									
		1.8									
		2.0									
		2.2									
		2.4									
		2.6									
		2.8									
		3.0									

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

No adverse odour or staining and no obvious ACM.

Logged By: **Stephen McCormack** Date: **1/11/2016**
Checked By: **Stephen McCormack** Date: **10/12/2016**

GEE DAVIES BH LOG BEXLEY NORTH.GPJ GEE.GDT 20/12/16 9:29:42 AM

Borehole Log Report

Geo Environmental Engineering
82 Bridge St
Lane Cove NSW 2066
T 02 9420 3361

geo-environmental ENGINEERING

Hole ID. **BH109**
Hole Depth: **1.35 m**
Sheet: **1 of 1**

Project Name: **Geotechnical and Contamination Assessment**
Project Number: **E16016BN**
Location / Site: **307-311 Bexley Rd & 88-96 New Illawarra Rd, Bexley North NSW**
Client: **Tony Soueid**

Drilling Company: **GEE**
Date Started: **1/11/2016**
Ground Level: ----------
Drill Method: **Hand Auger to EOH**
Date Completed: **1/11/2016**
Easting: ----------
Equipment: **Manual**
Northing: ----------

Method	Depth (m)	Material Description	Consistency / Density	Moisture	Samples / Tests ID No.	Observations / Comments
Hand Auger	0.2	**TOPSOIL / FILL. Clayey SILT**- dark brown, trace fine to coarse sandstone and coal gravel, roots. (Fill)	firm	moist	SMC011116-34 0.0-0.15m	Coal gravel.
	0.4					
	0.6				SMC011116-36 0.5-0.6m	Geofabric at 0.65m.
	0.8	**Sandy CLAY**- orange brown & red brown. (Natural)	firm to stiff	moist	SMC011116-37 0.7-0.85m	
	1.0					
	1.2					
	1.4	**Hole Terminated at 1.35m** Practical refusal on weathered sandstone.				Bore dry upon completion.
	1.6					
	1.8					
	2.0					
	2.2					
	2.4					
	2.6					
	2.8					
	3.0					

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

No adverse odour or staining and no obvious ACM.

Logged By: **Stephen McCormack** Date: **1/11/2016**
Checked By: **Stephen McCormack** Date: **10/12/2016**

GEE DAVIES BH LOG BEXLEY NORTH.GPJ GEE.GDT 20/12/16 9:29:42 AM

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: Tony Soueid
Project: 307-309 Bexley Road, Bexley North
Location: Refer to Drawing No. 15/3507

Project: 20749/6466C
Date : December 14, 2015
Logged: JK

BOREHOLE NO.: BH 1

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S1		ASPHALT/SANDY GRAVEL: dark grey, fine to medium grained sand, gravel FILL	GW		D
	@ 0.3 m		SILTY CLAY: dark grey with orange brown and light grey, medium to high plasticity, trace of gravel	CL	FIRM TO STIFF	M
	S2					
	@ 1.0 m	1.0	FILL			
			CLAYEY SAND: orange brown, fine to medium grained	SC	STIFF	M
	S3		SANDY CLAY: red brown/orange brown with light grey, fine to medium grained sand,	CL	VERY STIFF	M-VM
	@ 2.0 m	2.0	medium plasticity, trace of gravel			
		3.0	WEATHERED SANDSTONE: light grey with orange brown, fine to medium grained		EXTREMELY LOW STRENGTH	M-D
			AUGER REFUSAL AT 3.2 M ON WEATHERED SANDSTONE			
		4.0				
		5.0				

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Edson RP70
Hole Diameter (mm): 100
Angle from Vertical (°) 0

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: Tony Soueid	Project: 20749/6466C	**BOREHOLE NO.: BH 2**
Project: 307-309 Bexley Road, Bexley North	Date : December 14, 2015	Sheet 1 of 1
Location: Refer to Drawing No. 15/3507	Logged: JK	

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			ASPHALT/SANDY GRAVEL: dark grey, fine to medium grained sand, gravel FILL	GW	-	D
	S4 @ 0.5 m		SILTY CLAY: dark grey with dark brown and orange brown, medium to high plasticity, trace of gravel FILL	CL	-	M
			AUGER REFUSAL AT 0.6 M IN FILL			
		1.0				
		2.0				
		3.0				
		4.0				
		5.0				

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Edson RP70
Hole Diameter (mm): 100
Angle from Vertical (°) 0

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: Tony Soueid
Project: 307-309 Bexley Road, Bexley North
Location: Refer to Drawing No. 15/3507

Project: 20749/6466C
Date : December 14, 2015
Logged: JK

BOREHOLE NO.: BH 3

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S5/S6/S7 @ 0.3 m		CONCRETE: (220 mm thick)			
			GRAVELLY CLAY: dark brown/grey with light grey, red brown and orange brown, medium plasticity, trace of fine grained sand, some gravel	CL	VARIABLE	M
	S8 @ 1.0 m	1.0	FILL			
	S9 @ 1.8 m		SANDY CLAY: orange brown/red brown, fine to medium grained sand, medium plasticity, trace of gravel	CL	STIFF	M-VM
		2.0	SANDY CLAY: light grey with orange brown, fine to medium grained sand, medium plasticity	CL	STIFF	M
WT						
		3.0	SANDY CLAY: red brown, fine to medium grained sand, medium plasticity	CL	VERY STIFF	M
	S10 @ 4.0 m	4.0				
WT						W
			WEATHERED SANDSTONE: orange brown with light grey, fine to medium grained, clay seams		EXTREMELY LOW STRENGTH	M
		5.0	AUGER REFUSAL AT 5.0 M ON WEATHERED SANDSTONE			

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Edson RP70
Hole Diameter (mm): 100
Angle from Vertical (°) 0

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: Tony Soueid	Project: 20749/6466C	**BOREHOLE NO.: BH 4**
Project: 307-309 Bexley Road, Bexley North	Date : December 14, 2015	Sheet 1 of 1
Location: Refer to Drawing No. 15/3507	Logged: JK	

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S11		CONCRETE: (100 mm thick)			
	@ 02 m		GRAVELLY CLAY: dark grey with light grey and some orange brown, fine to medium grained sand, low plasticity, some gravel, ash	CL	VARIABLE	M
	S12		FILL			
	@ 0.7 m		CLAYEY SAND: orange brown, fine to medium grained	SC	FIRM TO STIFF	M-VM
		1.0				
			SANDY CLAY: red brown, fine to medium grained sand, low plasticity	CL	FIRM TO STIFF	M-VM
WT	S13					W
	@ 1.8 m				STIFF	
		2.0				
			WEATHERED SANDSTONE: red brown, fine to medium grained		EXTREMELY LOW STRENGTH	D
			AUGER REFUSAL AT 2.2 M ON WEATHERED SANDSTONE			
		3.0				
		4.0				
		5.0				

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Edson RP70
Hole Diameter (mm): 100
Angle from Vertical (°) 0

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: Tony Soueid
Project: 307-309 Bexley Road, Bexley North
Location: Refer to Drawing No. 15/3507

Project: 20749/6466C
Date : December 14, 2015
Logged: JK

BOREHOLE NO.: BH 5

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S14 @ 0.2 m		GRAVELLY CLAYEY SAND: dark brown with light brown, fine to medium grained, some gravel	CL	VARIABLE	D
	S15 @ 0.6 m		FILL SILTY CLAY: dark brown with dark grey and orange brown, medium plasticity, trace of gravel	CL	VARIABLE	M
		1.0	FILL AUGER REFUSAL AT 0.8 M ON CONCRETE			
		2.0				
		3.0				
		4.0				
		5.0				

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Edson RP70
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd
14/1 Cowpasture Place, Wetherill Park NSW 2164
Phone: (02)9756 2166 Fax: (02)9756 1137 Email: enquiries@smectesting.com.au

Dynamic Cone Penetrometer Test Report

Project: 307-309 BEXLEY ROAD, BEXLEY NORTH — Project No.: 20749/6466c
Client: TONY SOUEID — Report No.: 15/3507
Address: 47 Beaufort Street, Croydon Park — Report Date: 14/12/2015
Test Method: AS 1289.6.3.2 — Page: 1 of 1

Site No.	P1	P2	P3	P4	P5	
Location	Refer to Drawing No. 15/3507	Refer to Drawing No. 15/3507	Refer to Drawing No. 15/3507	Refer to Drawing No. 15/3507	Refer to Drawing No. 15/3507	
Starting Level	Surface Level	Surface Level	Surface Level	Surface Level	Surface Level	
Depth (m)	Penetration Resistance (blows / 150mm)					
0.00 - 0.15	*	*	*	*	2	
0.15 - 0.30	*	*	*	*	5	
0.30 - 0.45	2	2	4	3	22	
0.45 - 0.60	3	22	10	10	Refusal	
0.60 - 0.75	2	Refusal	22	22		
0.75 - 0.90	10		R	R		
0.90 - 1.05	11		*	*		
1.05 - 1.20	4		*	2		
1.20 - 1.35	4		*	2		
1.35 - 1.50	5		*	2		
1.50 - 1.65	5		3	3		
1.65 - 1.80	5		4	3		
1.80 - 1.95	10		5	4		
1.95 - 2.10	14		5	14		
2.10 - 2.25	16		5	22		
2.25 - 2.40	12		6	Refusal		
2.40 - 2.55	18		7			
2.55 - 2.70	17		10			
2.70 - 2.85	19		17			
2.85 - 3.00	22		22			
3.00 - 3.15	Refusal		Refusal			
3.15 - 3.30						
3.30 - 3.45						
3.45 - 3.60						
3.60 - 3.75						

Remarks: * Pre drilled prior to testing

NATA Accredited Laboratory Number 2750
Accredited for compliance with ISO/IEC 17025
The results of tests, calibrations and / or measurements included in this document are traceable to Australian / national standards

Technician: JK

Approved Signatory.....
Laurie Ihnativ - Manager