

# REPORT TO COUNCIL



**Date:** January 20, 2012  
**To:** City Manager  
**From:** Land Use Management, Community Sustainability (LT)  
**Application:** OCP11-0002 & Z11-0030      **Owner:** Risso Estates Ltd.  
**Address:** 1013 Barnes Ave      **Applicant:** Troika Developments Ltd.  
**Subject:** Rezoning & OCP Amendment

**Existing OCP Designation:** MRL - Multiple Unit Residential - Low Density  
**Proposed OCP Designations:** MRL - Multiple Unit Residential - Low Density &  
MRM - Multiple Unit Residential - Medium Density  
**Existing Zoning:** A1 - Agriculture 1  
**Proposed Zoning:** RM3 - Low Density Multiple Housing &  
RM5 - Medium Density Multiple Housing

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## 1.0 Recommendation

THAT OCP Bylaw Amendment No. OCP 11-0002 to amend Map 4.1 of the Kelowna 2030 - Official Community Plan Bylaw No. 10500, by changing the Future Land Use designation of a portion of Lot B, District Lot 134, ODYD, Plan KAP91847, located at 1013 Barnes Avenue, Kelowna, BC from the Multiple Unit Residential (Low Density) designation to the Multiple Unit Residential (Medium Density) designation, as shown on Map "A" attached to the report of Land Use Management Department dated January 20, 2012, be considered by Council;

AND THAT Council considers the APC public process to be appropriate consultation for the purpose of Section 879 of the Local Government Act, as outlined in the Report of the Land Use Management Department dated January 20, 2012;

AND THAT Rezoning Application No. Z11-0030 to amend the City of Kelowna Zoning Bylaw No. 8000, by changing the zoning classification of portions of Lot B, District Lot 134, ODYD, Plan KAP91847, located at 1013 Barnes Avenue, Kelowna, BC from the A1 - Agriculture 1 zone to the RM3 - Low Density Multiple Housing and RM5 - Medium Density Multiple Housing zones, as shown on Map "B", be considered by Council;

AND THAT the Official Community Plan Amending Bylaw and the Zone Amending Bylaw be forwarded to a Public Hearing for further consideration;

AND THAT final adoption of the Zone Amending Bylaw be considered in conjunction with Council's consideration of a Development Permit on the subject property;

AND FURTHER THAT final adoption of the Zone Amending Bylaw be considered subsequent to the requirements of the Development Engineering Branch and Infrastructure Planning (Parks & Public Spaces) being completed to their satisfaction.

## 2.0 Purpose

The applicant is proposing to amend the Official Community Plan future land use designation for a portion of the subject property from Multiple Unit Residential - Low Density (MRL) to Multiple Unit Residential - Medium Density (MRM). Also proposed is a rezoning of the subject property from the A1 - Agriculture 1 zone to the RM3 - Low Density Multiple Housing and RM5 - Medium Density Multiple Housing zones in order to facilitate a multiple unit residential development, including a mix of townhomes and apartments.

## 3.0 Land Use Management

Originally, the application contemplated a MRM future land use designation and RM4 zoning across the entire site. However, based on staff direction, the application has been amended to improve the transition between the property and adjacent land uses to the north and west.

This amended plan, including a conceptual site plan is attached to this report. The balance of the plans attached (including building renderings and landscape plan) are conceptual in nature, and reflect the original site-wide RM4 proposal. These are provided for additional detail and context, but do not represent the ultimate development programming. As noted below, formal Development Permit drawings are to be submitted following favorable consideration of the land use proposed.

The proposed MRL (RM3) and MRM (RM5) split across the site is generally consistent with a draft zoning layout considered during property appraisals associated with the park acquisition, and is also generally consistent with the proportion of MRM-designated land that had been present on the previous OCP future land use designation for this area.

As supported in OCP2030, ground-orientated housing is highly-desirable in this location, as well as other similar locations throughout the city. While typically ignored in favor of apartment construction during the recent housing boom, townhome development offers a viable, affordable alternative to single-family dwellings, particularly in areas within, or in close proximity to, an Urban Centre. This housing form is typically developed on lands designated as MRL. Unfortunately, MRL-designated lands are constantly under pressure for higher-density uses in order to achieve greater development profit where land values have increased. This on-going pressure on the overall supply of vacant MRL lands may limit the potential for new, ground-orientated housing units in the future.

The proposed layout achieves an acceptable level of transition between the existing neighborhood to the north and the school site to the west while preserving an RM5 parcel fronting Mission Springs Drive. The RM3 townhome development would provide a critical need in this sector of the City, and attract families that will benefit from the proximity of the school site and other amenities in a close radius. Aside from the townhome units offered in the RM3 portion of the site, the conceptual site plan also includes ground-orientated units along the perimeter of the multi-storey apartment buildings.

The applicant has opted to not submit a Development Permit application at this time in order to first publicly test their land use scenario prior to investing in full DP drawings, however a complete Urban Design Development Permit application will be required prior to final adoption of the OCP amendment and rezoning. As this is a green field site with few constraints, it is expected that the development of the site would meet all Zoning Bylaw requirements and not require any variances.

Key considerations in the urban design review process will include achieving an appropriate interface and transition to neighbouring land uses and the park interface, as well as maximizing



the amount of green space on-site. Important areas of evaluation will include the quality of the development's integration with both the neighbouring single family development across Barnes Avenue and the future park site to the south.

#### 4.0 Proposal

##### 4.1 Background

The subject property was created as a result of a subdivision of the former 10.18 acre parcel which extended from Casorso Road north to Barnes Avenue. In February 2011, the City of Kelowna acquired 4.22 acres at the southern end of the site for future community park space, as well as the northern extension of Mission Springs Drive across Casorso Road. The remaining 5.95 acres were retained by the property owners for future development. During the acquisition process, former OCP 2020 prescribed future land use designations for the property at approximately 50% - Multiple Unit Residential-Low Density (MRL), 25% - Multiple Unit Residential-Medium Density (MRM) and 25% Major Park/Open Space. OCP 2030 revised the land use designations to reflect the ultimate parkland acquisition of the southern half of the site, with the remainder designated as MRL. The parkland acquisition valuation included a blend of the MRL and MRM designations to reflect the development potential over the entire property.

##### 4.2 Project Description

The applicant proposes to rezone the subject property from the existing A1 - Agriculture 1 zone to the RM3 - Low Density Multiple Housing and RM5 - Medium Density Multiple Housing zones. The rezoning would accommodate a mix of townhome and apartment housing. To achieve the requested zoning, an amendment to the OCP future land use designation is required. The proposal includes amending the southeast portion of the property from the MRL to the MRM future land use designation. After road dedication, the proposed MRM lands would represent approximately 48% of the development site, with the MRL designation being maintained on the remaining 52%.

As required, the applicant has provided a Traffic Impact Analysis. The two major off-site transportation infrastructure improvements proposed within the Development Engineering Branch requirements are the construction of Mission Springs Drive from Casorso Road to Barnes Avenue (as per the existing road reserve), as well as a raised concrete median along Gordon Dr (at Barnes Avenue) to restrict turning movements to "right-in, right-out" only at the Barnes/Gordon intersection.

Through the conceptual development plan provided, the applicant is proposing a mix of apartment and townhouse residential units for the subject property; specifically 43 townhouses, 17 ground-oriented apartments fronting the parkade, and 102 apartments in two buildings. A large, at-grade parkade is proposed between the two apartment buildings. A common, landscaped amenity area is proposed for the parkade roof.

A density transition to Casorso Elementary School and Barnes Ave, and the single detached housing neighbourhood, is proposed to be fulfilled with ground-oriented townhomes which are limited to the same height as dwellings constructed in single-family zones (lesser of 9.5 m or 2 ½ storeys). The portion of the project proposed for apartment buildings is situated adjacent to the future Mission Springs Dr and toward existing RM5 development at Missonwood Retirement Resort and the Mission Meadows apartment complex.



The proposed development compares with the Zoning Bylaw No. 8000 requirements for the RM3 and RM5 zones as follows:

Criteria	RM3		RM5	
	Req. / Max.	Proposed	Req. / Max.	Proposed
Lot Width	30.0 m	~ 150 m	30.0 m	~ 180 m
Lot Depth	30.0 m	~ 40 to 115 m (irregular)	35.0 m	~ 90 m
Lot Area	900 m <sup>2</sup>	~ 10,750 m <sup>2</sup>	1400 m <sup>2</sup>	~ 10,015 m <sup>2</sup>
FAR	0.5 + up to 0.2 additional for covered parking	~ 0.68	1.1 + up to 0.2 additional for covered parking	~ 1.3
Height	Lesser of 9.5 m or 2 ½ storeys	TBD - Appears to comply.	Lesser of 16.5 m or 4 storeys	TBD - Appears to comply.

### 4.3 Site Context

The subject property is located on the south side of Barnes Avenue and is also adjacent to the future extension of Mission Springs Drive from Casorso Road to Barnes Avenue. Land uses in the surrounding neighbourhood are predominantly residential, with a single detached housing neighbourhood present to the north, and apartments present to the east along the Gordon Drive major arterial. Specifically, the adjacent zones and land uses are:

Direction	Zone	Land Use
North	RU2 - Medium Lot Housing	Single detached dwellings
South	A1 - Agriculture 1	Farm (future park)
East	RM5 - Medium Density Multiple Housing	Missionwood Retirement Resort & Mission Meadows
West	P2 - Education and Minor Institutional	Casorso Elementary School



City of Kelowna - Accuracy and correctness not guaranteed.



**5.0 Current Development Policies**

**5.1 Kelowna Official Community Plan (OCP)**

The subject property is designated as Multiple Unit Residential - Low Density for future land use. Relevant policies are included below.

**Residential Land Use Policies:**

Policy 5.23.1 - Ground-Oriented Housing. Encourage all multi-unit residential buildings in neighbourhoods with schools and parks to contain ground-oriented units with 2 or more bedrooms to provide a family housing choice within multi-unit rental or ownership markets. High density residential projects in the Downtown area are encouraged to include a ground-oriented housing component, especially where such can be provided on non-arterial and non-collector streets.

**OCP Amendment Application Policies:**

Policy 5.40.1 - Evaluation Checklist. Evaluate development applications that require an OCP amendment on the basis of the extent to which they comply with underlying OCP objectives, including the following:

Consideration:	Response:
Does the proposed development contribute to preserving lands with slopes greater than 30%?	Not applicable.
Does the proposed development respect the OCP Permanent Growth Boundary (OCP Map 4.1)?	Yes.
Does the proposed development feature a mix of residential, employment, institutional, and/or recreational uses within individual buildings or larger development projects?	Mix of residential unit types proposed.
Is the proposed development located in an Urban Centre?	No.
Does the proposed development increase the supply of affordable (as defined in the OCP) apartments or townhouses?	Unlikely to meet CMHC affordability benchmark.
Is the property serviced with water and City sanitary sewer at the time of application?	No, however services are adjacent.
Could the proposed project be built at no financial cost to the City? (including operational and maintenance costs.)	Financial impact not anticipated.
Would the proposed project help decrease the rate of travel by private automobile, especially during peak hours?	No.
Is there transit service within 400 metres of non-residential projects or major employment generators (50+ employees)?	Not applicable.
Does the proposed project involve redevelopment of currently under-utilized, urbanized land?	Greenfield development, adjacent to existing urban development.
Does the proposed project result in the creation of substantially more public open space than would be available if the development were not to proceed (not including required open space dedications or non-developable areas)?	No.
Is there a deficiency of properties within the applicable Sector (see Map 5.4) that already have the required OCP designation?	No perceived undersupply of MRM lands in the area.

Does the project avoid negative impacts (shadowing, traffic, etc.) on adjoining properties where those adjoining properties are not slated for land use changes?	Yes. Design impacts to be mitigated through DP process.
Is the project consistent with the height principles established in the OCP?	Yes, assuming variances are not proposed through DP process.
If the project goes ahead, would surrounding property owners be likely to develop their properties as per OCP Future Land Use and other City policy provisions?	Potential for pressure for increased density on properties to the north and west.
Would approval of the project enhance the surrounding neighbourhood?	Improvement to the neighbourhood unclear (compared to fully MRL development).
Could the project be supported without over-burdening existing park and other community resources or threatening the viability of existing neighbourhood resources?	Negative impacts not anticipated in this regard.

## 6.0 Technical Comments

### 6.1 Building & Permitting Branch

Detailed comments to be provided at Development Permit stage. Preliminary concept drawings insufficient for comprehensive review, however, some Building Code and access/exiting issues are noted in the conceptual plans.

### 6.2 Development Engineering Branch

See attached Memorandum.

### 6.3 Fire Department

Fire department access, fire flows, and hydrants as per the BC Building Code and City of Kelowna Subdivision Bylaw #7900. The Subdivision Bylaw requires a minimum of 150ltr/sec flow. There should be one civic address for each of the buildings and individual suite numbers for all the occupancies. Additional comments will be required at the building permit application. A detailed site plan and building code analysis is required to confirm the 3-15M fire department access required to all the buildings as per 3.2.5 of the BCBC. Buildings 6, 7 & 8 appear to have limited or no fire fighting access.

### 6.4 Infrastructure Planning (Parks & Public Spaces)

The Parks & Public Spaces Branch will work with the applicant to develop a partnership arrangement for the future Casorso Park. This could include collaboration on a concept design plan to establish a strong relationship between the park and the proposed development.

## 7.0 Application Chronology

Date application received:	May 6, 2011
Advisory Planning Commission:	June 21, 2011
Traffic Impact Analysis (TIA) requested:	June 19, 2011
Draft TIA received:	August 22, 2011
TIA comments provided to applicant:	September 23, 2011
Revised TIA received:	October 20, 2011



Final TIA received: November 4, 2011  
TIA approval: November 18, 2011  
Additional information provided by applicant: January 10, 2012

The above noted application was reviewed by the Advisory Planning Commission at the meeting on June 21, 2011 and the following recommendations were passed:

THAT the Advisory Planning Commission support Official Community Plan Amendment Application No. OCP11-0002, for 1013 Barnes Avenue, to amend the OCP future land use for a portion of the subject property from Multiple Unit Residential - Low Density (MRL) to Multiple Unit Residential - Medium Density (MRM) in order to facilitate a mixed townhouse and apartment residential development.

THAT the Advisory Planning Commission support Rezoning Application No. Z11-0030, for 1013 Barnes Avenue, to rezone the subject property from the A1 - Agriculture 1 zone to the RM3 - Low Density Multiple Housing and RM5 - Medium Density Multiple Housing zones in order to facilitate a mixed townhouse and apartment residential development.

**APC Comment:**

The APC supported the Rezoning and Official Community Plan Amendment Application; however, encouraged the Applicant to continue working with the neighbourhood to refine the development plan that meets the needs of both the neighbourhood and the Applicant. As well, to ensure a safe and efficient traffic pattern for the abutting subdivisions to the north and the subject property under application. In addition, the traffic analysis should include evaluation of the Casorso school drop off zone.

**Report prepared by:**



Luke Turri, Urban Land Use Planner

**Reviewed by:**



Danielle Noble, Manager, Urban Land Use

**Approved for Inclusion:**



Shelley Gambacort, Director, Land Use Management

**Attachments:**

Subject Property Map  
Map "A" - Proposed OCP Amendment  
Map "B" - Proposed Zoning Amendment  
Development Engineering Branch Memorandum

*Other conceptual plans provided for information only:*

Site Plan  
Landscape Plan  
Development Renderings



Certain layers such as lots, zoning and dp areas are updated bi-weekly. This map is for general information only.  
 The City of Kelowna does not guarantee its accuracy. All information should be verified.



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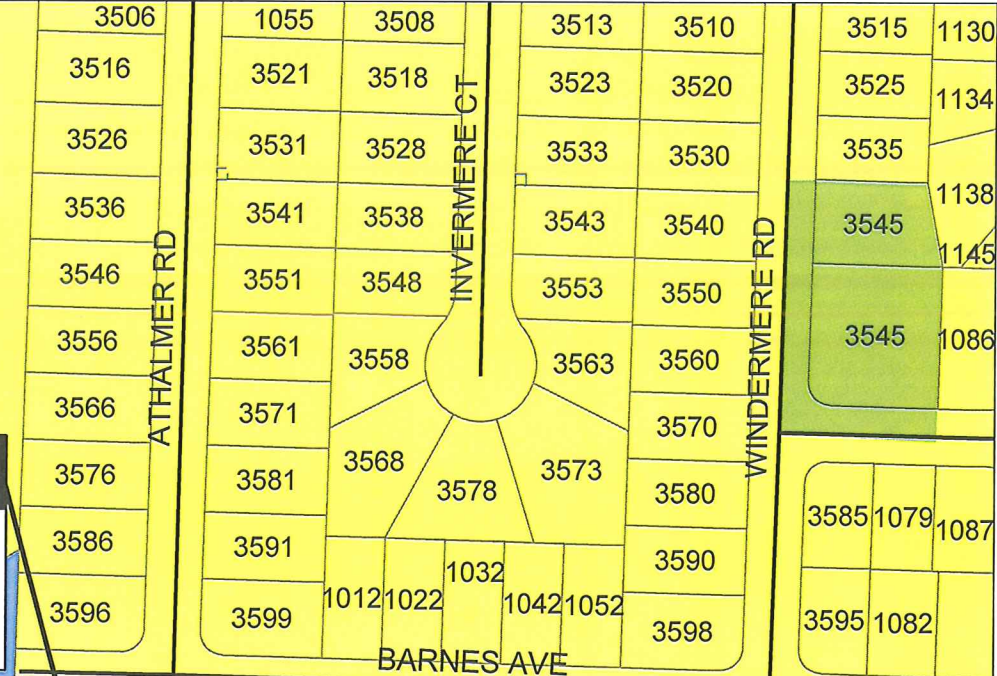


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**Subject Property Note:**

- Amend the OCP for a portion of the subject property from Multiple Unit Residential (Low Density) MRL to Multiple Unit Residential (Medium Density) MRM



ATHALMER RD

INVERMERE CT

WINDERMERE RD

BARNES AVE

3675 EDINST

1013

MRL

1075

3715 PARK

MRM

3731-3739

GORDON DR

3661

CASORSO RD

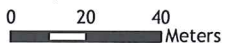
SPRINGSIDE CT

MISSION SPRINGS DR

**MAP "A" OCP AMENDMENT  
OCP11-0002**

- Education / Institutional
- Multiple Unit Residential (Medium Density)
- Multiple Unit Residential (Low Density)
- Major Park and Open Space
- Single / Two Unit Residential
- Portion of Subject Property
- Subject Property
- Legal Parcel
- Easement

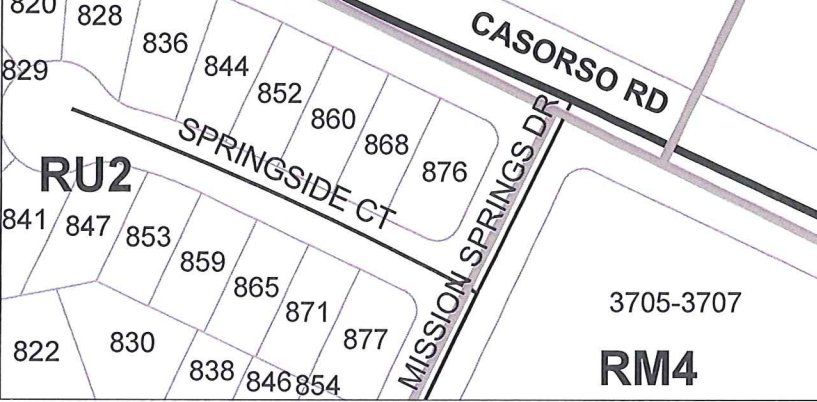
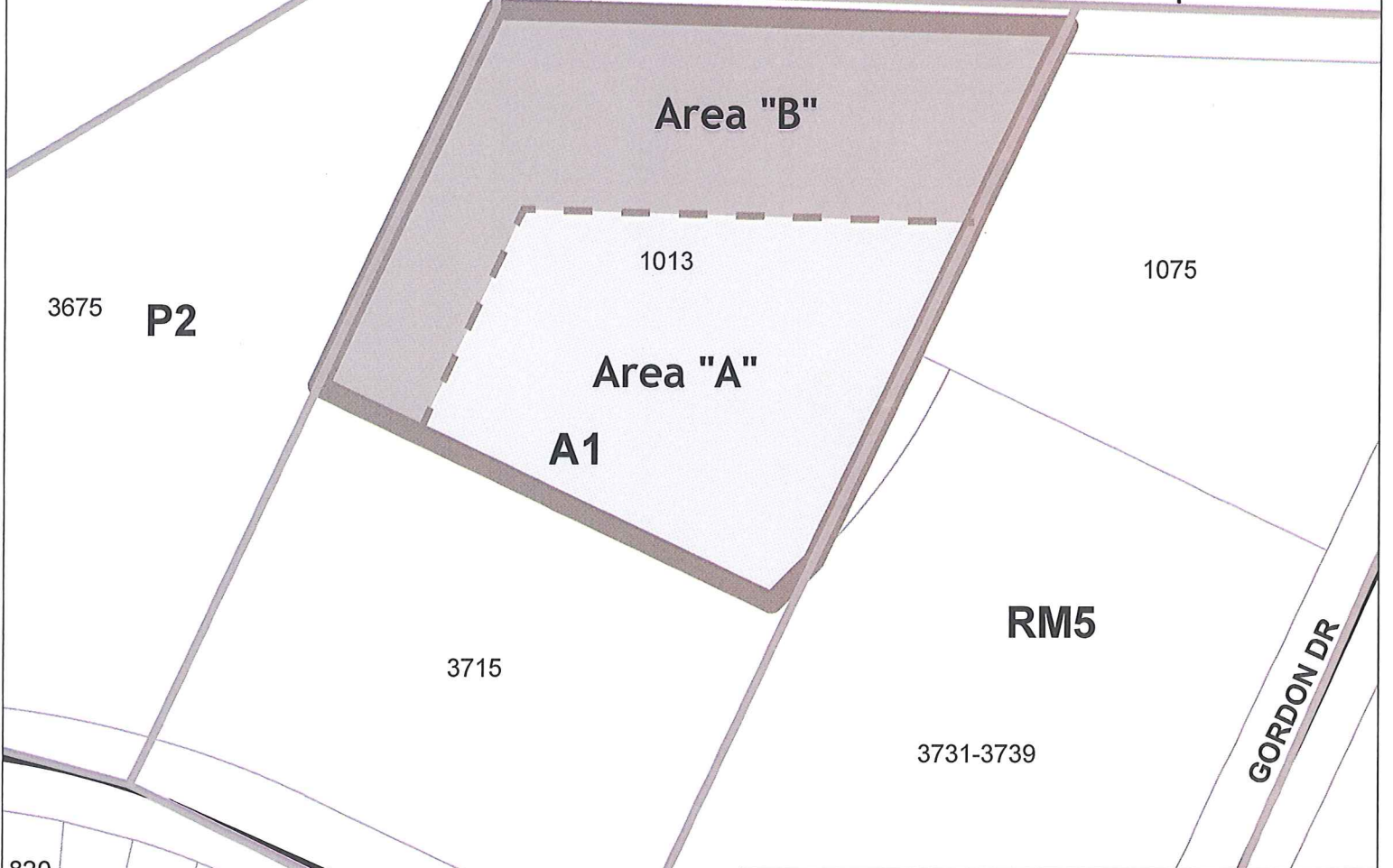
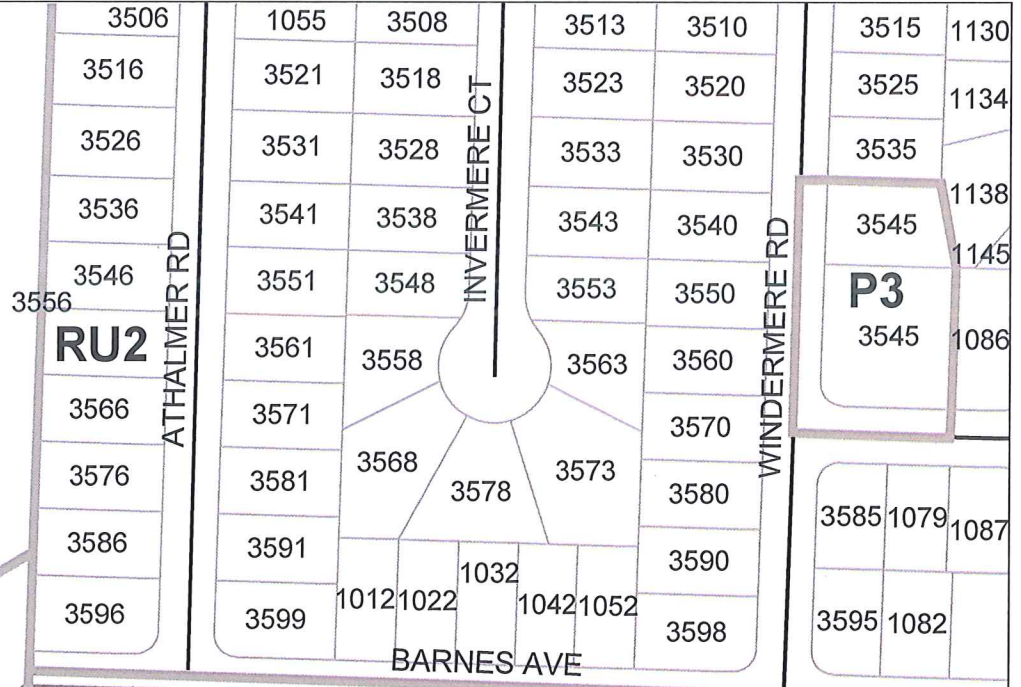
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Rev. Jan 18/12



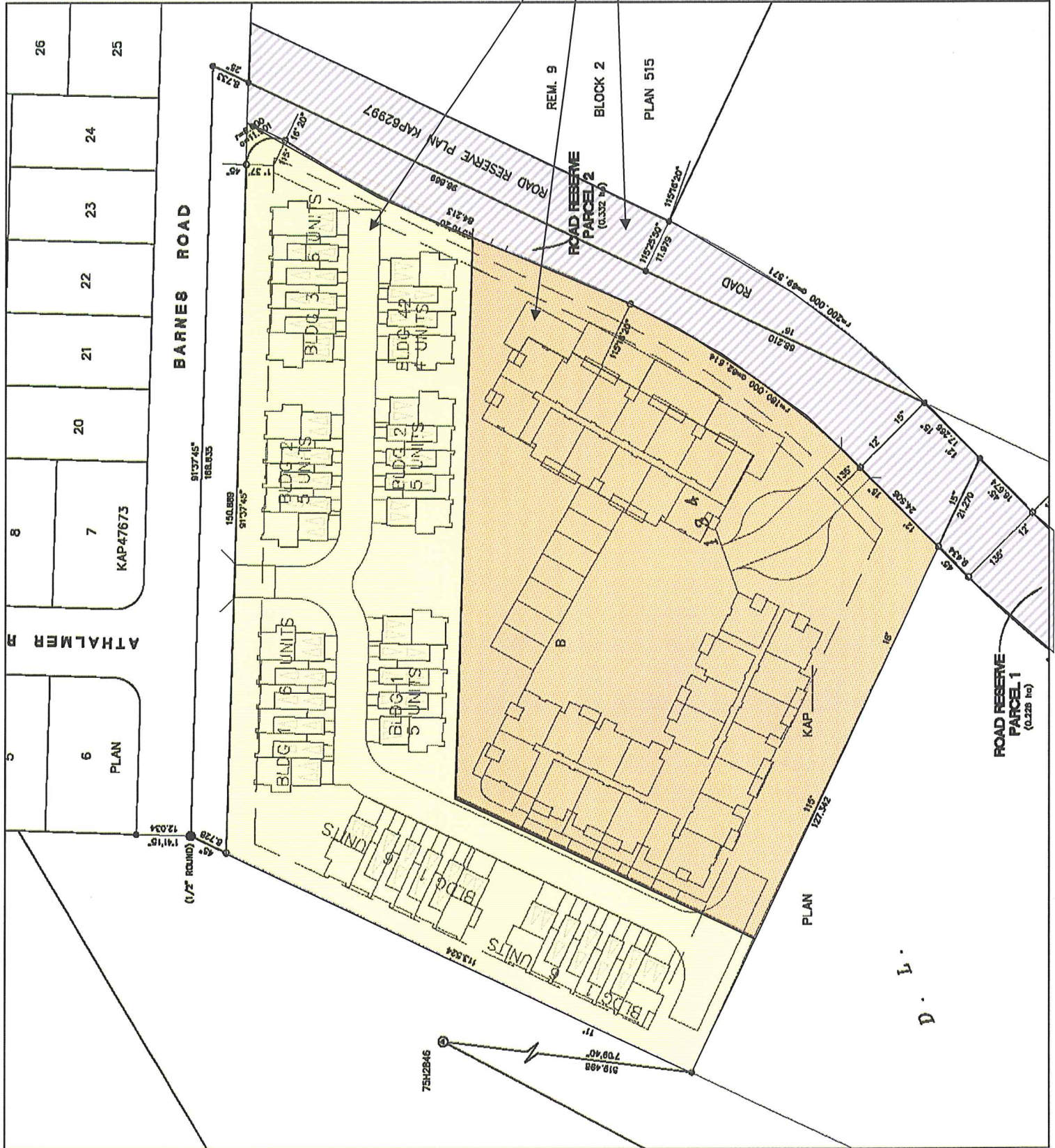




**MAP "B" PROPOSED ZONING**  
Application #Z11-0030

- Subject Property
- Area "A" A1 to RM5
- Zoning
- Area "B" A1 to RM3
- Legal Parcel





RM3

RM5

Mission Springs Drive Extension

OCP11-0002/  
 Z11-0030

1013 Barnes Avenue

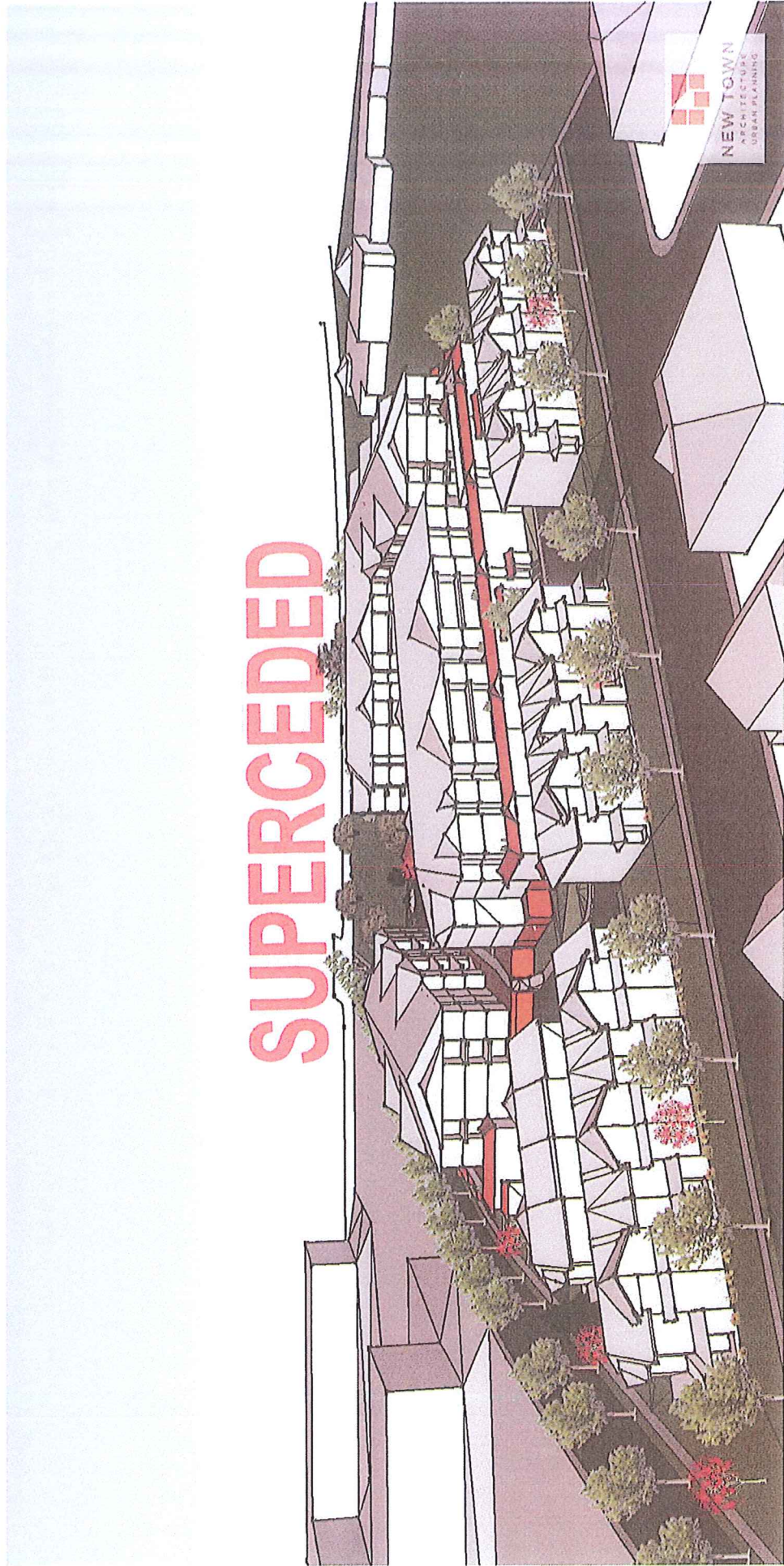
Site Plan







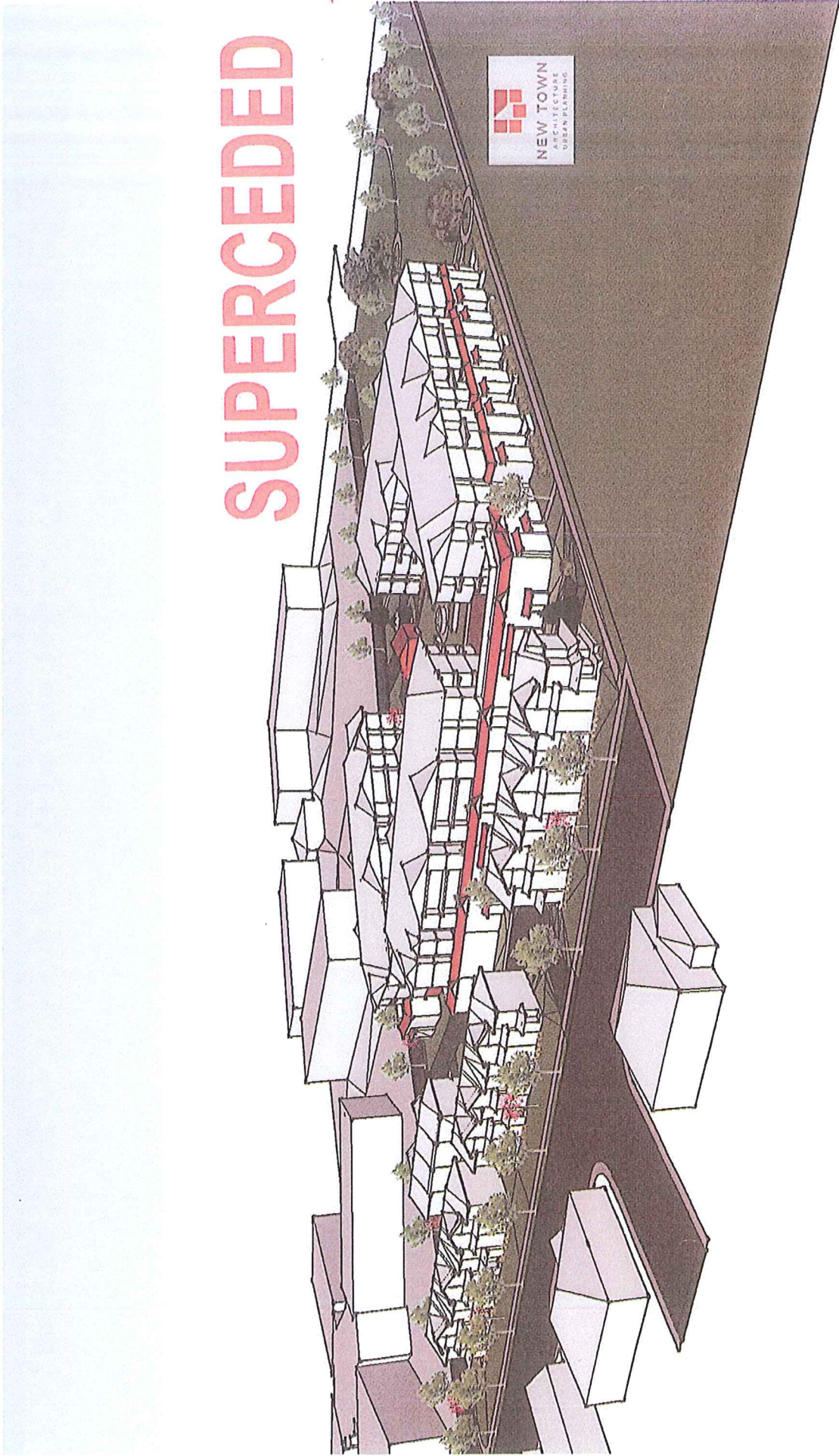
# SUPERCEDED



BARNES AVE STREET FACE - FROM ABOVE



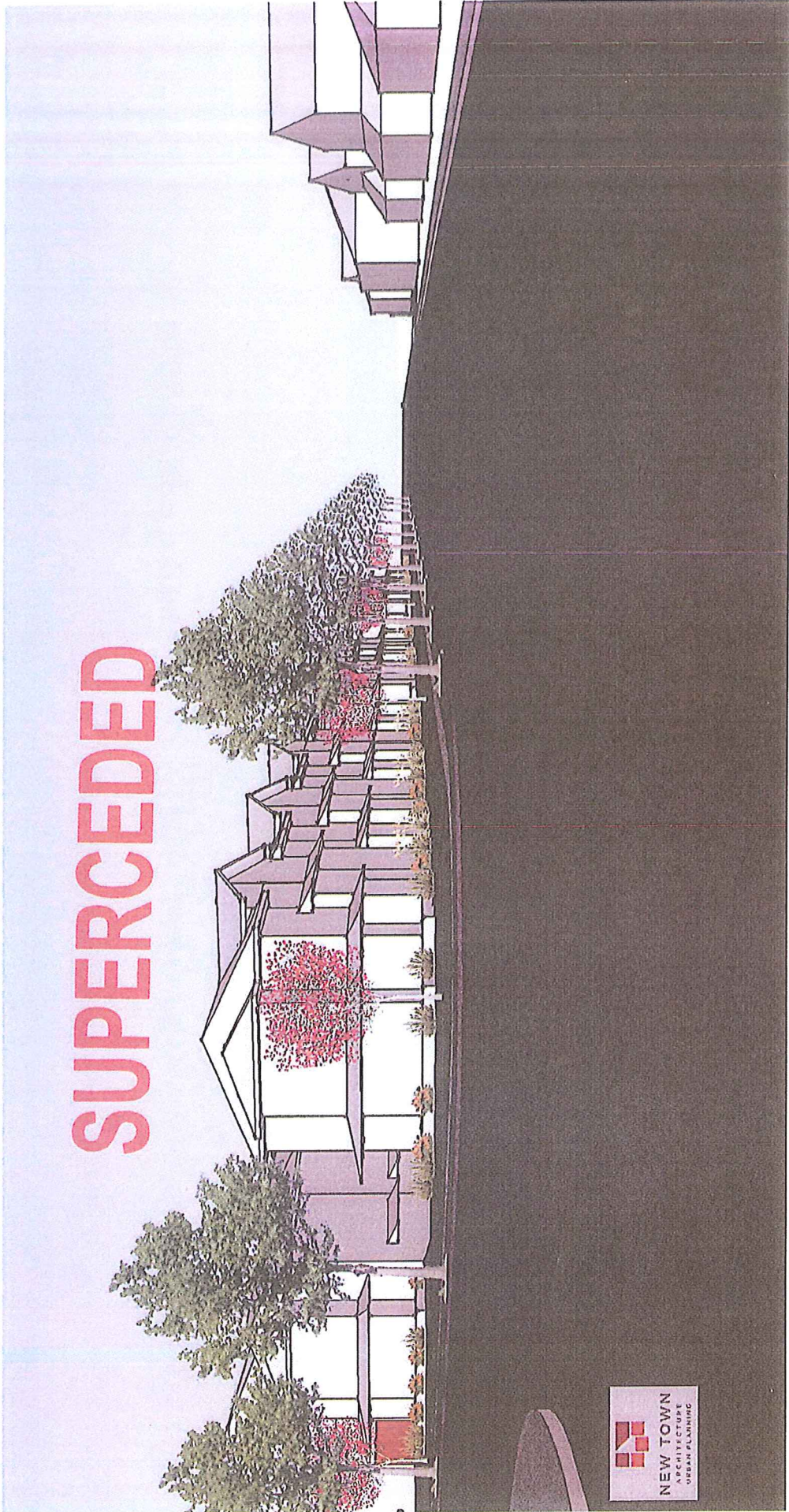
# SUPERCEDED



BARNES AVE STREET FACE — FROM ABOVE



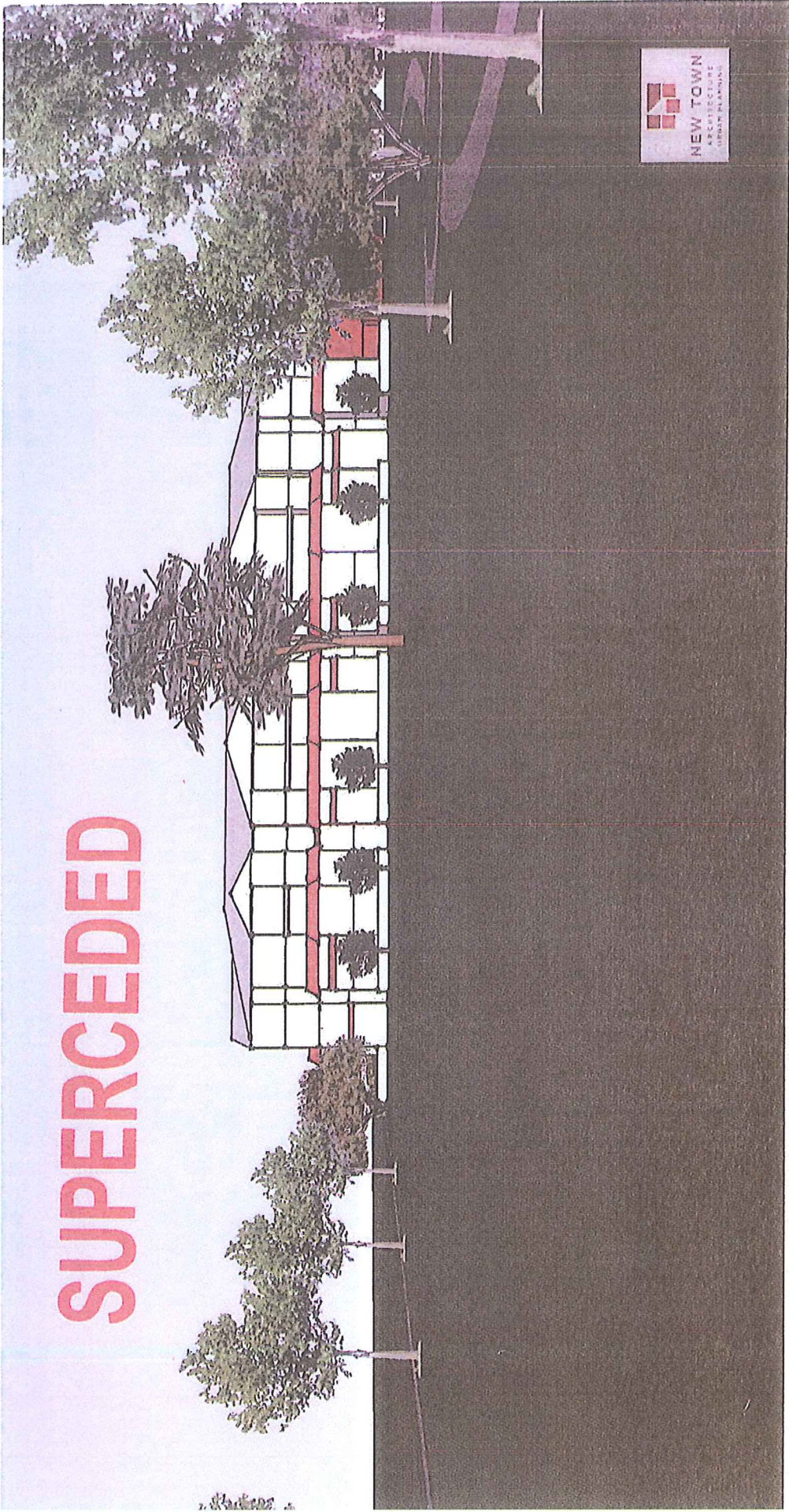
**SUPERCEDED**



WEST TOWN BARNES ROAD  
LOOKING WEST ALONG BARNES AVE



# SUPERCEDED

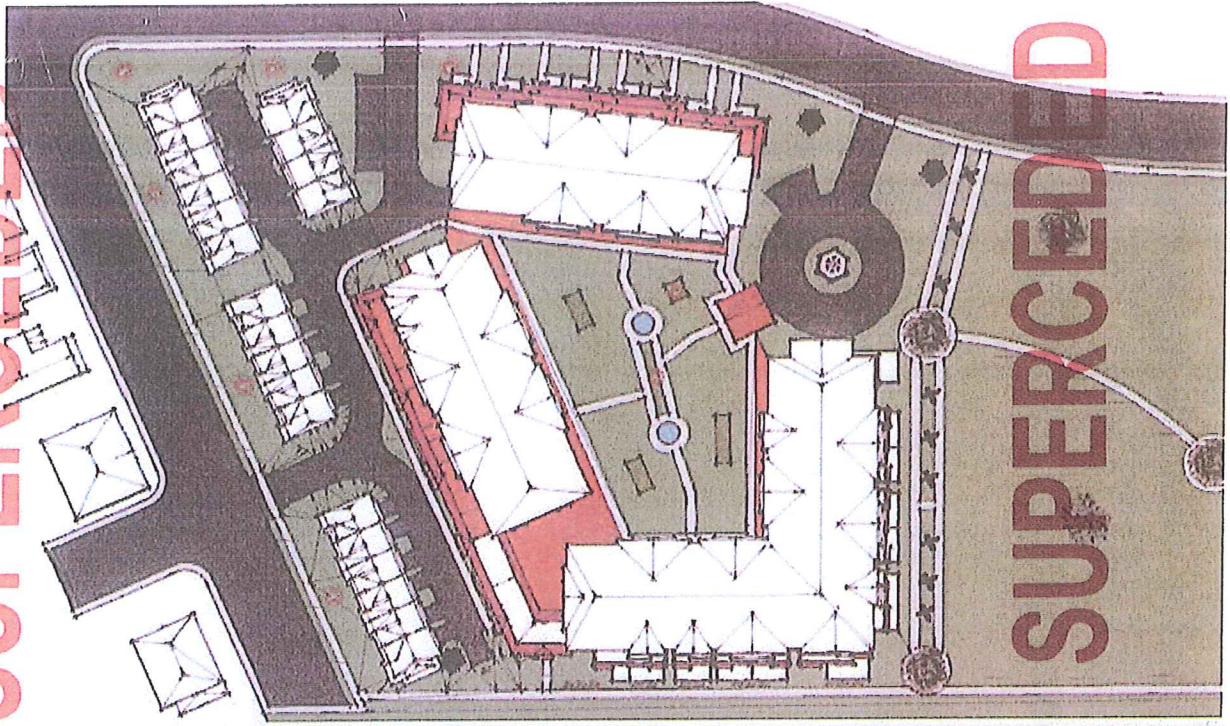


ASKING NORTH FROM PAMEL MESA

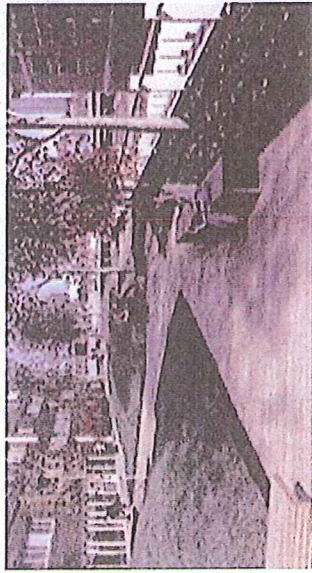
LOOKING NORTH FROM FUTURE PARK



SUPERCEDED



SUPERCEDED



LINEAR GREEN SPACES  
(TOWNHOUSE FRONTAGE)



NEW TOWN  
Urban Redevelopment



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**CITY OF KELOWNA**  
**MEMORANDUM**

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**Date:** November 25, 2011  
**File No.:** Z11-0030  
**To:** Planning & Development Services Department (AW)  
**From:** Development Engineering Manager  
**Subject:** 1013 Barnes Avenue, Mission Springs Rd Lot B PL. 91847 **Green Square**

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Development Engineering has the following comments and requirements associated with this application to rezone the subject parcel to RM4. The road and utility upgrading requirements outlined in this report will be a requirement of this development.

The Development Engineering Technologist for this project is John Filipenko. AScT

1. Domestic Water and Fire Protection

- (a) The developer's consulting mechanical engineer will determine the domestic and fire protection requirements of this proposed development and establish hydrant requirements and service needs.
- (b) Only one service will be permitted for this development. The applicant, at his cost, will arrange for the installation of fire hydrants and a new metered water service.
- (c) The construction of a watermain within the new Mission Springs Road will likely be required to achieve the required fire flows and hydrant coverage. The estimated cost for bonding purposes is **\$120,000.00**
- (d) Landscaped boulevards, complete with underground irrigation systems, must be integrated with the on-site irrigation system.
- (e) This property is not within a water specified area. A **\$250.00** application fee is required to cover the cost of a service boundary amendment

2. Sanitary Sewer

- (a) The developer's consulting mechanical engineer will determine the development requirements of this proposed development and establish the service needs. The applicant, at his cost, will arrange for the installation of one new larger service, as well as the capping of all existing unused services at the mains. Only one service will be permitted for this development.



- (b) The construction of an adequately sized sanitary sewer main within the new Mission Springs Road right-of-way will likely be required from the existing main within Casorso road to the south boundary of the subject property. The estimated cost for bonding purposes is **\$55,000.00**
- (c) This property is not within a sanitary sewer specified area. A **\$250.00** application fee is required to cover the cost of a service boundary amendment.

### 3. Storm Drainage

- (a) It will be necessary to construct storm drainage facilities within Barnes Avenue to accommodate road drainage fronting the proposed development. The cost is included in the Road upgrading item.
- (b) It will be necessary to construct a piped storm drainage system within Mission Springs Road to accommodate road drainage. The cost is included in the Road upgrading item.
- (c) The developer must engage a consulting civil engineer to provide a storm water management plan which meets the requirements of the City Storm Water Management Policy and Design Manual.
- (d) Storm drainage systems and an overflow service for the site will be reviewed and approved by Engineering when a site servicing design is submitted.

### 4. Road Improvements

- (a) The Widening of Barnes Avenue will require the frontage upgrading to a full urban standard including a monolithic concrete sidewalk, curb and gutter, storm drainage system including catch basins and manholes, pavement widening, street lighting, landscape boulevard complete with trees and underground irrigation and re-location or adjustment of existing utility appurtenances if required to accommodate the upgrading construction. The estimated cost for bonding purposes is **\$85,000.00**
- (b) Mission Springs Road must be constructed from Barnes Rd to Casorso Rd. This development must dedicate and construct to a full urban standard including curb and gutter, monolithic sidewalk, storm drainage pipe catch basins, manholes / drywells, pavement, landscaped boulevard complete with underground irrigation system, street lights as required and re-location or adjustment of existing utility appurtenances if required to accommodate the upgrading construction. The estimated cost for bonding purposes is **\$378,000.00**
  - (i) The City has in place security for the construction and full urbanization of one half of Mission Springs Road (east side).
  - (ii) The developer is required to construct Mission Springs Road fronting Lot A Plan 91847 to a rural standard.



5. Road Dedication and Subdivision Requirements

By registered plan to provide the following:

- (a) Dedicate Mission Springs Rd widening along the subject property as presently identified as a road reserve.
- (b) Dedicate Barnes Avenue widening along the subject property as presently identified as a road reserve.
- (c) Grant statutory rights of way if required for utility services.

6. Electric Power and Telecommunication Services

The electrical and telecommunication services to the buildings as well as the local distribution wiring must be installed in an underground duct system, and the building must be connected by an underground service. It is the developer's responsibility to make a servicing application with the respective electric power, telephone and cable transmission companies to arrange for these services which would be at the applicant's cost.

7. Street Lighting

Street lighting including underground ducts must be installed on all roads fronting on the proposed development. The cost of this requirement is included in the roads upgrading item.

8. Engineering

Road and utility construction design, construction supervision, and quality control supervision of all off-site and site services including on-site ground recharge drainage collection and disposal systems, must be performed by an approved consulting civil engineer. Designs must be submitted to the City Engineering Department for review and marked "issued for construction" by the City Engineer before construction may begin.

9. Latecomer Protection

Under provisions of Section 990 of the BC Municipal Act, and in conformance with the City of Kelowna Subdivision Development & Servicing Bylaw No. 7900, the owner is eligible to apply for latecomer protection for the following:

- (a) Watermain construction on Mission Springs Road.
- (b) Storm drainage construction on Mission Springs Road.
- (c) Sanitary main construction on Mission Spring Road.
- (d) Road construction on Mission Spring Road.

10. Geotechnical Report

As a requirement of this application, the applicant must provide a comprehensive geotechnical report prepared by a Professional Engineer qualified in the field of hydro-geotechnical survey to address the following:



- (a) Area ground water characteristics, including water sources on the site and overland surface drainage courses traversing across or influencing this property.
- (b) Site suitability for development; i.e., unstable soils, etc.
- (c) Drill and/or excavate test holes on the site and install piezometers if necessary. Log test hole data to identify soil characteristics, identify areas of fill if any. Identify unacceptable fill material, analyse soil sulphate content, identify unsuitable underlying soils such as peat, etc. and make recommendations for remediation if necessary.
- (d) List extraordinary requirements that may be required to accommodate construction of roads and underground utilities as well as building foundation designs.

11. Survey Monuments and Iron Pins

If any legal survey monuments or property iron pins are removed or disturbed during construction, the developer will be invoiced a flat sum of \$1,200.00 per incident to cover the cost of replacement and legal registration. Security bonding will not be released until restitution is made.

12. Bonding and Levy Summary

(a) Bonding

Water Main	\$120,000
Sanitary Main	\$55,000
Barnes Avenue Rd construction	\$85,000
Gordon Avenue raised median	\$40,000
Mission Springs Rd. Construction	\$378,000
Bonding	\$678,000.00
Existing Security in place for one half of Mission Spring Rd	
Z04-0013 Plan K3306 Lot CP	\$114,683 ( Def Rev )
DP03-0107 Plan 515 lot 9	\$ 69,000 (2004 Dollars)
Total Bonding Required	TBD

**NOTE:** The bonding amounts shown above are comprised of estimated construction costs escalated by 140% to include engineering design and contingency protection and are provided for information purposes only. The owner should engage a consulting civil engineer to provide detailed designs and obtain actual tendered construction costs if he wishes to do so. Bonding for required off-site construction must be provided as a condition of subdivision approval or building permit issuance, and may be in the form of cash or an irrevocable letter of credit, in an approved format.

The owner must also enter into a servicing agreement in a form provided by the City prior to 4<sup>th</sup> reading of the zone amending bylaw.



13. Site Related Issues

- (a) Our comments regarding the site related issues will be provided when a building permit application is made and site servicing drawings are submitted.
- (b) Access and Manoeuvrability
  - (i) The site plan should illustrate the ability of an SU-9 vehicle to manoeuvre onto and off-site without requiring a reverse movement onto public roadways. If the development plan intends to accommodate larger vehicles, the site plan should be modified and illustrated accordingly.
  - (ii) Gordon Drive driveway access will be restricted to a right in and right out only.
  - (iii) Site access and egress designs onto public roads must be submitted for approval by the City Works & Utilities Department. This is required to guarantee that the requirements and the limitations of access and egress required by the City have been addressed to the City's satisfaction.

14. Administration Charge

An administration charge will be assessed for processing of this application, review and approval of engineering designs and construction inspection. The administration charge is calculated as 3% of the total off-site construction costs, not including design. 12% HST will be added.

15. Transportation related Recommendations are as follows:

- (a) Raised center medians must be constructed on Gordon Drive at the Barnes Avenue intersection to regulate all turning movements. Design and construct raised concrete medians, 110 meters in each direction from the intersection. The cost for bonding purposes is **\$40,000.00**
- (b) If a gated entrance is proposed, the entrance area before the gate must allow for a vehicle (who has been denied gate access) to turn around and re-enter the public street in a forward direction. The area must allow for an "SU-9" vehicle turning radius and the gate must open into the site.

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Steve Muenz, P. Eng.  
Development Engineering Manager  
JF/jf



November 7, 2011

Tel: (604) 869-4945

File: 10270-5 006

Troika Developments Inc.  
Unit 114 - 1856 Ambrosi Road  
Kelowna, BC V1Y 4R9

**Attention: Mr. Bob Guy**

**Reference: Green Square Project, Kelowna BC  
Traffic Impact Study**

We are pleased to present our Traffic Impact Study for the above-mentioned project. This report is based on discussions with City of Kelowna Staff, and our work on previous traffic studies for similar projects in the Okanagan.

The Traffic Impact Study has been prepared to determine the effect the proposed residential development, and the anticipated community growth will have on adjacent roadways and City of Kelowna Infrastructure. This report addresses the off-site planning, traffic generation and distribution, traffic analysis, and recommendations for major street improvement requirements.

## **A) SITE CONTEXT**

The existing 4.1 ha site is zoned A-1, and is currently undeveloped. Current plans are based on the development of the northern half of the site for multifamily housing, with the southern portion of the site retained as a future municipal park.

As identified in **Figure 1**, a single family neighborhood is fully developed on the northern side of Barnes Avenue; a seniors assisted living complex is located to the east of the site, with a multifamily development to the south east of the site. The Casorso elementary school is on the west side of the site. On the south side of Casorso Road, there is a combination of single family housing, a senior's residential complex and a Church.



**Reference: Green Square Project, Kelowna BC  
Traffic Review**

On the northwest corner of the existing multifamily development there is a road dedication that has been established in anticipation of the proposed extension of Mission Springs Drive, from Casorso Road to Barnes Avenue. The new portion of Mission Springs Drive would run along the eastern side of the proposed Municipal Park and multifamily development site. Due to the establishment of the existing road dedication, the southern portion of the Mission Springs Drive right of way would be fully contained within the park lands, and the northern portion of the right of way would be split between the development site, and the road reserve located on the seniors assisted living site.



**Aerial View of Site (City of Kelowna Map Guide)**  
**Figure 1**



Reference: Green Square Project, Kelowna BC  
 Traffic Review

## B) BACKGROUND INFORMATION

The City of Kelowna provided a traffic count for Gordon Drive and Casorso Road, completed August 11, 2011.

CTQ has also completed additional one day traffic counts for the following intersections in July 2011

- Casorso Road And Mission Springs Road – July 22, 2011;
- Gordon Drive and Barnes Road, July 21, 2011.

The existing and future (2011, and 2021) traffic volumes were prepared based on the assessment of the traffic information listed above. The 2021 background traffic was increased an additional 28% to account for the anticipated 2.5% growth per year in the municipal traffic. The 2011 AM and PM Peak Hour background traffic actual volumes are presented in **Figure 2**, and the adjusted 2021 background PM Peak Hour traffic volumes are presented in **Figure 3**, below.

The above noted one day traffic count information is also presented in the **Appendix**.

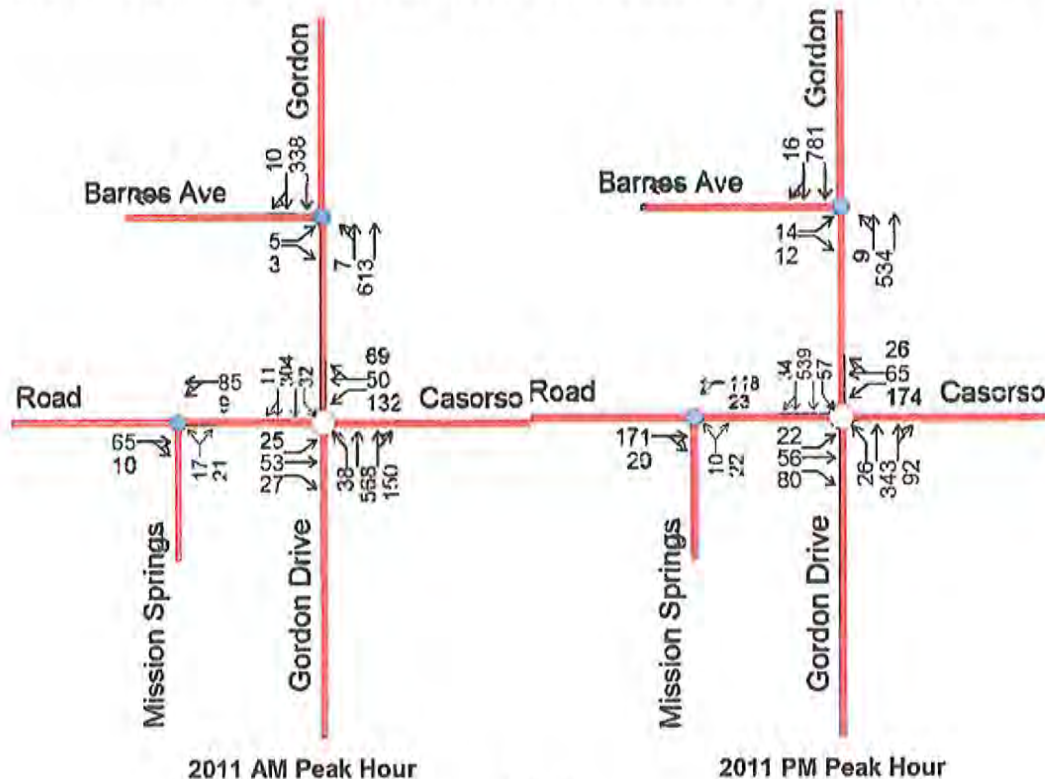


Figure 2







Reference: **Green Square Project, Kelowna BC  
Traffic Review**

## **C) TRAFFIC GENERATION and DISTRIBUTION**

### ***Development Traffic***

Traffic impact reviews are based on trip generation rates. The rates are based on information collated from actual traffic studies, and presented for the average weekday Peak Hour volumes the specific land use will generate, during normal operations. The trip generation rates applied for typical residential developments are from the Institute of Transportation Engineers Trip Generation Rates Manual, Volume 8, as follows:

- Mid Rise Apartments (ITE Code 223), with an AM rate of 0.35 trips per unit and PM rate of 0.42 trips per unit;
- Residential Condominium / Townhouse (ITE Code 230), with an AM rate of 0.44 trips per unit and PM rate of 0.52 trips per unit.

The proposed development consists of up to 169 units, made up of 122 apartment units and 47 Town House units.

Based on the above, the Site is anticipated to generate an average of 62 additional two-way vehicle trips during the AM Peak Hour (16 inbound / 46 outbound) and 77 additional two-way vehicle trips during the PM Peak Hour (47 inbound / 30 outbound).

For most developments, there are four types of trips generated by a development:

- Primary trips;
- Diverted link trips;
- Pass-by trips; and
- Internal trips.

Primary trips are trips completely devoted to the proposed development and only result because of the development. These are primarily home-based trips. Diverted link trips are made by vehicles already on the road network, but are diverting from their travel pattern to access the development. Pass-by trips are trips to the development that are caused by vehicles on the road network that pass by the development and decide to enter.

For both the pass-by trip and the diverted link trip, the vehicles are on the roadway for final destinations other than the proposed development. We have taken the conservative approach that all of the PM Peak Hour traffic is made up of home based trips.

The additional traffic generated from the proposed development is anticipated to have a similar distribution to the existing traffic patterns. The trip assignment of the inbound and outbound Weekday AM and PM Peak Hour trips resulting from the development were assigned to the road network for the study area, as presented in **Figure 4**, for the AM Peak Hour inbound and outbound trips; **Figure 5**, for the PM Peak Hour inbound and outbound trips; and **Figure 6**, for the AM and PM total Peak Hour development trips.

Reference: **Green Square Project, Kelowna BC  
Traffic Review**

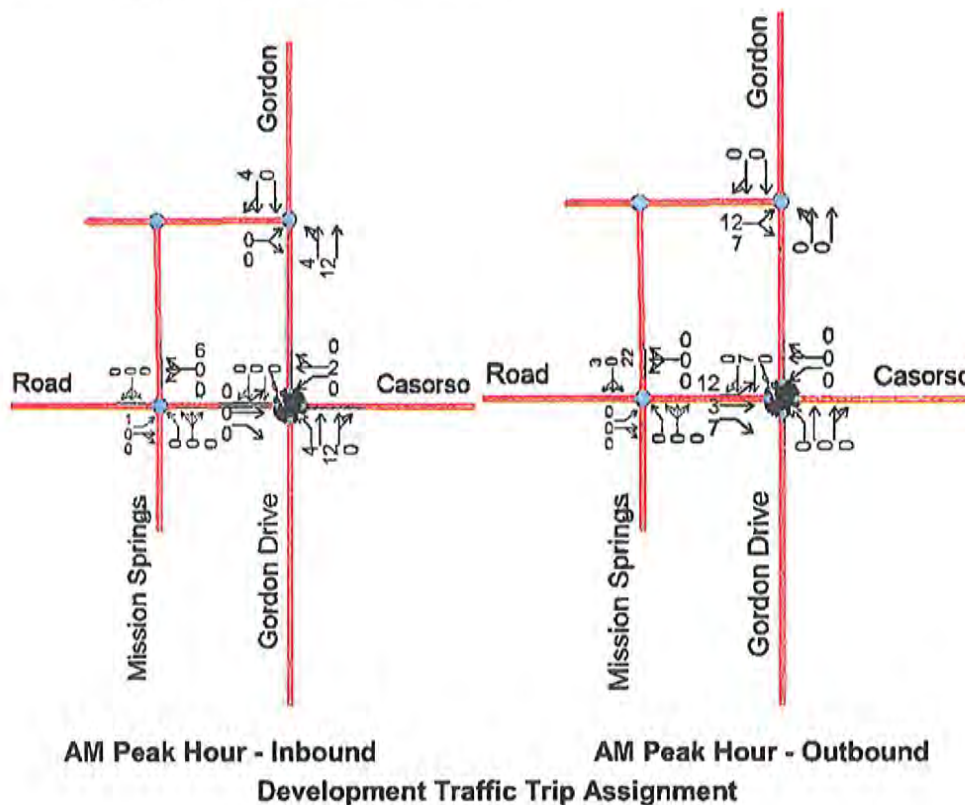


Figure 4



Reference: **Green Square Project, Kelowna BC  
Traffic Review**

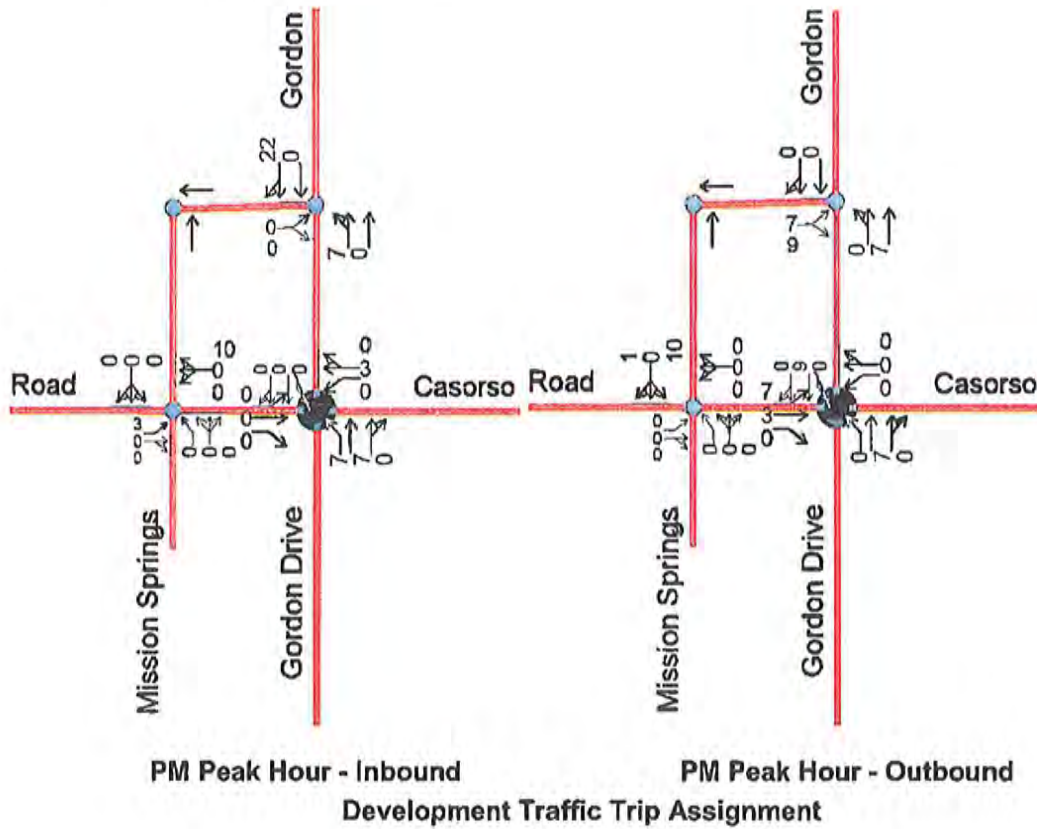


Figure 5

Reference: Green Square Project, Kelowna BC  
Traffic Review

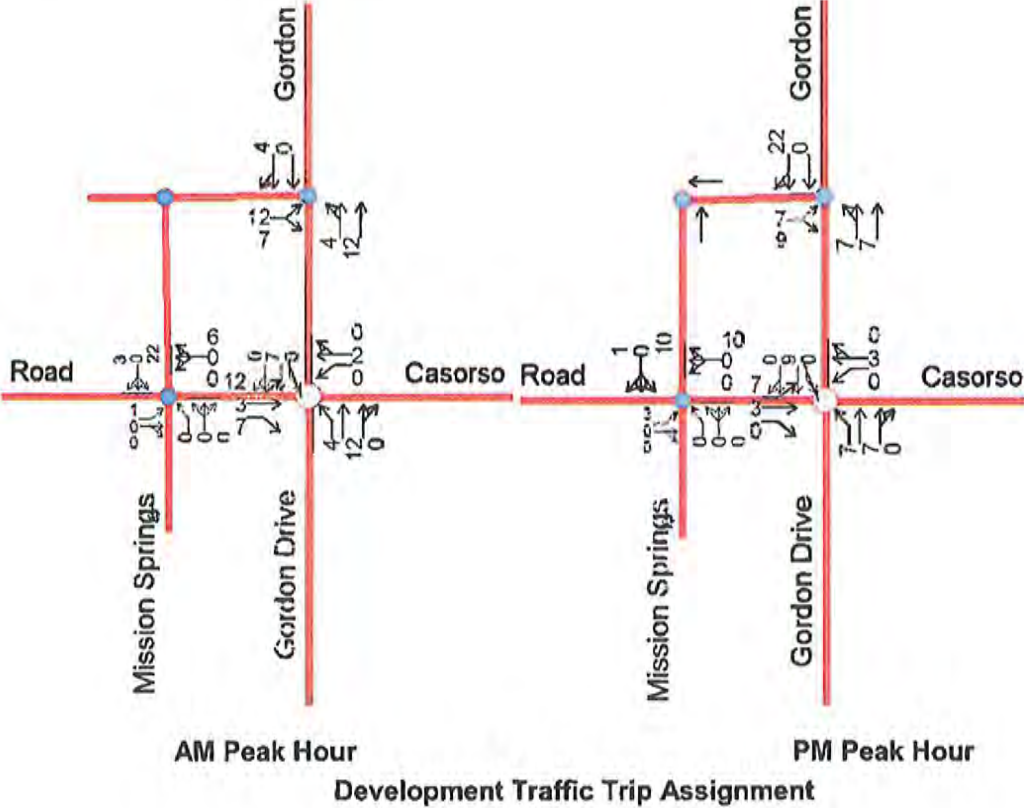


Figure 6



Reference: **Green Square Project, Kelowna BC  
Traffic Review**

## **D) TRAFFIC ANALYSIS**

The operations of the intersections have been analyzed utilizing Highway Capacity Manual Synchro 6 software for signalized and unsignalized intersections. An operational level of service is determined for each movement based upon the calculated delay.

The Levels of service for signalized intersections are as follows:

- Level of Service (LoS) A represents less than 10 seconds of average delay and is considered a good operating condition.
- Level of Service (LoS) B represents greater than 10 seconds and less than 20 seconds of average delay and is considered a good operating condition.
- Level of Service C represents greater than 20 seconds and less than 35 seconds of average delay and is considered a fair operating condition.
- Level of Service D represents greater than 35 seconds and less than 55 seconds of average delay and is considered a fair operating condition.
- Level of Service E represents greater than 55 seconds and less than 80 seconds of average delay and is considered a poor operating condition.
- Level of Service F represents more than 80 seconds of average delay and is considered a failed operating condition.

The Levels of service for unsignalized intersections are as follows:

- Level of Service (LoS) A represents less than 10 seconds of average delay and is considered a good operating condition.
- Level of Service (LoS) B represents greater than 10 seconds and less than 15 seconds of average delay and is considered a good operating condition.
- Level of Service C represents greater than 15 seconds and less than 25 seconds of average delay and is considered a fair operating condition.
- Level of Service D represents greater than 25 seconds and less than 35 seconds of average delay and is considered a fair operating condition.
- Level of Service E represents greater than 35 seconds and less than 50 seconds of average delay and is considered a poor operating condition.
- Level of Service F represents more than 50 seconds of average delay and is considered a failed operating condition.

Generally, and in accordance with the Ministry of Transportation Site Impact Analysis Requirements Manual, in urban areas, improvements are considered when the overall intersection performance nears Level of Service 'D' for Collector Road through traffic, and 'D' / 'E' for all other signalized and unsignalized movements. Volumes to Capacity Ratios are also reviewed. Acceptable v/c ratios of 0.85 and level of service D (based on delay) are acceptable for the overall intersection; v/c ratios of 0.90 are acceptable for individual movements.

**Reference: Green Square Project, Kelowna BC  
 Traffic Review**

95th percentile queues should be contained within available storage lengths for turning bays, with mitigation if the development traffic causes spill back of queues into the through lanes.

The background Weekday AM and PM Peak Hour traffic was analyzed for the 2011 and 2021 horizon years. The background plus full build out of the development was also analyzed for the Weekday PM Peak Hour traffic for the 2021 horizon year.

**Background Traffic Analysis**

Tables 1 and 2 present the results of the 2021 PM Peak Hour background traffic intersection analysis. The intersection Synchro analysis results are included in the Appendix.

**Table 1  
 2021 Background AM Peak Hour Intersection Performance**

	Control	Period	Critical V/C	Delay (Sec)	Overall LOS	Comment
Mission Springs and Casorso	Stop Sign	AM	0.06	2.1		
Barnes and Gordon	Stop Sign	AM	0.33	0.2		
Gordon and Casorso	Signal	AM	0.65	13.2	A	

**Table 2  
 2021 Background PM Peak Hour Intersection Performance**

	Control	Period	Critical V/C	Delay (Sec)	Overall LOS	Comment
Mission Springs and Casorso	Stop Sign	AM	0.16	1.5		
Barnes and Gordon	Stop Sign	AM	0.43	0.7		EB Left LoS 'E' 44 second delay
Gordon and Casorso	Signal	AM	0.65	14.3	A	



Reference: **Green Square Project, Kelowna BC  
 Traffic Review**

The background traffic analysis did not identify any current system deficiencies and/or operational constraints.

**Background plus Development Traffic Analysis**

Tables 3 and 4 presents the results of the 2021 PM Peak Hour background plus full build out of the development traffic intersection analysis. The intersection Synchro analysis results are included in **Appendix**.

**Table 3  
 2021 Background plus Development AM Peak Hour Intersection Performance**

	Control	Period	Critical V/C	Delay (Sec)	Overall LOS	Comment
Mission Springs and Casorso	Stop Sign	PM	0.07	2.7		
Barnes and Gordon	Stop Sign	AM	0.34	0.5		EB Left LoS 'C' 20 second delay
Gordon and Casorso	Signal	PM	0.66	13.3	B	

**Table 4  
 2021 Background plus Development PM Peak Hour Intersection Performance**

	Control	Period	Critical V/C	Delay (Sec)	Overall LOS	Comment
Mission Springs and Casorso	Stop Sign	PM	0.16	1.7		
Barnes and Gordon	Stop Sign	AM	0.43	1.1		EB Left LoS 'F' 51 second delay
			0.43	0.8		Addition of Raised Median on Gordon Drive EB Left LoS 'D' 32 second delay
Gordon and Casorso	Signal	PM	0.66	14.4	B	

**Reference: Green Square Project, Kelowna BC  
 Traffic Review**

The 2021 Background plus full build out of the development traffic analysis identified a level of service 'F' for the eastbound left turn from Barnes Avenue onto Gordon Drive. The addition of a raised median on Gordon Drive, improved the operation of the eastbound left to a level of service 'D', with a delay of 32 seconds. The raised concrete median on Gordon Drive would define the current painted left turn lane configuration for the portion of Gordon Drive adjacent to the Barnes Avenue intersection.

No other deficiencies and/or operational constraints resulted from the addition of the development traffic to the background traffic.

As an alternate the eastbound left from Barnes Avenue onto Gordon Drive could be restricted to only allow for operation between the hours of 7pm to 7am, as is the case on a number of minor street left turns onto Highway 97 in Kelowna. If the compliance with the restricted hours of operation is not satisfactory, the left turn could be closed and the exit restricted to a right out condition only. The restriction or closure of the left turn will direct traffic to the new Mission Springs Drive connection onto Casorso Road, or through the existing residential neighborhood to the north.

Table 5 presents the analysis of the adjacent intersections with the closure of the left turn and all traffic diverted to the Mission Springs Road and Casorso Road, and the Casorso Road and Gordon Drive intersections.

**Table 5  
 2021 Background plus Development PM Peak Hour Intersection Performance  
 (eastbound left from Barnes Ave onto Gordon Drive restricted)**

	<b>Control</b>	<b>Period</b>	<b>Critical V/C</b>	<b>Delay (Sec)</b>	<b>Overall LOS</b>	<b>Comment</b>
Mission Springs and Casorso	Stop Sign	PM	0.16	2.3		
Barnes and Gordon	Stop Sign	PM	0.43	0.4		EB Left restricted
Gordon and Casorso	Signal	PM	0.66	14.5	B	

With the left turn restricted, the combination of the development and background traffic analysis did not identify any system deficiencies and/or operational constraints.



November 7, 2011  
Mr. Bob Guy  
Troika Developments Inc.  
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**Reference: Green Square Project, Kelowna BC  
Traffic Review**

The City of Kelowna Traffic Branch would prefer to not restrict the left turn movements from Barnes Avenue on to Gordon Drive, and will monitor the intersection operation over time, prior to any modifications to the existing configuration being implemented.

The Barnes Avenue and Gordon Drive intersection was analyzed using the Transportation Association of Canada Canadian Traffic Signal Warrant Matrix Procedure (2005 edition). The results of the analysis are included in the appendix, and indicated a signal at the intersection was not warranted for the 2021 background plus development traffic.

### **E) RECOMMENDATIONS**

The projected growth in background traffic will increase the side street delay along the Gordon Drive corridor, but the overall the Casorso Road and Gordon Drive area will function within acceptable operational levels through to 2021.

The addition of the development traffic will place added pressure on the operation of left turn from Barnes Avenue onto Gordon Drive. The left turn could be either restricted in the hours of operation, or closed, without impacting the operational levels of the adjacent intersections.

We would be pleased to meet and discuss the findings presented above.

Sincerely,

**CTQ CONSULTANTS LTD.**

Per:



Mr. David D. Cullen, P.Eng.  
Transportation Engineer  
DDC:ddc