TRANSPORTATION PLANNERS AND ENGINEERS

bunt & associates

Corvette Landing:
669 Constance Avenue
Transportation Impact Assessment

Final Report

Prepared for

Standing Stone Developments Inc.

Date

January 31, 2018

Project No.

6230.01

bunt & associates

CORPORATE AUTHORIZATION

Prepared By: Simon Button, P.Eng.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA S. S. BUTTON # 46274

Jan 31, 2018

Bunt & Associates Engineering Ltd.
530 - 645 Fort Street
Victoria, BC V8W 1G2
Canada

Reviewed By: Tyler Thomson, MCIP RPP PTP
Transportation Planner

Telephone: +1 250 592 6122

Date: 2018-01-31
Project No. 6230.01
Status: Final

RECEIVED
JAN 31 2018
CORP. OF TOWNSHIP OF ESQUIMALT
DEVELOPMENT SERVICES

TABLE OF CONTENTS

EXHIBITS

TABLES

FIGURES

EXECUTIVE SUMMARY

Standing Stone Developments Inc. is proposing to redevelop the properties at 669 Constance Avenue as well as 658, 660 and 662 Admirals Road in Esquimalt, BC. The development is planning on providing up to 83 condos in a 12 storey building. The condos will range from studios to three bedrooms.

The development is located at the north end of Constance Avenue which is 200 metres from Esquimalt Village which is one of the four mixed-use commercial clusters identified in the Township of Esquimalt's Official Community Plan. The site is well serviced with transit, good cycling infrastructure and has a variety of commercial and service amenities within walking distance.

The development has shown initiative to encourage non-vehicle travel. The development will be providing at least one secure bicycle storage space per dwelling and is considering offering a parking space to a car-share provider.

The Esquimalt Parking Bylaw requires the proposed building to provide 1.3 vehicle parking spaces per multi-family dwelling unit for a total of 108 parking spaces for the proposed development. The development is planning on providing 1.0 parking space per dwelling unit which has been previously discussed with Township of Esquimalt staff. This is a reasonable parking supply given the large number of key destinations that can be reached from the development site by walking, cycling and transit.

The Esquimalt Parking Bylaw requires 25% of parking spaces be reserved for visitors and 75% be reserved for residents. Bunt recommends reserving 5 to 10% of the supplied parking spaces for visitors. This recommendation is consistent with survey results from the Metro Vancouver Apartment Parking Study and previous Bunt studies for similar developments in Greater Vancouver and Greater Victoria. This would result in the development providing 4 to 8 visitor parking spaces and 76 to 80 resident parking spaces for a total of 83 parking spaces.

The Admirals Road and Astle Street intersection currently operates within acceptable capacity thresholds during the PM peak hour. The intersection is forecasted to continue operating well for the 2029 horizon year including increases in background traffic and traffic generated by the proposed development.

The Admirals Road and Astle Street intersection currently has a large tree in the southwest corner which limits the sightlines of eastbound drivers which poses a safety risk. The tree should be trimmed to increase the sightlines of eastbound drivers.

1. INTRODUCTION

1.1 Study Scope and Objectives

Standing Stone Developments Inc. is proposing to redevelop the properties at 669 Constance Avenue as well as 658, 660 and 662 Admirals Road. The site is located at the north end of Constance Avenue in Esquimalt, BC and is shown in **Exhibit 1.1**.

The development is located approximately 200 metres north of the Esquimalt Village which is one of four commercial mixed-use clusters in Esquimalt. The properties are zoned multi-unit, high-rise residential (five or more stories). The development will have 83 condo units.

The purpose of this study is to:

- Review the development's parking strategy and determine its suitability;
- Evaluate the transportation impacts the proposed development has on the nearby road network; and,
- Evaluate the proposed site accesses.

1.2 Development Details

The development will have 83 residential rental units ranging from 350 square feet studios to approximately 1,000 square feet three bedroom homes. The majority of the condos will be relatively compact. The driveway to the underground parkade will be located on Constance Avenue (not Admirals Road).

The development aims to limit vehicle use and encourage residents to walk, cycle and use transit. The development will be providing at least one secure bicycle space per dwelling and potentially providing a bicycle maintenance stand with tools. The development is also considering offering a parking space to a car-share provider which will further improve alternative travel choices for the development. The development is also planning on providing electric car charging stations within the parkade.

S:\PROJECTS\SB\6230-01 699 Constance Ave TIA\5.0 Deliverables\20180129_699Constance_V04.cdr

Exhibit 1.1
Study Area

bunt & associates

2. LOCAL CONTEXT

2.1 Land Use

The site is located at the northern end of Constance Avenue which is approximately 200 metres north of Esquimalt Village. Esquimalt Village has a series of commercial buildings with variety of retail stores and restaurants, and other daily services. Increased densification has occurred in Esquimalt Village over the recent past with a number of ongoing development projects helping to make it a more compact, walkable environment.

2.2 Street Network

Constance Avenue is classified as a local street whereas the nearby Admirals Road and Esquimalt Road are classified as Major Roads. Since Constance Avenue terminates with a cul-de-sac immediately north of the proposed development site, it primarily serves local residents. Admirals Road and Esquimalt Road provide north/south and east/west connectivity across Esquimalt.

2.3 Walking and Cycling

The majority of nearby local streets do not have sidewalks on either side whereas the major roads (Admirals Road and Esquimalt Road) have sidewalks on both sides. Crosswalks are provided on all four legs of the two nearby major intersections (Admirals Road / Naden Way and Admirals Road / Esquimalt Road). Admirals Road has limited pedestrian crossing opportunities however Esquimalt Road has crosswalks every 100 to 200 metres in Esquimalt Village for increased pedestrian permeability.

Admirals Road has painted bike lanes in both directions in the vicinity of the development site. Esquimalt Road has painted bike lanes in both directions beginning 200 metres east of Admirals Road, continuing eastwards to the Johnson Street Bridge in the City of Victoria and westwards to approximately 3.5 kilometres to the east.

The site is approximately 600 metres from the E&N Regional Trail which currently extends from Esquimalt Road in the east to Songhees First Nation in the west, and from the north end of Songhees First Nations to the Old Island Highway.

2.4 Transit

BC Transit route 25 services the site with northbound and southbound stops on Admirals Road at the Naden Way intersection. Route 25 connects Esquimalt with Victoria-West and Downtown Victoria. Bus shelters are not provided either northbound or southbound bus stops at Naden Way.

Bus stops for BC Transit routes 15 and 26 are present at the Admirals Road and Esquimalt Road intersection, 300 metres south of the development site. Route 15 provides service to Victoria-West, Downtown Victoria and the University of Victoria whereas route 26 services Tillicum Mall, Uptown Mall and the University of Victoria.

3. DEVELOPMENT PLAN REVIEW

3.1 Vehicle Parking

The Esquimalt Parking Bylaw requires 1.3 parking spaces per dwelling unit in medium and high density buildings such as the one being proposed at 669 Constance Avenue. The Parking Bylaw also stipulates that 25% of the required parking spaces should be for visitors. Since the development is providing 83 dwellings the required parking supply is 108 parking spaces (81 for residents and 27 for visitors).

The development has discussed a parking variance the Township of Esquimalt to provide parking at a reduced rate of approximately 1.0 parking space per dwelling unit which results in a parking supply of 83 spaces. This is reasonable given:

- Smaller dwellings have lower vehicle ownership than larger dwellings[1]; and,
- The number of employment and retail opportunities within walking distance of the site and the proximity to cycling infrastructure and transit service make the site reasonably accessible even without an automobile.

The Parking Bylaw requires 25% of required parking spaces be reserved for visitors. Bunt recommends reserving 5 to 10% of the supplied parking spaces for visitors (4 to 8 visitor spaces). This recommendations stems from the *Metro Vancouver Residential Apartment Parking Study*[1] which found that visitor parking demand never exceeded 0.06 vehicles per dwelling unit during the study period. These rates have been further substantiated by previous Bunt studies for similar projects. The supply of 4 to 8 visitor spaces equates to 0.05 to 0.1 visitor spaces per dwelling unit. The recommend parking supply is therefore 4 to 8 spaces for visitors and 76 to 80 for residents. Therefore, the majority of the parking variance will be for visitor parking (4 to 8 provided versus 27 required) as the recommended resident parking supply (76 to 80) is similar to the Bylaw requirement (81).

The Parking Bylaw requires that one disabled persons' parking space be provided for every 50 required parking spaces or part thereof. Therefore, two of the parking spaces should be able to accommodate disabled persons' to comply with this requirement.

The Parking Bylaw allows a maximum of 50% of parking stalls to be designed for small cars. The latest parkade design has 60% of the parking stalls designed for small cars. Parking stalls in condo buildings are

[1] The visitor parking demand results from the Metro Vancouver Residential Parking Study was obtained from suburban sites in Burnaby, Port Coquitlam and Richmond which had varying levels of transit service. The visitor parking demand was not correlated with proximity to the Frequent Transit Network; in fact the site with the worst transit service had the lowest peak visitor parking demand of 0.02 visitor vehicles per dwelling. Therefore the results from the Metro Vancouver Residential Parking Study are seen as applicable to the proposed development at 699 Constance Avenue.

typically assigned to a specific dwelling. Due to the high ratio of small car stalls, parking stalls should be assigned to residents based on their vehicle size such that residents with larger vehicles are assigned larger parking stalls.

3.2 Bicycle Parking

The Parking Bylaw does not have any requirements for bicycle parking for multi-family dwellings. However, the development is planning on providing secure bicycle parking in the parkade and potentially providing a bicycle maintenance stand with tools. Bunt recommends that at least 1.0 secure bicycle parking stall is provided per dwelling. The latest development plan includes 125 secure bicycle parking stalls (1.5 stalls per dwelling) which well exceeds Bunt's recommended supply rate. Bunt also recommends that bicycle racks for visitors be installed near building entries.

3.3 Access

Vehicle and bicycle access to the underground parkade will be located on Constance Avenue. Bunt recommends that pedestrian entrances to the building be located on Constance Avenue and Admirals Road to improve the pedestrian accessibility of the building.

3.4 Parkade Design

Due to the site's unique shape, the architect has designed the parkade using City of Vancouver standard dimensions as opposed to Township of Esquimalt standard dimensions. Due to the seismic resistance requirements of the timber-based structural system, a minimum amount of vertical continuity from the homes above through the concrete parking structure to the bedrock is required, which constrains the available width for parking stalls.

A comparison of multiple municipalities' parkade dimension requirements are shown in **Table 3.1**. Two sets of dimensions are shown for Esquimalt as the drive aisle width varies with parking stall dimension. The Vancouver dimensions are slightly smaller than the Esquimalt dimensions which allow for a more compact parkade and more useable space within the irregular shaped property lines and unique structural system. Although the Vancouver dimensions are smaller, they are used on a consistent basis on Vancouver based projects without issues. Compared to the Esquimalt (1) dimensions, Victoria allows drive aisles to be 0.6 m narrower and parking stalls 0.4 m shorter. Bunt recommends that the Township of Esquimalt accept the architect's parkade design based on the Vancouver dimensions.

Table 3.1: Municipal Parkade Design Requirements

DIMENSION	ESQUIMALT (1)	ESQUIMALT (2)	VANCOUVER	VICTORIA
Drive Aisle	7.6 m	7.9 m	6.6 m	7.0 m
Regular Parking Stall	5.5 m x 2.6 m	N/A	5.5 m x 2.5 m	5.1 m x 2.6 m
Small Car Parking Stall	N/A	4.5 m x 2.4 m	4.6 m x 2.3 m	N/A

Section 14(4) of the Esquimalt Parking Bylaw states that any parking stall which abuts a fence or structure must by widened by 0.3 m above the minimum requirements. The drawings provided by the architect on

January 29th, 2018 have 24 instances where this requirement is not met. Many of these parking stalls are offset by at least 0.2 m from adjacent structural walls. There are more structural walls in the parkade than usual due the building's unique timber-based structural system.

Bunt reviewed the parkade drawings dated January 29, 2018 for accessibility and safety. As the parkade is based on Vancouver's standard dimensions it should be accessible to the majority of vehicles. Bunt conducted an AutoTURN swept-path analysis to review the accessibility of the parkade. Swept paths for some of the most restrictive maneuvers are shown in **Exhibits 3.1** to **3.4**. The swept-paths indicate that vehicles have sufficient space to maneuver in the parkade. The design vehicle for the majority of the analysis was a passenger vehicle 5.5 metres long and 2.1 metres wide (for comparison, 85% of vehicles in North America are less than 5.0 metres long and 1.85 metres wide[2]). A Volkswagen Beetle was used to test the small car parking stall.

One potential safety issue is the lack of visibility between drivers driving down the ramp (to all three levels) and a driver exiting the parking stalls at the bottom of the ramp. This conflict is shown in **Figure 3.1** for the P1 level however it exists on all three parkade levels. In order to mitigate this issue, Bunt recommends that the first two stalls at the bottom of the ramp on P1 (and first three stalls on P2 and P3) be marked as "reverse-in only" such that drivers have better visibility exiting the stalls. Furthermore, a convex mirror should be installed in the location identified using a blue circle in Figure 3.1.

[2] Parking Facility Planning and Design Guidelines, Canadian Parking Association, 2006.

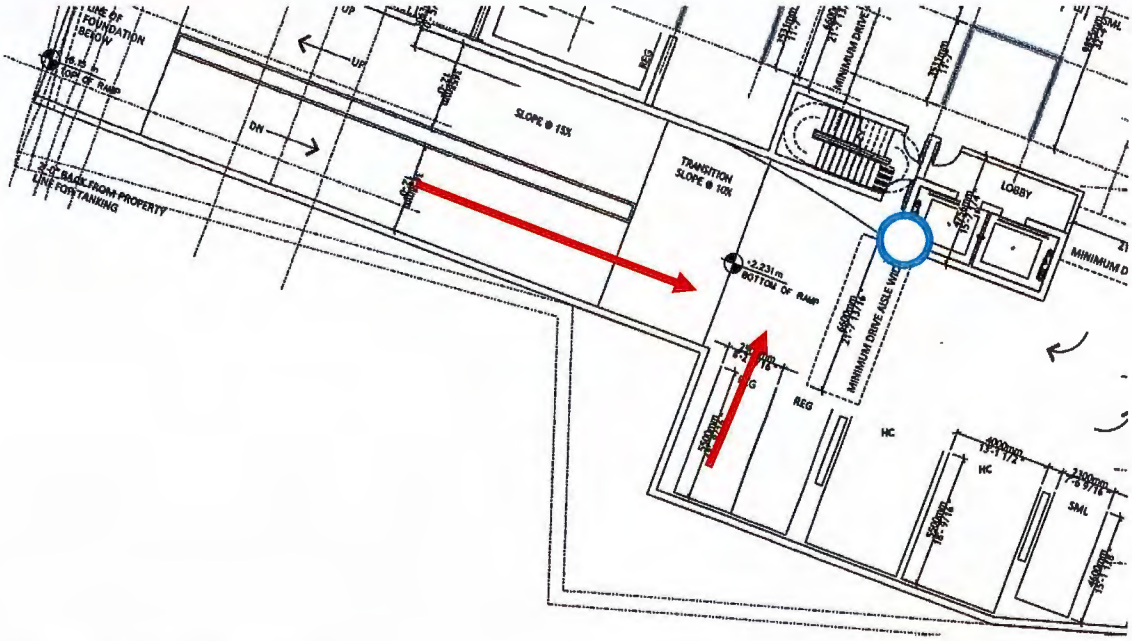


Figure 3.1: Parkade Visibility

Source: Lang Wilson Practice in Architecture Culture

3.5 On-Street Parking / Street Improvements

There is on-street parking on the majority of Constance Avenue's west side, north of Esquimalt Road. As shown in **Figure 3.2**, the street width narrows as it approaches the project site at the north end of the street.

The area highlighted in blue in Figure 3.2 presents an opportunity to improve the on-street parking by widening the street. Widening the street will make the parking spaces more accessible due to the dead-end just north of the development site.

Figure 3.2: On-street Parking Opportunities

Base map source: Capital Regional District

S:\PROJECTS\SB\6230-01 699 Constance Ave TIA\4.0 Analysis & Design\20180130_6230-01_AT_V01.dwg
2018/01/31 09:02, Plotted by Simon Button

RECEIVED
JAN 31 2018
CORP. OF TOWNSHIP OF ESQUIMALT
DEVELOPMENT SERVICES

Exhibit 3.1

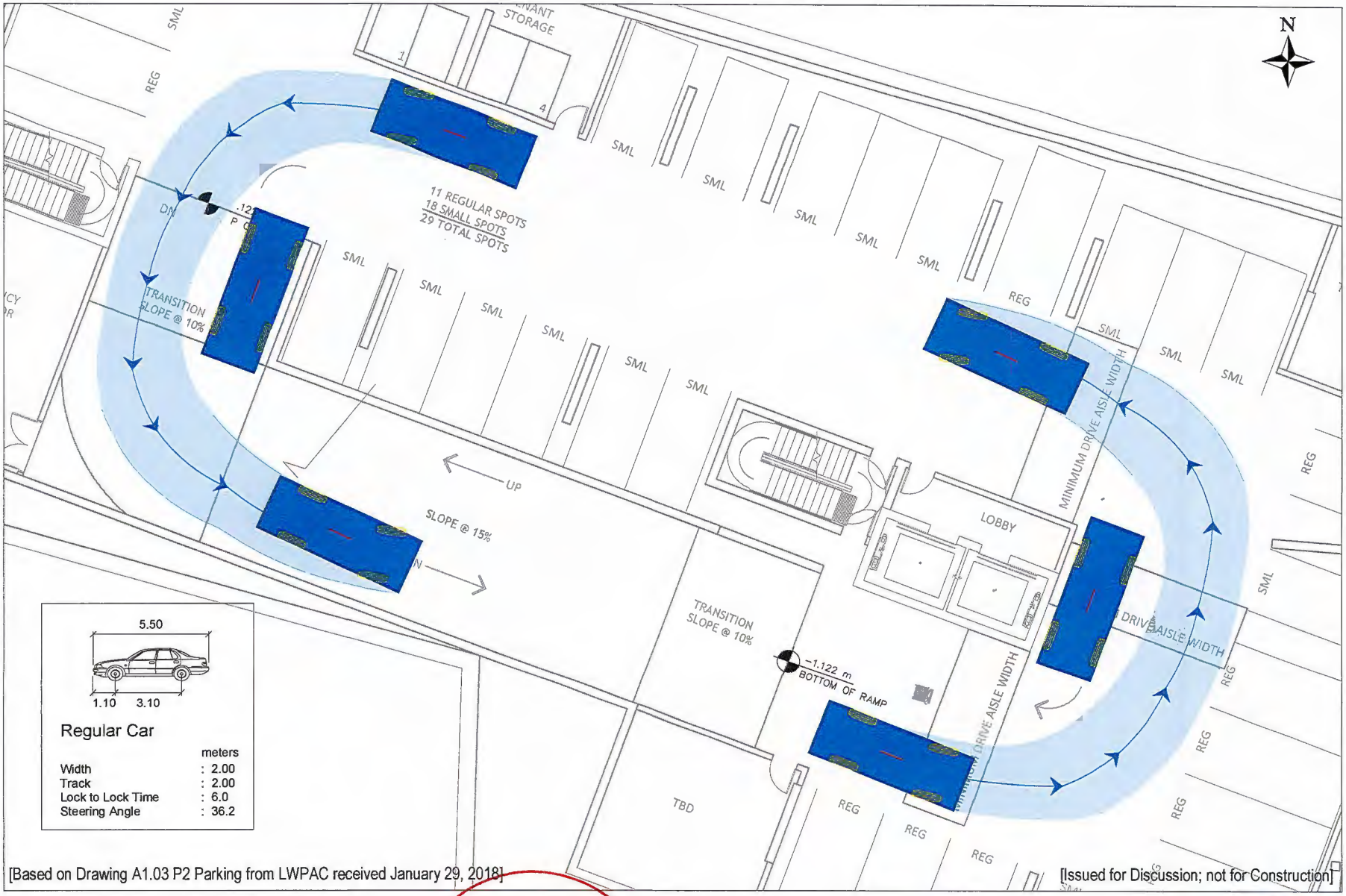
P1 Parking Movements

669 Constance Ave TIA

6230.01 January 2018 Scale Custom on Letter Prepared by HS

bunt & associates

S:\PROJECTS\SB\6230-01 699 Constance Ave TIA\4.0 Analysis & Design\20180130_6230-01_AT_V01.dwg
2018/01/31 09:02, Plotted by Simon Button



RECEIVED
JAN 31 2018
CORP. OF TOWNSHIP OF ESQUIMALT
DEVELOPMENT SERVICES

Exhibit 3.2

P2 Vehicle Movements

6230.01 January 2018 669 Constance Ave TIA
Scale Custom on Letter Prepared by HS

bunt & associates

S:\PROJECTS\SB\6230-01 699 Constance Ave TIA\4.0 Analysis & Design\20180130_6230-01_AT_V01.dwg
2018/01/31 09:02, Plotted by Simon Button

[Based on Drawing A1.02 P3 Parking from LWPAC received January 29, 2018]

[Issued for Discussion; not for Construction]

RECEIVED
JAN 31 2018
CORP. OF TOWNSHIP OF ESQUIMALT
DEVELOPMENT SERVICES

Exhibit 3.3

P3 Small Car Parking Movement

669 Constance Ave TIA
6230.01 January 2018 Scale Custom on Letter Prepared by HS

bunt & associates

S:\PROJECTS\SB\6230-01 699 Constance Ave TIA\4.0 Analysis & Design\20180130_6230-01_AT_V01.dwg
2018/01/31 09:02, Plotted by Simon Button

[Based on Drawing A1.02 P3 Parking from LWPAC received January 29, 2018]

[Issued for Discussion; not for Construction]

RECEIVED
JAN 31 2018
CORP. OF TOWNSHIP OF ESQUIMALT
DEVELOPMENT SERVICES

Exhibit 3.4

P3 Regular Car Parking Movement

669 Constance Ave TIA
6230.01 January 2018 Scale Custom on Letter Prepared by HS

bunt & associates

4. TRAFFIC AND SAFETY REVIEW

4.1 Traffic Operations Assessment Methodology

The traffic operations were assessed at the Admirals Road / Astle Street intersection for the PM peak hour. The analysis was completed for the existing conditions (2017) and for the 2029 horizon year (ten years after development completion). The 2029 analysis includes the vehicle trips generated by the proposed development and background traffic (i.e. existing traffic plus growth on the network).

The operation of study intersection was assessed using the methods outlined in the 2000 Highway Capacity Manual (HCM), using the Synchro 9 analysis software. The traffic operations were assessed using the performance measures of Level of Service (LOS) and volume-to-capacity (V/C) ratio.

The LOS rating is based on average vehicle delay and ranges from "A" to "F" based on the quality of operation at the intersection. LOS "A" represents minimal queuing time conditions while a LOS "F" represents an over-capacity condition with considerable congestion and/or queuing time. A queuing time of less than 10 seconds receive an LOS A whereas queuing times greater than 50 seconds receive and LOS F. In downtown and Town Centre contexts, during peak demand periods, queuing times greater than 50 seconds (LOS F) are common.

The volume to capacity (V/C) ratio of an intersection represents the ratio between the demand volume and the available capacity. A V/C ratio less than 0.85 indicates that there is sufficient capacity to accommodate demands and generally represents reasonable traffic conditions in suburban settings. A V/C value between 0.85 and 0.95 indicates an intersection is approaching practical capacity; a V/C ratio over 0.95 indicates that traffic demands are close to exceeding the available capacity, resulting in saturated conditions. A V/C ratio over 1.0 indicates a congested intersection where drivers may have to wait through multiple signal cycles. In urban downtown and town centre contexts, during peak demand periods, V/C ratios over 0.90 and even 1.0 are common.

4.2 Existing Conditions

Bunt conducted a traffic count at the Admirals Road / Astle Street intersection on Tuesday July 11th from 3:00 to 4:30 PM. During this time period, 3:15PM to 4:15PM was identified as the peak hour.

Bunt observed approximately 950 to 1,000 vehicles on Admirals Road during the weekday PM peak hour with approximately half of the vehicles travelling to the north and half to the south. Minimal vehicles were observed turning to/from Astle Street at the intersection.

As shown in **Exhibit 4.1**, there are no traffic operations concerns with the existing conditions. All movements operate within their capacity and have reasonable queuing times.

4.3 Future Conditions

4.3.1 Background Traffic

Background traffic is the traffic that would exist without the proposed development and taking into account any increase in traffic due to other developments in the area that would add to the road network. Background traffic was estimated by combining the existing traffic data at the Admirals Road / Astle Street intersection with historical traffic data near the site. Historical traffic data on Admirals Road north of Esquimalt Road (approximately 200 metres south of Astle Street) was obtained from the Capital Regional District. Daily vehicle volumes increased from 11,270 to 12,470 between 2014 and 2016. This represents an increase of approximately 5% more vehicles per year. This is a notably high yearly increase which cannot be sustained for a considerable amount of time. This may be due to the relatively short period of time (two years) between to the two data collection dates.

A 2% yearly increase in background traffic on Admirals Road was assumed for this study which is typical in suburban areas. This is a more realistic growth pattern that can be sustained over twelve years and is still higher than many similar streets in the region.

4.3.2 Development Generated Traffic

The Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition) was used to estimate the number of vehicle trips generated from the proposed building. The vehicle trips rates as per the ITE Trip Generation Manual and the resulting trip generation are presented in **Table 4.1**.

Table 4.1: PM Peak Hour Vehicle Trip Generation

LAND USE				TRIP RATES			TRIP GENERATION		
ITE LAND USE CODE	TITLE	SIZE	VARIABLE	IN	OUT	TOTAL	IN	OUT	TOTAL
222	High-rise Apartment	83	Units	61%	39%	0.36	18	12	30

As shown in Table 4.1, the ITE trip rate results in approximately 30 vehicle trips (18 in and 12 out) during a typical PM peak hour period which is equivalent to approximately one vehicle every two minutes. The ITE trip rates are typically obtained from suburban locations with almost all travel completed by vehicle. It is anticipated that a number of residents and visitors of the proposed development will walk, bike and use transit. Thus the trip volumes shown in Table 4.1 are likely an overestimation of the actual vehicle trips generated by the proposed development.

The new vehicle trips were assigned travel directions based on the existing travel patterns. The assumed travel pattern for traffic in and out of the proposed development is shown in **Exhibit 4.2**.

4.3.3 Traffic Operations Results

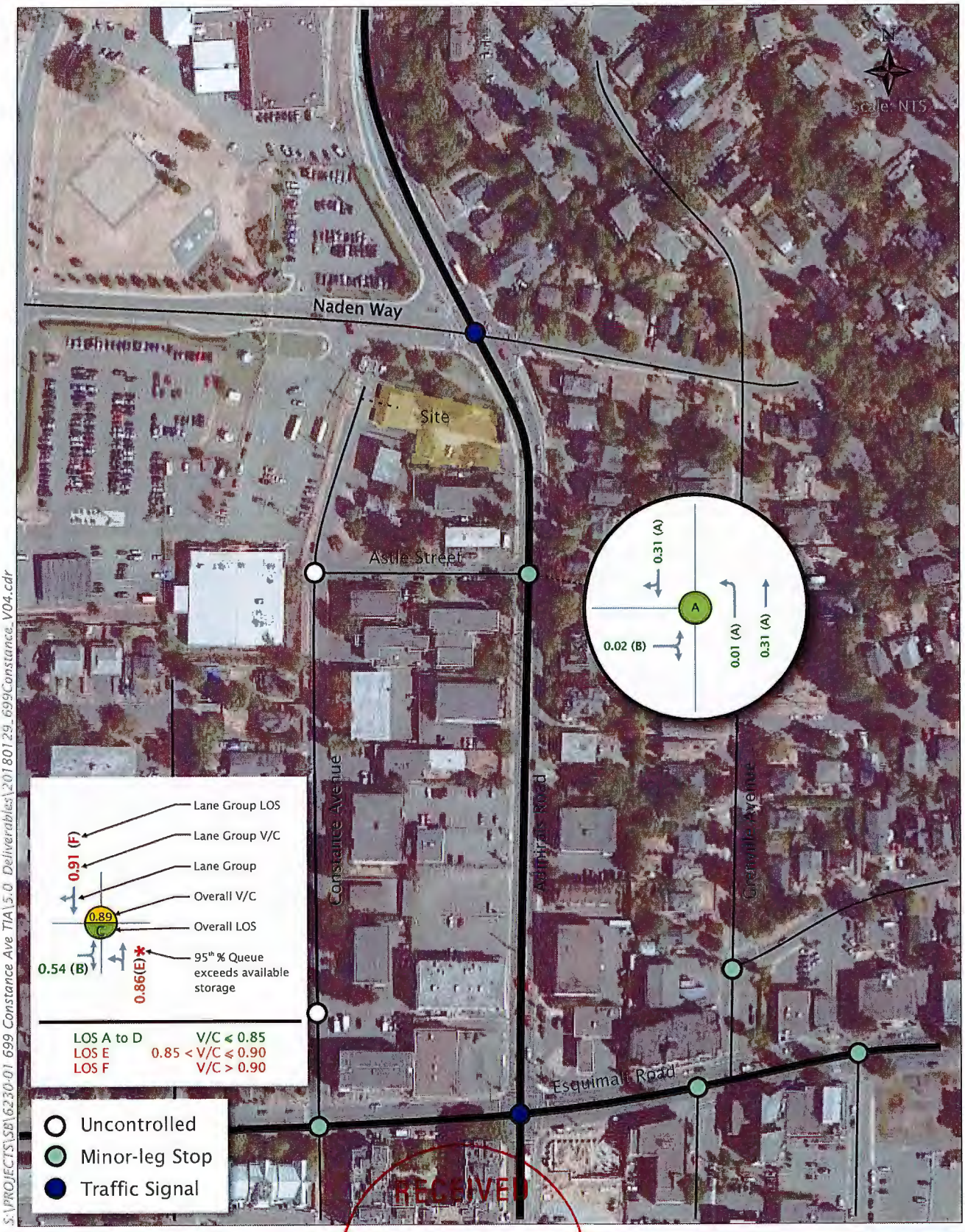
Exhibit 4.3 demonstrates the traffic operation results for the year 2029 with growth in background traffic and the traffic generated by the proposed development. As Exhibit 4.3 demonstrates, there are no traffic operational concerns at the Admirals Road / Astle Street intersection with all movements operating within their capacity. The queuing time for the eastbound approach is approximately 16 seconds (LOS C) which is considered reasonable. The eastbound queue should rarely exceed one vehicle.

4.4 Safety Review

There is a large tree in the southwest corner of the Admirals Road / Astle Street intersection (see **Figure 4.1**). The tree limits the visibility of eastbound drivers looking for northbound vehicles. Eastbound vehicles can only see northbound vehicles when they are within approximately 25 to 30 metres of the stopped vehicle. The Geometric Design Guide for Canadian Roads (TAC, 2017) recommends providing 105 metres of intersection sight distance in this scenario, assuming vehicles on Admirals Road are travelling at 50 km/h.

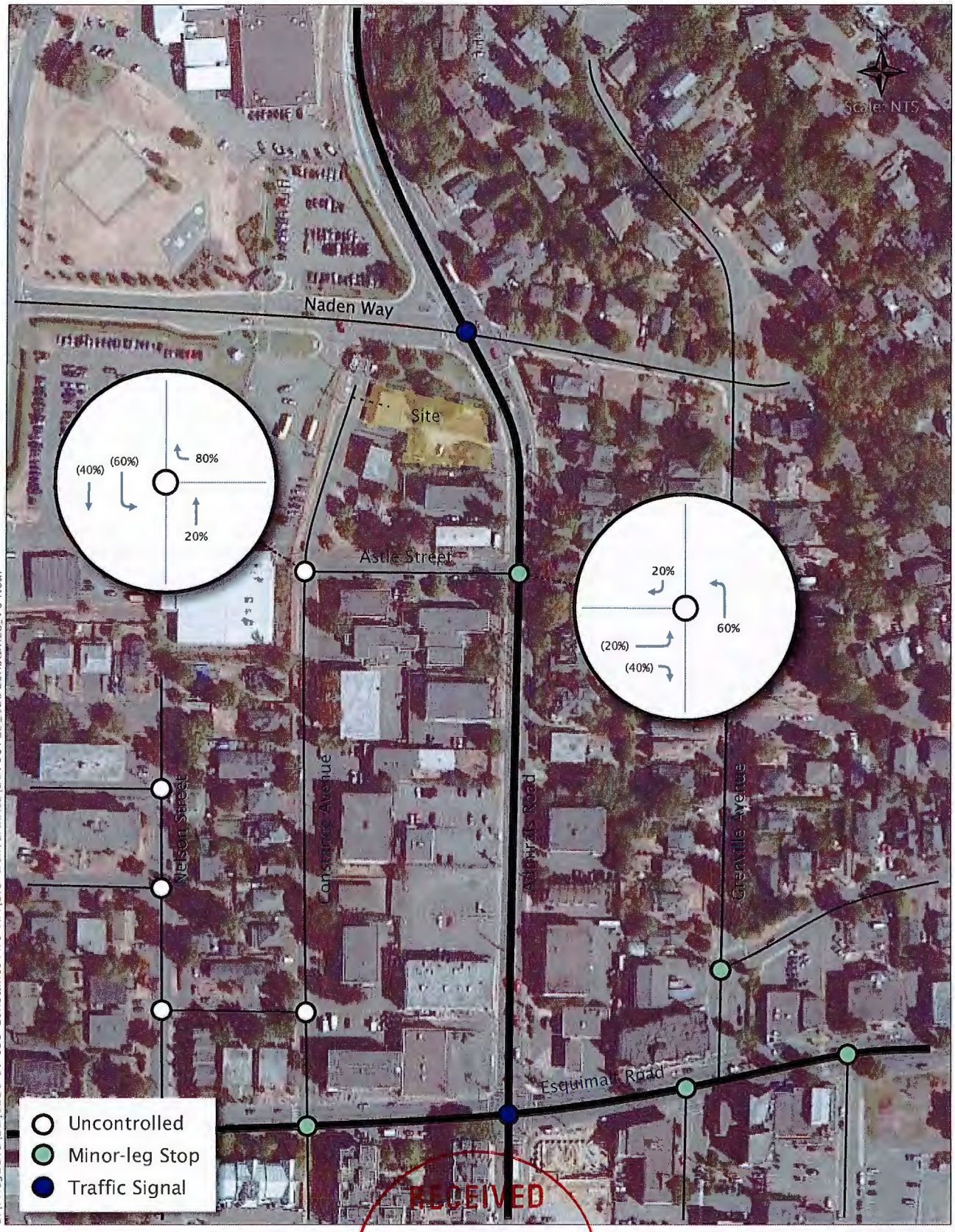
Figure 4.1: Vegetation Obstructing Visibility at the Admirals Road / Astle Street intersection

The tree should be trimmed to allow for greater visibility. The tree should be maintained as per Article 24 of the Esquimalt Zoning Bylaw which limits visual obstructions within 6 metres of street corners.



S:\PROJECTS\SB\6230-01 699 Constance Ave TIA\5.0 Deliverables\20180129_699Constance_V04.cdr

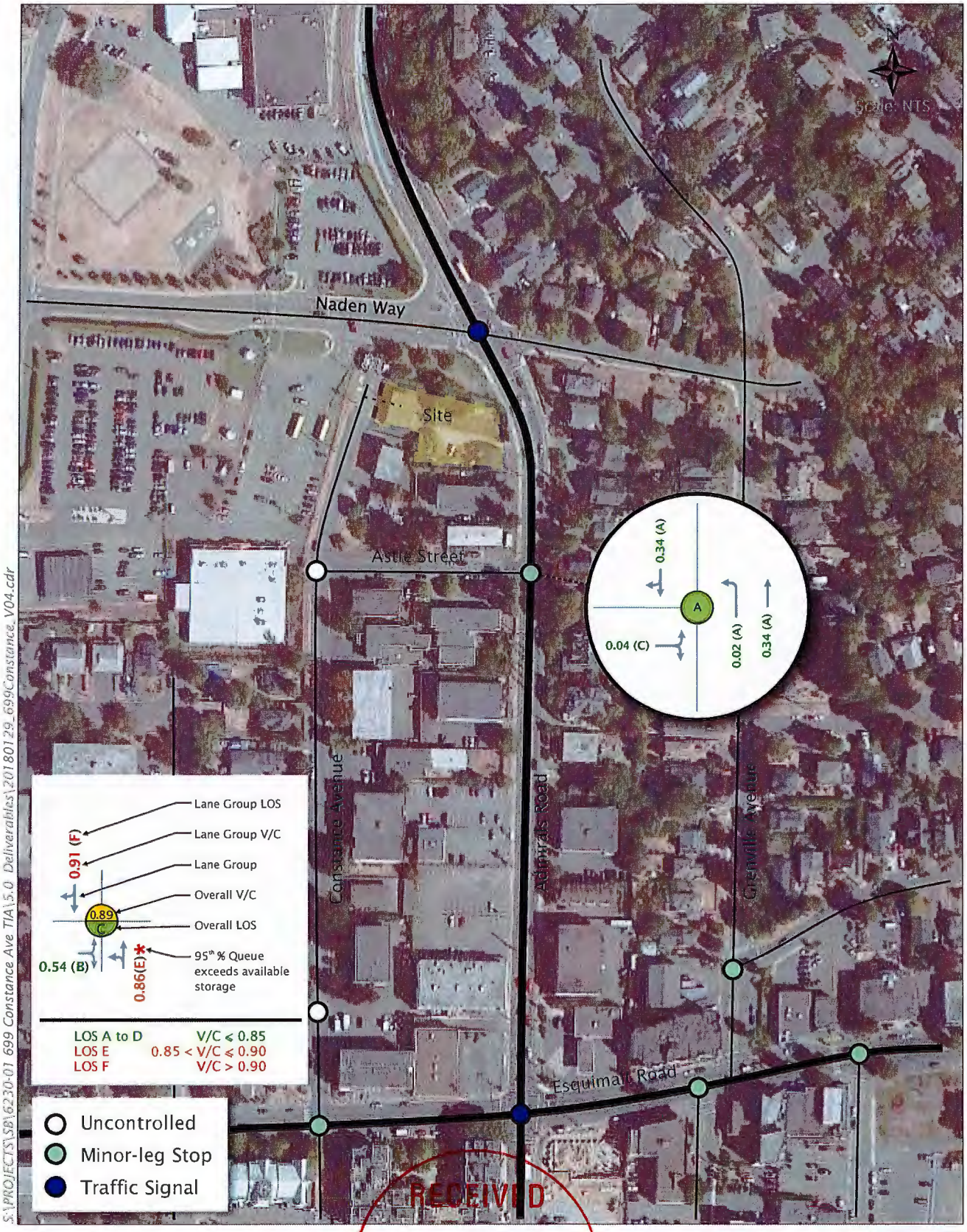
Exhibit 4.1
Existing Traffic Operations
PM Peak Hour



S:\PROJECTS\SB\6230-01 699 Constance Ave TIA\5.0 Deliverables\20180129_699Constance_V04.cdr

Exhibit 4.2
Traffic Distribution
PM Peak Hour

bunt & associates



S:\PROJECTS\SB\6230-01 699 Constance Ave TIA\5.0 Deliverables\20180129_699Constance_V04.cdr

Exhibit 4.3
2029 Total Traffic Operations
PM Peak Hour

bunt & associates

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

- The proposed new residential development at 669 Constance Avenue will have a maximum of 83 condo units. The dwellings will range from studios to three bedroom condos.
- The site is well serviced with transit and is within walking range to a wide variety of commercial and service amenities.
- The Parking Bylaw requires 1.3 parking spaces at the development property. This equates to 108 parking spaces for 83 dwellings; 81 for residents and 27 for visitors.
- The development plans on providing parking at a reduced rate of approximately 1.0 parking space per dwelling unit for a total of 83 parking spaces. This parking supply rate has been discussed with Township of Esquimalt staff.
- The site is expected to generate approximately 30 total vehicle trips per weekday PM peak hour. This is considered to be a nominal amount of traffic considering Admirals Road currently has approximately 1,000 vehicles during the PM peak hour.
- The Admirals Road / Astle Street intersection currently operates within capacity and is forecasted to continue operating within capacity with the proposed development.
- The Admirals Road / Astle Street intersection has a large tree in the southwest corner which is restricting sightlines between eastbound and northbound vehicles.

5.2 Recommendations

- 1.0 parking space per dwelling should be provided of which 5 to 10% should be reserved for visitors. This results in a recommended parking supply of 4 to 8 spaces for visitors and 76 to 80 for residents for a total of 83 spaces.
- The tree in the southwest corner of the Admirals Road / Astle Street intersection should be trimmed. The tree should be maintained as per Article 24 of the Esquimalt Zoning Bylaw which limits visual obstructions within 6 metres of street corners.
- The development should have pedestrian access from Constance Avenue and Admirals Road.
- Short-term bicycle parking should be provided near building entrances.
- Vehicle parking spaces at the bottom of the three ramps should be labeled "reverse-in only" and convex mirrors should be installed to improve visibility between drivers.