COUNCIL AGENDA/INFORMATION		
☐ Closed	Date:	Item # 6.
☑ Reg. Council	Date: OCT. 7, 2013	Item #
☐ Supplemental	Date:	Item #

Director	CAO

6.

DISTRICT OF WEST VANCOUVER
750 – 17TH STREET, WEST VANCOUVER, BC V7V 3T3

COUNCIL REPORT

Attachments for item 6. provided under separate cover

Date: September 12, 2013 File: 1010-20-12-084

From: Lisa Berg, Senior Community Planner

Subject: **Official Community Plan Amendment, Rezoning and Development Permit No. 12-084 for 825 Taylor Way and 707 Keith Road (Maison Seniors' Living)**

RECOMMENDED THAT:

1. Official Community Plan Amendment, Rezoning and Development Permit application No. 1010-20-12-084 for 825 Taylor Way and 707 Keith Road known as the Maison Seniors' Living project advance in the application review process;
2. Staff bring forward proposed bylaws to amend the Official Community Plan and Zoning Bylaws, and a proposed Development Permit for Council consideration, subject to preliminary development plans for 825 Taylor Way and 707 Keith Road (proposed 'Maison Seniors' Living') being further detailed, specifically:
    a. to provide more neighbourhood contextual information (for re-submission to the Design Review Committee);
    b. to be more responsive to context and materials;
    c. by blending the buildings with a cohesive architecture with more variety to the massing and materiality;
    d. to increase the amount of useable open space;
    e. by re-examining tree retention with invasive species in mind;
    f. by providing a more specific sustainability approach;
    g. by considering screening to create boundaries without a linear fence; and
    h. by looking at ways to mitigate light pollution to neighbouring residents.

Document # 668204v1

Purpose

This report deals with an application for an Official Community Plan (OCP) amendment, Rezoning and a Development Permit for 825 Taylor Way and 707 Keith Road (see Appendix A – Context Map). The development proposal is for a seniors' assisted living and memory care residence consisting of 110 beds. On April 8, 2013 Council directed staff to consult with the community on the development proposal. The purpose of this report is to advise Council on:

- the outcome of the Community Consultation meeting held on May 28, 2013;
- the recommendations of the Design Review Committee meeting held on July 25, 2013; and
- the suitability of the development proposal for further consideration.

1.0 Background

1.1 Prior Resolutions

April 8, 2013 – Council directed that community consultation on Official Community Plan Amendment, Rezoning and Development Permit Application No. 12-084 for 825 Taylor Way and 707 Keith Road take the form of Design Review Committee consideration and a public meeting in May 2013; and that staff report back on the results of this consultation, and provide a complete review of the development proposal and recommended next steps.

2.0 Policy

2.1 Official Community Plan

Redevelopment of this site is guided by OCP Policy H3 and H10.

Policy H3 recognizes that opportunities occur in limited site-specific situations where a housing need may be addressed in a manner that is consistent with the Principles of the OCP. This policy specifies that applications for such site-specific zoning or OCP amendments within a single family area should apply in limited circumstances and be subject to Council's Public Involvement Policy and defined criteria; namely that development would have minimal impact on established areas in terms of access, traffic, parking and obstruction of views and the site would provide a degree of physical separation (e.g. a road, green belt, alternate use, or change in natural grade) from the surrounding neighbourhood.

Policy H10 provides further direction for the review of this development application; specifically where a proposal is for seniors' housing.

This proposal is evaluated against Policies H3 and H10 in Section 4.1 of this report.

2.2 Bylaw

The site consists of two properties: 707 Keith Road and 825 Taylor Way, and has an area of 6,434.5 square metres. The site is currently zoned RS3 (Single Family Residential Zone 3), which establishes a minimum lot size of 1,115 square metres. The subject site could be developed with five single family lots under existing zoning.

3.0 Analysis

3.1 Discussion

The Site

The site is bounded by Taylor Way to the east, Keith Road to the south with the Evelyn by Onni development beyond, and single family residential to the north and west. The site is 6,434.5 square metres (1.6 acres) in area, with access from Keith Road and Taylor Way. It has a north to south slope of approximately 15%. Stands of mature coniferous trees are located throughout the site and the southeast property line facing Taylor Way features a large boulevard evergreen hedge.

A vacant single family house currently occupies each property. Neither of the houses are considered to have architectural merit or heritage value.

The Proposal

The proposal is for a private-pay seniors' assisted living and memory care residence of 110 beds. No independent living units are proposed. Key features of the proposal include:

- A Floor Area Ratio (FAR) of 1.1.
- A single building consisting of: a 2-storey resident amenity, and dining wing and a 3-storey attached residence wing consisting of 110 beds within 93 bedrooms.
- 40 parking spaces (32 enclosed spaces within an underground parkade and 8 surface spaces).

Proposed resident amenities are to include: common and private dining rooms, a theatre, a lounge and living room each with fireplaces, library, games space and meeting area and a bistro. A significant design feature of the resident amenity building is a spacious south-facing ground-level patio adjacent to a large common area with a grand winding staircase and elevator access to common areas on the next level. Support areas are also contained within this building, including a primary kitchen, food service areas, staff offices and laundry.

The residence building features three levels of living, with secure memory bedrooms on the first level. This specialized living area contains 36 bedrooms, a separate dining and activity area and an internal courtyard. Other features include: unique memory care therapy rooms, a wellness centre, bathing room, and access to secure outdoor space to prevent resident wandering.

Levels two and three of the residence building contain 74 bedrooms (37 bedrooms on each floor). Each floor has activity and library areas, lounge space, a wellness centre and bathing room, and access to large south facing decks. Seniors on these floors will dine in the bistro or common dining room, use the private dining room for family gatherings, watch a movie, sit by one of two fireplaces and generally gather and interact with other residents on these levels.

See Appendix B for the complete project profile.

Official Community Plan H3

The following table evaluates the proposal against the criteria set out in OCP Policy H3:

	H3 Criteria	Evaluation
1a	Minimal impact on established areas in terms of access	• Single driveway access from Keith Road. • Closure of access from Taylor Way. • Vehicular access from Keith Road provided from a right-in/right-out driveway. • Singular vehicular access to the site is in keeping with the surrounding residential neighbourhood to the north and the multi-family Evelyn by Onni development to the south.
1b	Minimal impact on established areas in terms of traffic & parking	• 40 parking spaces provided: 32 enclosed spaces within the underground parkade and 8 surface visitor parking spaces. • Parking provided for visitors and staff (residents will not drive and will not be permitted to own or park cars on the site). • Resident shuttle bus will be provided for. • Visitors and staff will have access to the parkade. • Traffic study considered a similar land use in North Vancouver and considered the impact of traffic with the Evelyn site to the south. The study concluded that traffic will not be worsened by the development and that parking is sufficient for the proposed land use.

	H3 Criteria	Evaluation
1c	Minimal impact on established areas in terms of obstruction of views	• The neighbours to the north and west will have the greatest potential visual impacts. • The site is heavily treed and screened with vegetation, which obscures views beyond. • Proximity between the existing single family homes and the rear of the proposed residential building will have the greatest impact. The applicant proposes to 'sink' the building into the ground so that it presents as a 2-storey building along the north property line.
2	Provides a degree of separation	• The site is bound by Taylor Way to the east which serves as a physical barrier to the Cedardale neighbourhood to the east. • The site is bound by Keith Road to the south. • A large mature evergreen hedge at the corner of Taylor Way and Keith Road adds to visual screening. • Mature tree retention along the north and west property lines is planned for, as well as additional tree and vegetation planting to buffer the site from the adjacent single family homes. • Increasing the setbacks to provide for increased screening and separation from the north and west property lines is required.
3	Appropriate housing types may include smaller townhouse units, low-rise multiple family housing, supportive housing, rental housing or housing that meets adaptable design guidelines	• A 2-storey common amenity building is proposed with an attached 3-storey residential building. • The project will offer supportive housing for senior citizens.
4	Housing intended for people with special accessibility needs, including certain forms of seniors' housing, should be located on relatively flat sites, close to transit, services and amenities	• This is a specialized seniors' living facility consisting of assisted living and memory care. • Residents will be of limited mobility and will not drive, thus on-site amenities are provided for as well as a resident shuttle bus. • No independent living units are proposed. • The site slopes at an average of 15%. • The site is located within close proximity to public transportation (north and south bound bus stops on Taylor Way) and Park Royal shopping centre. • On-site resident amenities are provided. • Resident shuttle van is provided.
5	Ensure siting, design and building form contribute to the desired neighbourhood character	• The proposed siting requires refinement to maximize separation between the residential building and adjacent single family homes. • Further information on how the proposal fits contextually within the neighbourhood is required.

Official Community Plan H10

The following table evaluates the proposal against the criteria set out in OCP Policy H10:

	H10	Evaluation
1	Examine the potential role of secondary suites in providing additional housing options for seniors.	• Not applicable.
2	Support the development of home service and assistance programs to allow seniors to remain in their existing homes and neighbourhoods.	• Not applicable.
3	Support the creation of new senior housing in areas with convenient access to services and transit.	• This proposal is for assisted living and specialized memory care. Residents will be of limited mobility and will not drive, thus on-site amenities are provided for as well as a resident shuttle bus. • The site is located within close proximity to public transportation (north and south-bound routes along Taylor Way, with transfers to regional destinations at Park Royal)

Community Consultation Meeting

On May 28, 2013, the District hosted a Community Consultation Meeting to obtain community comment and feedback on the proposal. A notice of the meeting was mailed to owners and residents within a defined notification area approved by Council on April 8, 2013. Notice of the meeting was also posted to the District website and on the Community Calendar.

The Community Consultation Meeting was attended by approximately 65 people and facilitated by District staff. The meeting began with an Open House where display boards and materials were set up around the room and members of the public were given the opportunity to discuss the project one-on-one with District staff and the applicant.

The meeting started with a staff presentation describing the purpose of the meeting, an outline of the application review process, the location and description of the site and an overview of the next steps in the review process following initial community consultation. The applicant then made a presentation on the proposal. Concerns and issues expressed by the audience were responded to by District staff and the applicant's team and were captured in meeting notes recorded by District staff. A questionnaire was also made available at the meeting.

Staff received 50 completed questionnaires. The questionnaires are characterized as follows *(an analysis of the received questionnaires is included in Appendix C):*

- 67% of the questionnaire respondents identified themselves as living within the defined notification boundary for the meeting.
- 50% felt that this type of housing (assisted seniors' living) was needed in the community.
- 53% did not agree that this type of housing should be located next to Taylor Way.
- 61% raised concerns over parking.

In summary, the proposal for seniors' assisted living has support, however the location of the project at the corner of Keith Road and Taylor Way and adjacent to single family homes was heavily criticized by those in attendance at the Consultation Meeting. Community concerns are:

1. that the proposed land use will negatively impact and further add to traffic congestion on Taylor Way and Keith Road;
2. that there is insufficient parking on site; and
3. that there would be a loss of privacy for adjacent neighbours resulting from the proposed building form and massing, increased density, and tree removal.

Design Review Committee

The DRC considered the proposal at its July 25, 2013 meeting, and members were generally supportive of the proposal and agreed that the proposed land use (supportive seniors' housing) was appropriate for the site. However, most DRC members felt that there was not enough contextual information provided in the submission to adequately comment on the relationship between the proposal and surrounding development.

The DRC passed the following resolution:

"THAT the Design Review Committee has reviewed the Maison Seniors Living Residence at 825 Taylor Way and 707 Keith Road and agrees that the site is appropriate for the use AND THAT the Committee recommends RESUBMISSION that addresses the following concerns:

- like to see more neighbourhood context in the presentation and proposal;
- be more responsive to context and materials;
- blend the buildings to a cohesive architecture with more variety to the massing and materiality;

- that the amount of useable opens space needs to be increased;
- re-examine the tree retention with invasive species in mind;
- see a more thorough specific sustainability approach;
- consider some kind of screening to create boundaries without a linear fence; and
- look at ways to mitigate light pollution to neighbouring residents.

Minutes from the Design Review Committee are attached as Appendix D.

Evaluation: Land Use

Meeting the needs of the elderly and those with special needs is addressed to a limited extent in the OCP. In general, the OCP focus is on the well-elderly rather than those with special needs, and on the impact of new development on existing neighbourhoods. The OCP acknowledges that there is an increasing demand for purpose-built seniors' housing and that many will need supported and assisted living, however fulfilling these types of housing needs remains a challenge. The proposal would provide for an alternative form of seniors' housing to address the needs of those that require assistance to carry out day-to-day living needs or are in need of specialized memory care due to conditions such as Alzheimer's.

The adjacent neighbours to the north and west of the site are strongly opposed to the development proposal. At the Community Consultation Meeting, 50% of questionnaire respondents agreed that this type of housing is needed in the community however 53% felt that this was an inappropriate location, primarily due to concerns of increased traffic at Keith Road and Taylor Way, and sufficiency of on-site parking for staff, visitors and support workers.

Although community consultation on this project revealed mixed reviews, redevelopment of this site would fulfil broader alternative housing objectives identified within the OCP and fill a housing gap for those who require support for carrying out day-to-day living needs.

Evaluation: Housing Type, Scale and Fit

The building consists of: a 2-storey common resident amenity wing at the southeast corner of the site, adjacent to Keith Road and Taylor Way and a 3-storey attached residential wing along the north and east property line. The residential portion has been "sunk" into the ground so that it appears as a 2-storey structure along the north property line, which abuts single family homes. The amenity wing is located away from the adjacent single family homes to internalize site operations away from the adjacent neighbourhood.

The result is that the entire building is located on the site to work with the natural sloping topography, which minimizes the scale of the building and allows it to fit contextually with the surrounding neighbourhood.

Refinement of the siting and massing along the north property line and a portion of the west property line is needed. The opportunity to maximize the setbacks in these areas to increase tree retention possibilities and additional landscaping will help to improve the buffering of the building from the adjacent single family homes.

Evaluation: Access, Traffic and Parking

A traffic study was supplied by the applicant. As the site is located along Taylor Way, it is well known that the area experiences heavy traffic volumes. The proposal includes 40 on-site parking spaces for visitors, staff and support workers. The ratio is 1 parking space per 3.3 beds, which exceeds the Zoning Bylaw requirement[1] for institutional uses. The proposed 40 spaces are in keeping with typical parking demands at comparable facilities.

The proposed driveway is located 35 metres to the west of Taylor Way. The proposed on-site hammerhead turn-around was reviewed with the fire department during preliminary meetings with the applicant. The applicant responded to initial comments and revised the slope of the driveway, the turn-around area to accommodate emergency vehicles and the functioning of the loading area inside of the parkade entrance.

The traffic study concludes that:

- peak traffic in the morning and evening would generate 25 and 32 car trips respectively;
- the proposed driveway to the site will operate at acceptable levels, that it is located far enough away from Taylor Way, and access should be restricted to right-in/right-out turns;
- with or without the proposed development, the intersection at Keith Road and Taylor Way currently operates beyond acceptable levels due to capacity constraints on the Lions Gate Bridge;
- intersection upgrades are not required to accommodate the propose development; and
- parking is sufficient compared with peak demands at similar facilities.

[1] Zoning Bylaw parking requirement = 34 spaces

3.2 Sustainability

The applicant has provided a sustainability strategy which includes targets related to the three tenets of sustainability: Social, Environmental and Economic (SEE) indicators. Key sustainable features include:

- Social: Supporting a specific housing need for an aging population; providing a high standard of architectural design to incorporate natural lighting and views from key gathering areas; and promoting accessibility to the site and within the building.

- Environmental: Use of native plant materials, retention of mature trees, siting the building in response to site conditions, and providing useable open space; application of vegetated swales and on-site storm water management including rain gardens to detain storm flows; green roof over the common amenity building to reduce heat-island effect and to blend the building within the landscape; other energy reduction techniques such as lower flow plumbing fixtures, strict insulation and glazing measures and optimized mechanical systems; and use of locally and regionally sourced building materials and use of low emitting materials and paints.

- Economic: Creation of construction jobs to the management and operation of the facility brings employment potential, local business spin-offs, and utilization of existing infrastructure and services without the need for significant expansion.

3.3 Consultation/Communications

As described in this report, this application was presented at a Community Consultation Meeting and was considered by the Design Review Committee. Project updates were posted on the District website.

If Council approves the staff recommendations, staff would work with the applicant to revise the proposal and then take the application back to the Design Review Committee for further consideration. Once the applicant addresses DRC and staff concerns, staff would bring forward amending bylaws and a draft Development Permit for Council consideration.

A rezoning sign will be posted on the property prior to Council giving consideration to any amending bylaws and holding a Public Hearing in accordance with the *Local Government Act.* Additionally, a Public Information Meeting will be held prior to the public hearing.

3.4 Conclusion

Staff recommends that Council advance the application in the review process given that the project is consistent with the Official Community Plan (OCP) objective of creating alternative housing for seniors and that the site is appropriate for the proposed use; and subject to the concerns raised by the Design Review Committee and from the Community Consultation Meeting being addressed in a revised development package.

Proposed bylaws and a proposed Development Permit would be presented to Council following further detailed review of issues (as set out in the recommendations) and subject to further recommendations from the Design Review Committee.

4.0 Options

(as recommended by staff)

A. The proposed development application advance in the application review process following consideration of issues detailed in the recommendation;

(or, alternatively)

B. Same as Option A, but with further direction on modifications to the project; or

C. Reject the application.

Author: Lisa Berg

Lisa Berg, Senior Community Planner

Appendices:

A – Context Map
B – Project Profile
C – Community Consultation Meeting, May 28, 2013
D – Design Review Committee Consideration, July 25, 2013
E – Development Proposal Booklet

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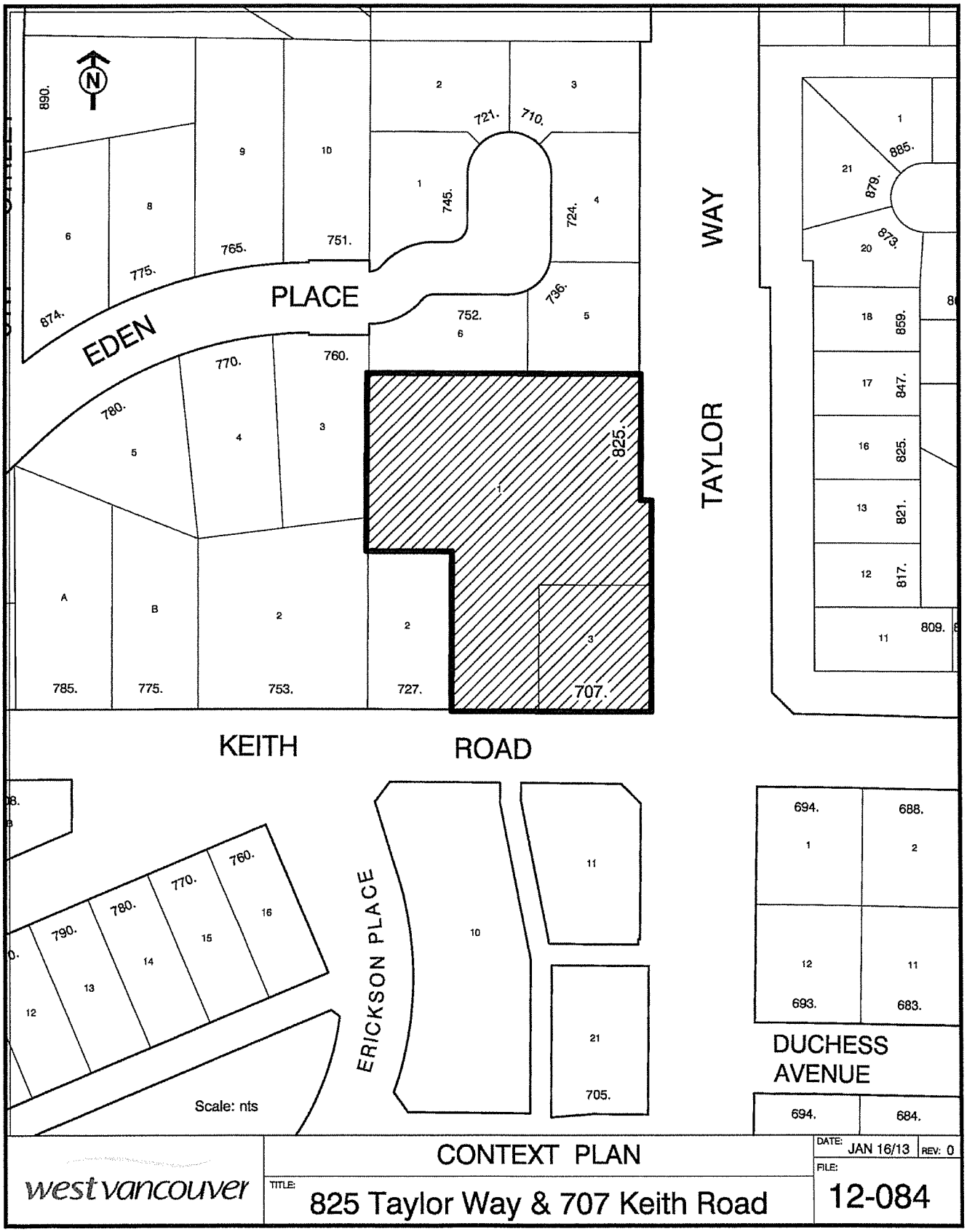
APPENDIX A



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APPENDIX B

PROJECT PROFILE

at February 27, 2013

Application:	**OCP/RZ/DP No. 12-084**
Project:	Maison Senior Living Residence
Applicant:	Milliken Development Corporation (for the owners)
Address:	825 Taylor Way and 707 Keith Road
Previously Before Council:	Not previously before Council
Other Comments:	An Official Community Plan (OCP) Amendment, Rezoning and Development Permit to a Comprehensive Development (CD) zone for a seniors' assisted living and memory care facility consisting of 110 beds (in 92 suites).

		EXISTING ZONE: RS3	PROPOSED[2] CD ZONE:
1.	**Gross Site Area:**	1,115 m^2 (minimum)	6,434.5 m^2
2.	**Floor Area Ratio:**	0.35	1.1
3.	**Building Area:**	n/a	
	Total area		9,381 m^2
	FAR exempt area		2,805 m^2
	Net area		6,576 m^2
4.	**Site Coverage:**	30%	35%
5.	**Setbacks:**		
	Front Yard (south, Keith Road):	9.1 m	8.9 m
	Rear Yard (north):	9.1 m	9.6 m
	Side Yard (west):	1.52 m	10.5 m
	Side Yard (east, Taylor Way)	1.52 m	4.0 m
	Side Yard-Combined:	1.9 to 12.1 m	14.5 m
6.	**Building Height:**	7.62 m	16 m
7.	**No. of Storeys:**	2 plus basement	5 (includes parkade)
8.	**Parking:**	1 per unit	1 per 3.3 beds = 40 Parkade: • 28 visitor/staff • 3 accessible • 1 shuttle bus Surface: • 8 visitor

[2] Source: Information provided by applicant

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APPENDIX C
COMMUNITY CONSULTATION MEETING, MAY 28, 2013

The Meeting

This meeting was hosted by the District and attended by an estimated 65 people. Presentation boards describing the project and the application review process were on display for attendees to review.

District staff opened the meeting with a presentation describing the purpose of the meeting, the principles of the DWV's development application review process, described the subject properties and the outlined the required municipal approvals. The possible next steps were outlined in the review process following initial community consultation.

The applicant then described the proposed project and gave details about the concept for the project. The project architect explained the building programming, site planning consideration, and design details. The landscape architect spoke about the established landscape character of the surrounding neighbourhood and how this was addressed in the design process.

People spoke in support of the project, but with concerns. The most common concerns were:

- Parking: those in attendance were concerned with the amount of parking that was proposed and if it would be sufficient for staff, visitors and support services.
- Traffic: with proximity to Taylor Way, Evelyn by Onni, Park Royal, the tower proposal for the White Spot site (at Park Royal) and other public assembly and institutional uses, the project could contribute to traffic congestion.

Staff closed the meeting and explained that Council will consider the next steps for the project and this would occur once staff reports out on the community consultations.

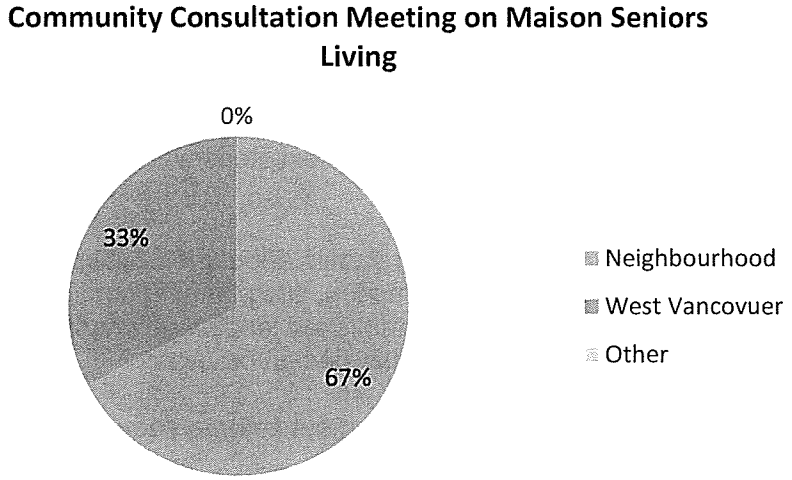
Attendees

While approximately 65 people attended the meeting, 59 people signed in and 50 people completed questionnaires.

Questionnaire Responses

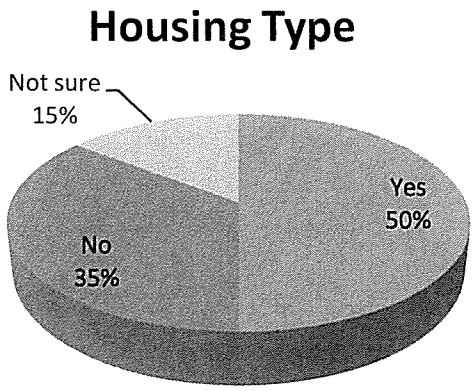
Those in attendance were invited to complete a brief questionnaire prepared by the District. 50 completed questionnaires were returned.

1. Please tell us where you live.



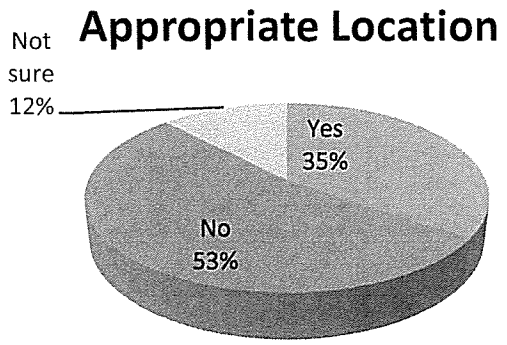
31 respondents (67%) identified themselves as being from the area within the neighbourhood as defined on the notification map approved by Council. 15 respondents identified themselves as living elsewhere in West Vancouver and no respondents said they were from elsewhere.

2. Milliken Developments is proposing to develop the site with a seniors' assisted living and memory care centre. This is a senior citizen residential project consisting of 110 beds in 93 bedrooms.
    a. Do you think this type of housing is needed in the community?



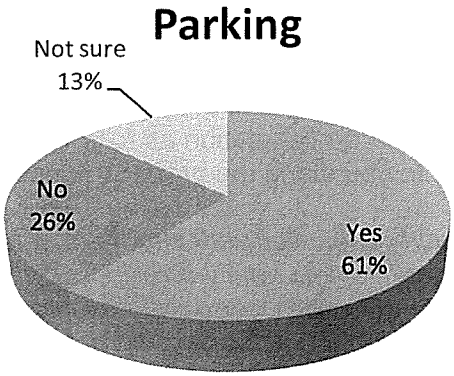
24 respondents (50%) agreed that this type of housing is needed in the community while 17 respondents (35%) said it was not. Of those who felt that this type of housing was not needed, reasons cited included that private-pay facilities were not needed as much as publicly funded facilities are, that the traffic the site would generate would be unacceptable and that housing for younger families should be looked at to avoid Ambleside becoming a 'seniors' ghetto.' 7 respondents weren't sure.

b. Do you think this type of housing is an appropriate use of land adjacent to Taylor Way?



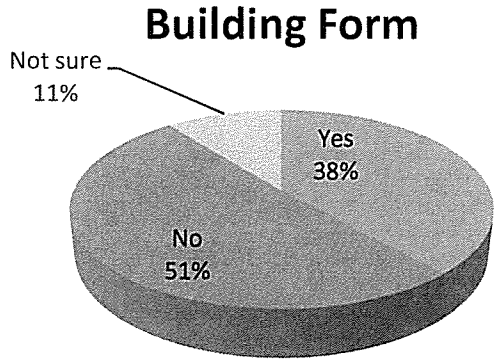
26 respondents (53%) did not feel that this site was appropriate for the development. Respondents felt that the site did not meet enough of the location criteria in the OCP (Policy H3) and that it was sited within a single family neighbourhood. Traffic, noise, difficult pedestrian access and impact to adjacent single family homes were all raised as major concerns. 17 respondents (35%) said the location was appropriate and 6 respondents (12%) weren't sure.

3. Residents of the center will not drive. 32 underground parking spaces are provided for staff, visitors and a resident's shuttle van. 8 surface parking spaces are provided near the driveway entrance from Keith Road. All vehicles will enter and exit the site from Keith Road. Do you have any comments or concerns related to parking?



23 respondents (61%) stated they had concerns over the amount of proposed parking. Respondents were skeptical of the traffic study provided by the applicant, and that it would underestimate the amount of parking that a facility of this type would require. With the intersection at Keith Road and Taylor Way admittedly operating at "unacceptable levels" within the traffic study, respondents were not convinced that the development would not further negatively impact traffic and parking in the area. With a lack of on-street parking, fear of high traffic levels with the Evelyn by Onni project in the future and mixed reviews by respondents of the traffic circle on Keith Road east of the driveway, concerns related to parking (and traffic congestion in general) are a main concern with regard to this development proposal. Respondents felt that there was not enough parking being provided on site. 10 respondents (26%) felt the parking being provided was adequate while 5 respondents (13%) weren't sure.

4. The building form is a 3-storey residential block located at the interior of the site, with common area facilities located in an attached 2-storey block at the corner of Keith Road and Taylor Way. The 3-storey residential building will present as a 2-storey building along the north property line. Do you agree with the proposed building form?



24 respondents (51%) did not agree with the proposed building form. Respondents felt that the massing of the building adjacent to single family homes was inappropriate in that a 3-storey apartment building next to 2-storey single family houses is intrusive and out of character and unacceptable to the immediate homes to the north and west. 18 respondents (38%) agreed with the proposed building form and suggested that the design was excellent and was an inventive and creative use of the topography. 5 respondents (11%) weren't sure about the proposed building form.

5. Stands of mature trees and vegetation are proposed to be retained and augmented with additional plantings on the perimeter of the site. The building is proposed to be sited closer to Keith Road and Taylor Way in order to optimize the distance of the building from single family housing to the north and west. The building is set back from lot lines, to provide building separation from adjacent lots and to provide space for trees and vegetation as follows (setbacks listed). How important is screening of the site to you along the property lines?

   Most respondents agreed that screening along the property lines was very important, if not essential given the location next to Taylor Way and adjacent single family dwellings. While some respondents were clear that they were not in favour of the proposed development, they felt that it was important to maintain trees and vegetation although screening did not solve their concerns over land use, density, traffic and parking. Some respondents were supportive of the proposed screening and tree retention plans and other comments varied between saving all trees for privacy and screening to removing them as they block views and natural light.

6. Please provide any additional comments that are important to you about the development proposal.

   Comments were polarized to either in support of the project as it fulfills a housing need in the community and that the project has been well designed for the site, to those who are opposed to the project. The comments that raised concerns about the proposal related to proximity to Taylor Way (impact on traffic congestion, noise and parking), being adjacent to single family homes (density too high, massing of the building, and screening and buffering) and concerns about a private-pay residence versus a publicly funded facility.

APPENDIX D
DESIGN REVIEW COMMITTEE CONSIDERATION

July 25, 2013 meeting minutes regarding the proposal for 825 Taylor Way and 707 Keith Road (Maison Seniors' Living)

4.1 825 TAYLOR WAY & 707 KEITH ROAD, MAISON SENIOR LIVING RESIDENCE. FILE 1010-20-12-084

Background:
Geri Boyle advised that this application at the initial phase in the approval consideration process. This phase includes holding a community meeting and review by the Design Review Committee. At the community meeting concerns were expressed about the proposal, both with specific design and broader general concerns including traffic. Following this phase staff will report back to Council on whether the application should proceed and on what basis.

Project Presentation:
Developer Don Milliken opened the presentation and advised that the proposal is for a seniors care facility entirely focused on assisted living and memory care - proposing 110 beds with 2/3 assisted living and 1/3 memory care. His studies showed a need in West Vancouver for 900 assisted and memory care private paid beds. Feels that this is very much in need in West Vancouver and that the topography and neighbourhood are suited for this type of facility.

Using model and a power point presentation Architect Ron Poon of Norr Architects reviewed the proposal.

- Features of site – heavily treed, steep slope, existing trees mitigate visual impact to neighbours. He noted that the team had been unsuccessful in gaining access to neighbouring properties to check sight lines during the preparation of the initial application.
- Proposed design – site organized 3 pieces, amenity pavilion to south; servicing aspect in middle; and assisted living and memory care residences to north. Keep quiet part of building backing onto private homes and pull building back to create a landscape buffer separation from the homes
- Parking - vehicular access bent to screen parkade from Keith Road, providing 8 surface parking stalls and 32 spaces in parkade.
- Architecture - building cut into grade so building as low as possible. South side 2 storeys with green roof, building steps back to north where residences occur, entire project to have flat roof. Contemporary design to fit site and integrate into community with strong horizontal roof planes allows low profile building and reduces impact.
- Materials - front building has a more public treatment with large amount of glazing to create open feel with natural stone base and timber framing; the residential portion is more restrained with combination siding panel, wood detailing and wood cornice. Tried to create a visually interesting elevation but be respectful to neighbours.

Landscape Architect, Gerry Eckford, reviewed the landscape concept for the project. He addressed tree management plan and the intent to retain as many trees around perimeter of site as possible. Landscape plan is in direct response to views from adjacent properties and addressing needs of residents. Path and seating provided throughout gardens for residents. Looking at neighbours window and balcony locations to screen the building as much as possible. Make effort to address frontage for visitors to site and have public frontage on building. Sustainability includes: green roof, rain garden, permeable paving, grasscrete turnaround and use of local or recycled materials. Fencing along property line to be different for each neighbour's property line to provide element of character.

Committee Questions:
The Committee provided questions, with the applicants' response in italics, including the following:

1. Why was 727 Keith not purchased as part of plan? *Property was not needed for the development and isn't on the market.*
2. Have you met with residents and how well have you satisfied their needs? *Had a meeting with Cedardale and Ambleside Rate Payers' association and met with 3 direct neighbours who had concerns on what their vistas would look like. In response have dropped building further into ground and increased setbacks so impact would not be any more than a residential house, also retained and added to the perimeter landscape with intent for the building to appear close to invisible.*
3. Would you consider lowering the building further? *To achieve the current height will be digging into hillside a lot, feel that building at lowest level.*
4. Will there be a lot of blasting to remove rock? *Need further testing, but based on information gathering from the Evelyn site feel that blasting will be minimal.*
5. How many visitor and staff parking spaces? *40 parking spaces total: 8 surface parking spaces adjacent to driveway, with the remaining 32 spaces under the building. Feel this is adequate for staff and visitors.*
6. Will the green roof be irrigated? *No.*
7. Staffing levels of facility? *Varies at different times, at peak time 60 staff but feel 90% will be taking transit.*
8. Is building wood frame? *No concrete non-combustible construction.*
9. A 6 ft. high fence is proposed around the north and west sides. What is the rationale for this height of a fence? *Intent to provide additional screening for neighbours' rear yards; by providing 6 ft. gives them more privacy.*
10. Materiality of the building what are components? *Base of building, parkade and chimney in natural stone; Hardi Panel siding; wood corners, cornices and brackets; heavy timber frame overhang covering outdoor spaces on pavilion.*
11. In terms of context, why are adjacent homes not shown on the model or drawings to understand massing relationship? *Model started out as study model and evolved into detail model. Have not been able to be on the property to measure the properties so at a disadvantage.*
12. Visitor parking stalls are they part of the 40? *Yes, providing 40 parking stalls - 32 parking stalls for visitors and 8 for staff. The 8 surface spaces for pick up interaction into front door.*

13. Sustainability statement what are the greenhouse gas reductions? *Putting in energy efficient mechanical equipment and initiatives. Feel social sustainability important on how to improve quality of life for community, overlying principle of keeping long time residents in the neighbourhood, extending relationship and connections, freeing up housing stock, creating economically viable business not a mathematical checklist more comprehensive.*
14. How dealing with light pollution as it seems that bedrooms in facility directly in line of site with neighbouring residents? *Addressing with landscape, committed to go to each neighbouring property and adjust planting with more evergreen trees to minimize the light pollution.*
15. Do trees shown on model represent size and location of existing? *Model does show existing coniferous and evergreens and sizes and locations are fairly accurate.*
16. What is fence material? *Cedar fence, not committed to any one style, happy to go to individual neighbours and select a style for each yard.*
17. Are there any existing view corridors to neighbours to north? *Not aware of any site lines except the forest view.*

Committee Comments:
Members' comments on the application included:

- Make sure photo representative of the real site lines; if taken from low angle they can be deceiving.
- Front entry sequence seems a bit thin because a whole lot of things going on, maybe a lusher entry sequence to make more special. Look at moving parking spaces to make more room, focus on getting more vegetation to wrap around the front to create a special entry sequence.
- The building has a great common area with glazing and articulation but back building seems boxy; 2 different characters and architecture. Like to see more relationship architecturally.
- Think the use is well-suited to this location (i.e., a busy intersection on a major arterial route). Context - don't understand from the presentation the context; more work needs to done. I understand lack of access to adjacent properties, but it is your issue to figure out. Think parking will be an issue, as there is no immediate street parking for visitors, important in moving forward to make sure whatever evidence have supports this number of parking spaces is not anecdotal; needs to be imperial in order to make sense.
- Like the park like setting but feel 6 ft. high fence loses a lot of character, think blurring the boundaries is a stronger design response than creating "own private Idaho" with 6 ft. fences. Elevation and materiality are not at level of design resolution or expectation that they should be given the importance of this location and significance of this use; needs more design development and richness of residential portion as seems uninteresting and bland. Sustainability needs to address long time lifecycle costs as big issue for this type of facility, not generalities it needs to be crystal clear on strategies. The earlier you implement strategies the less costly and more appropriate they area.

- Feel use appropriate for site. Landscape has too little useable space, a result of retaining too many trees; plan being driven by apologizing for existing to neighbours. Some of the trees saving are not worth saving and should be removed to create open space, pull walls back from building as feel it is a dark not pleasant place to be. Interplay needed between saving some trees and footprint of building being too large. Like to see north east corner popped up more and become taller so building could come away from northern property line more. Not attending to what building and use of property are going to be for next 40 or 50 years by just trying to retain those trees. Think trellises are light in relation to walls and what is around it. Building language not too bad; colours a little safe; stone on east side not seen by anyone; should take money and put in background building materials.
- Think not a bad location for this development; important to go out of way to make sure residents happy with final plan; consider lowering building as much as possible to minimize impact. Don't feel traffic and parking is a major issue, do have questions with numbers created in traffic report *(Traffic Engineer answered clarified questions)*. Don't feel traffic impact is a game changer for this development, but background traffic with the new Onni Development will be the issue.
- Question materiality. In looking at neighbourhood and Evelyn Drive development, don't see any hardi board; feel this is a lower level of finish than what neighbourhood should have. Concerned that deciduoustrees will create light pollution to neighbours. Density is filling whole site, wonder if look at less density to make project work; consider outdoor space as feel pushing to all boundaries of site sets up difficulty to neighbours. Architecture appears as one building attached to another building and the bulk of the housing being too repetitious; creating more massing changes might help - something that takes the big length of the building and breaks up a bit. Also address elevation looking up at building from Evelyn Drive. Look at massing changes and getting more out of site; look at burying heights so working more sympathetically with the neighbours. Agree good use for this site but wonder if project could work with less density.
- Wouldn't want to see number of parking spaces reduced.

The presenters clarified comments on traffic and outdoor amenity space requirement for memory care residents and assisted living clientele.

Resolution:

It was Moved and Seconded:

THAT the Design Review Committee has reviewed the Maison Seniors Living Residence at 825 Taylor Way and 707 Keith Road and agrees that the site is appropriate for the use AND THAT the Committee recommends RESUBMISSION that addresses the following concerns:

1. like to see more neighbourhood context in the presentation and proposal;
2. be more responsive to context and materials;
3. blend the buildings to a cohesive architecture with more variety to the massing and materiality;

4. that the amount of useable open space needs to be increased;
5. re-examine tree retention with invasive species in mind;
6. see a more thorough specific sustainability approach;
7. consider some kind of screening to create boundaries without a linear fence; and
8. look at ways to mitigate light pollution to neighbouring residents

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Maison

a Symphony Senior Living Community

milliken DEVELOPMENTS
Perfectly Urban.

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ARCHITECTS PLANNERS

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MAISON SENIOR LIVING RESIDENCE
DESIGN BRIEF - RATIONALE FOR PROPOSED DEVELOPMENT

REZONING, OCP AMENDMENT & DEVELOPMENT PERMIT APPLICATION

The proposed Maison Senior Living, private pay, boutique assisted living and memory care (Alzheimers and dementia) community is spearheaded by long time West Vancouver residents Don Milliken and Mark Coleman. Don and Mark are the founding partners of Maison Senior Living. Maison's proposed 93 suite / 110 residences community at the northwest corner of Taylor Way and Keith Road is intended to address a serious need for high quality seniors' care in West Vancouver. At present, according to a recent study by the Altus Group there is an unmet demand for 900 assisted living and memory care, private pay (i.e. not government funded) beds in West Vancouver alone. The available supply of this style and quality of seniors' care in West Vancouver is 70 beds. These 70 beds are divided between Hollyburn House and Amica. In each of these communities it is very difficult to be accepted as an assisted living or memory care resident unless you previously lived as an independent resident in the same facility.

The sad state of affairs is that residents in comfortable independent living focused communities such as Hollyburn House, Amica and even the future Westerleigh usually progress to the point that they require more care than is available at these communities. At that point these seniors, and their families, often face the prospect of either moving to a publicly funded facility or moving outside of West Vancouver. Unfortunately, individuals who have resided in West Vancouver for decades are often forced to leave their home community to live elsewhere in the lower mainland. This is usually not the first choice of the senior or their families. Don Milliken experienced exactly this situation with his father beginning 8 years ago. His father and mother had lived in West Vancouver for over 30 years. His father's deteriorating condition led to home care, which worked for a while. When home care was no longer practical he was forced to move to a community outside of West Vancouver. His Alzheimer's excluded him from being accepted at Hollyburn House and Amica and it was the family's choice not to put him on a waiting list for West Vancouver government funded communities. Literally hundreds of West Vancouver families are facing similar situations. Maison Senior Living is intended to fill this much needed care for seniors in West Vancouver.

The generally accepted description of the levels of senior's care in Canada is independent living, assisted living and memory care. Independent living can be generally described as senior's living together in a community for social interaction and group activities and often dining in a common dining room rather than preparing meals themselves. Independent living accommodations vary but often include one and two bedroom apartments with kitchens. Examples in West Vancouver of high quality, private pay independent living focused communities are Hollyburn House, Amica and the future Westerleigh. Assisted living communities provide a higher level of care for seniors who have somewhat of a level of physical and/or mental disability. In an assisted living community a senior may have some level of, perhaps, Alzheimers and/or may have difficulty, for example, getting dressed or showering themselves. They may also be taking some medications which may require management. In West Vancouver, Hollyburn House and Amica provide 35 beds each for seniors with assisted living needs. Generally, though, a senior will only be accepted as an assisted living resident in these communities if they have already been living in the community as an independent living resident. Memory care refers to seniors with Alzheimers or dementia. Because their memory has deteriorated, these seniors require considerably more assistance and guidance with most day to day activities. Memory care seniors may or may not require physical assistance. In West Vancouver there is no private pay memory care available.

The proposed Maison West Vancouver is a community designed for 74 residents with assisted living care needs and 36 residents with memory care needs. There will be no independent living seniors residents in Maison West Vancouver. Maison's building design reflects the two levels of high quality senior's care being provided. At the south facing front entrance to Maison West Vancouver, on Keith Road, there is a spacious ground floor patio adjacent to a large common area living room with library, fireplace, theatre, a games and meeting area, and a bistro. Upstairs, accessed via an elevator or winding grande staircase, is a large dining room with fireplace, an expansive outdoor deck, and a private dining room. This second level also includes the kitchen, staff offices, and a lobby connection to the covered parking. These two levels are for the use of Maison's seniors with assisted living care needs.

Behind the facilities described above are three residential floors. The lowest floor is designed exclusively for a maximum of 36 senior's with memory care needs. This floor has expansive outdoor areas with south facing patios and a large outdoor patio and walkway to the north. The outdoor area to the north is very private and peaceful as a result of retaining walls and the site's topography. In addition to large activity areas, this floor has its own spacious private dining room with large deck with a view of the Lion's Gate Bridge and Stanley Park.

Thirty seven seniors will occupy each of floors 2 and 3 (for a total of 74 residents with assisted living care needs). These assisted living floors each provide large activity areas, including a library area on each floor and both have generous south facing deck areas and excellent views. Seniors on the assisted living floors will dine, use the bistro, use the private dining room for a family gathering, watch a movie, sit by one of two fireplaces and generally gather and interact with other residents in those areas adjacent to the front entrance and described above.

From a regulatory perspective, the Maison Senior Living project requires a rezoning and amendment to the Official Community Plan if it is to be realized. It is clear that such an amendment is both anticipate and strongly supported by Policy H3 in the Housing chapter of the OCP because of the great improvement to housing diversity that comes with the Maison project. Detailed in this design brief, the enclosed design drawings are the specifics as to how the Maison project manages to meet and go beyond the H3 policy intent:

- minimal impact on established areas in terms of access, traffic, parking, and obstruction of views;
- provides a degree of physical separation (e.g. a road, green belt, alternate use, or change in natural grade) from the surrounding neighbourhood
- housing types include low-rise multiple family housing and supportive housing
- housing is intended for people with special accessibility needs, including certain forms of seniors' housing, should be located on relatively flat sites, close to transit, services and amenities
- siting, design and building forms contribute to desired neighbourhood character

With this, it is anticipated that the Maison application will be recognized as a noteworthy example of an appropriate OCP amendment that aligns with the District of West Vancouver planning principles and meets long-term community needs.

COMMUNITY CONTEXT

Demographic trends in North America, British Columbia and West Vancouver are well recognized with the largest segments of our population quickly approaching retirement and senior-status. The OCP for the District of West Vancouver repeatedly acknowledges this statistic reality and further reveals that this trend is amplified in West Vancouver, where populations are notably older than neighbouring municipalities:

"Over the decades, West Vancouver's demographic profile has shifted from a fairly homogeneous population of mostly young families with children, to one of a greater proportion of older residents and smaller families.

BC Stats projections indicate that the aging trend in West Vancouver will continue, with fewer young children and youth and significantly more older people than today.

The Maison Senior residence in West Vancouver is a specific reaction to address these new population characteristics and to ensure a known void is filled for the future needs of the community.

Specifically, the Maison project is targeted at a segment of the aging population that can no longer live independently. Assisted living with memory care is a critical component of housing diversity which many communities continually strive to develop, so older residents can remain in their neighbourhoods and close to family. Along with the specific statistics that are provided in the Altus report, this reality is also clearly recognized in the OCP:

"West Vancouver's growing proportion of older residents will require a considerable increase in health, support and housing services to meet their varied needs."

Further support for the project within a community context is found in the Social Planning chapter of the OCP where greater accessible is encouraged for buildings with more diverse health and wellness services. These specific elements of social planning are main tenets in Maison Senior Living community.

SITE CONTEXT AND LAND USE

This application proposes to consolidate and rezone the properties 707 Keith Road and 825 Taylor Way, located the northwest corner of Taylor Way and Keith Road. Currently zoned RS3, the resultant zone will be a Comprehensive Development (CD) zone fitting for a seniors' specific use.

ADJACENT LAND USES ARE:

NORTH: two single-family lots zoned RS3. The lots are up-slope of the Maison site with several mature trees existing within the setback area on each side of the property line.

SOUTH: across Keith Road, the Evelyn project is zoned CD with a mix of residences ranging from single family houses to apartment buildings.

EAST: five single-family lots zoned RS3, across 4 to 5 lanes of Taylor Way. The homes are east of a soil bank and a line of trees that line Taylor Way. Only a very small portion of houses are visible from the street.

WEST: two single-family lots zoned RS3. Several mature trees exist within the setback area on each side of the property line.

A summary of the site statistics for the proposed 3- to 4-storey Maison residence is as follows:

PROPOSED ZONE CHARACTERISTICS

Site size	6,443 sqm
Building Coverage	40.8%
Total Site Coverage	61%
Floor Area Ratio (FAR)	1.02
Maximum Height	10 m

Note: statistics are generated from the gross site area before accounting for a 172 sqm road dedication

As indicated above, the H3 policy recommends an OCP amendment for single family properties such as the an RS3 zone to a denser form if the resulting use is contextually appropriate, sensitively designed and notably beneficial to housing diversity in a meaningful way. The relationship of this relatively denser project to Taylor Way is supported by strong planning logic that often points to denser forms along main transportation corridors. Such developments along busier roads provide an effective transition to the less dense, single family neighbourhoods further from the road and are a common urban design strategy. The wider width of this arterial road also provides good distance between the single family houses to the east, in addition to the heavy tree cover that exists along the road as a screen. The Evelyn project to the south is just north of Park Royal and includes a multi-family development in the scale proportional and greater than the Maison proposal. From a land use perspective, the Maison development provides a logical extension of slightly increased density moving north from the important commercial hub of Park Royal, especially for a needed seniors' facility like the Maison residence. Lastly, the strategies to ensure an appropriate interface with the single-family homes to the north and west are described in the Design sections below.

Also relevant in the assessment of the Maison proposal are other OCP amendments recently transacted in the District of West Vancouver. The above mentioned Evelyn project is a relevant example for the Maison project as is the recent Westerleigh development. The Evelyn project reinforces the OCP vision of increasing density in sites close to commercial centres with a diversity of housing. The OCP amendment for the Westerleigh seniors' project was supported under the framework of the H3 policy for also filling a housing need in the community. Both the site and policy context of these precedent examples lend strong support for the OCP amendment rationale for the Maison project. Notably, the Westerleigh does not provide the breadth and diversity of assisted living and memory care services that will be available at the Maison residence. As a result, the housing niche filled by the Maison project is arguably even more beneficial to the community than the Westerleigh.

SITE, BUILDING AND ARCHITECTURAL DESIGN

The enclosed Maison design drawings illustrate the various considerations and treatments that were given for the facility and surrounding interfaces. The final design was derived through an iterative process including conscious design and valuable input from District planning staff. The building orientation and aesthetics were systematically designed and redesigned to arrive at a solution that best considers the site context.

The Maison property slopes consistently down from the northwest to the southeast. This aspect of the site along with the adjacent single-family houses to the north and west provide the main considerations for siting the building and designing the appropriate form given the interfaces to the adjacent properties. In this regard, a notable design decision was to locate the building closely to and along Taylor Way. The majority of the building mass was purposefully directed at the east side of the site and set into the natural site grade. This yields a maximum distance between the Maison building and the adjacent house at the southwest along with a much shorter building height adjacent to the northern houses. The east elevation of the building illustrates that the south portion of the building is 2-storeys stepping up to 4-storeys. Moving further north, the increasing grade decreases the building height to 3-storeys, eventually revealing a building height of no more than 2-storeys above existing grade. The building is in fact 3-storeys at the north end, but has been purposefully recessed into the existing site topography to create an appropriate interface with the northern houses. Similarly, the north elevation reveals that the building is even more recessed at the northwest corner yielding a building height of only 1.5- storeys above existing grade. The building siting and form were also informed by various internal modifications such as the reposition of the kitchen to front Taylor Way rather than be closer to the existing house. In all, the exercises to continually refine these building elements led to a building form and location that fully considers the site context and respects the neighbouring properties. These design decisions are one example where the proposal is consistent with Policy NE 2, which is intended to minimize visual impacts of new development through design and construction.

The architectural aesthetic of the Maison residence is contemporary coastal style and has been thoughtfully designed to appropriately integrate into the local community and context. The horizontal roof planes of the building allow for a lower building profile to reduce visual impact and overshadowing. Elements of the façade with generous use of wood and glazing give a cadence to the building walls, and together with the various decks and courts, the building generates a unique character. The use of stone at the building base, cement board siding and panel systems for the upper floors and use of timber structure and detailing give the building a classic West Coast expression. A natural colour palette will also be used to ensure the building blends into the natural surroundings.

Given that the Maison residence will be an on-going operation, there is vested interested in incorporating sustainable and green building elements that will make the residence both energy efficient and a more enjoyable place to live. To this end, a number of components have been woven into the building design that meets the intent of superior environmental design stated in OCP Policy BF–A1. A benefit of this is also the relative reduction in greenhouse gas emissions that is targeted in the Climate Action chapter of the OCP. Included in the efficiency elements of the project will be lower flow plumbing fixture for water reduction and strict insulation and glazing measures. Mechanical systems will be optimized during detailed design to ensure the best balance of personal comfort and system efficiency for reduced consumption. In relation to other experiential components, local and regional materials and systems will be used whenever possible, including the use of wood structure for accents and exterior deck elements. Low emitting materials and paints will be specified and are in line with wellness goals of the facility. The south facing façade of the building is also an important component that will provide daylight and views from key gathering areas in the residence. Lastly, a vegetated roof over the common amenity area and a reflective roof over the remainder of the building will be provided to significantly reduce heat-island effect from the new building and help further realizing the intent of Policy NE 2, by helping to minimize environmental and visual impacts of the building.

In conclusion, numerous design strategies were utilized to ensure the suitable integration of the Maison residence into the surrounding area. The result is a building that strives and successes to contribute positively to the neighbourhood character.

LANDSCAPE DESIGN

An Environmental Site Inspection and an Arborist Report were completed for the project, which meets the intent of Policy NE 7 to inventory natural assets on site. As detailed in these reports, the existing site is predominately in a natural condition with a broad range of native plant material mixed in with several invasive species. While there are a number of valuable trees, many of the existing trees have previously been topped and are in fair to poor condition. The more valuable trees are located along the north property line and will prove valuable in their retention. The siting of the building and the creation of usable landscape open space is in direct response to the site opportunities. The proposed landscape design demonstrates continuity with the surrounding environment by maintaining the pre-existing site contours.

The overall landscape strategy for this project is to provide a calming natural environment for the use and enjoyment of residents and visitors. The front yard will have a slightly more ornamental feel picking up some of the character of Taylor Way above the Upper Levels Highway with a formal row of cherry trees and under plantings. The treatment of the corner of Keith Road and Taylor Way will provide a balance of a strong corner treatment with the provision of some views for the residents. Low retaining walls and site signage will be clad in natural stone.

The rear yard and flanking side yards respond directly to the natural forest character of the site. Tree retention and restoration to a healthy natural condition has been a priority with an exhaustive tree inventory and analysis forming the basis of the tree management planning and retaining wall configuration. This again supports the intent of Policy NE 2 to minimize or mitigate environmental impact through restoration practices. Particular attention has been paid to trees along the north and west edges of the site to maintain dense screening between the project and adjacent homes. Where gaps in the existing planting do exist, additional evergreen and deciduous trees will be planted in a natural pattern. The existing dense mixed hedging along the Taylor Way frontage will also be retained to provide screening to the building. Understory plantings will be predominately native to maintain a consistency with the existing site and in response to solar access.

A range of open spaces has been provided for the use of residents and with an understanding of the range of capabilities. Each space has a unique character in response to its solar orientation and views. At grade patios have been provided at the north and west faces with an accessible path connection.

These two patios will be quiet and reflective. Elevated patios are also provided adjacent to amenity and dining areas and will have more sun and distant views.

Sustainability has been further addressed in part through the protection and enhancement of the retained site, the use of a native drought tolerant plant palate, and through the introduction of storm water management strategies including rain gardens to detain storm flows.

INFRASTRUCTURE

A Servicing Brief completed by CREUS Engineering and it has been determined that the requirements of the proposed Maison development can be accommodated within the existing capacity of the District civil infrastructure. Given the central and urban location of this redevelopment, it is clear that the project does not unduly burden the existing infrastructure. Specific to stormwater management, the project is also committed to the intent of OCP Policy NE 8 and to deliver a stormwater management solution in a location and manner that promotes site sensitive design.

A Traffic Impact Study completed by the MMM Group indicates that there would be no major traffic or parking impacts generated from the Maison project. The nature of a seniors' residence, especially with memory care services, typically does not generate a high level of traffic or parking impact and any minor impact can and has been readily mitigated. As a result, filling this housing need with a facility such as the Maison project consequently fulfills the Transportation & Mobility Policy T2 and T5, to reduce vehicular dependency. Specifically addressed in the report is that "The north and southbound left-turn lanes at the Keith Road / Taylor Way intersection are anticipated to accommodate future traffic volumes such that vehicle queues (generated by left-turning traffic) will not spill back into the through traffic lanes on Taylor Way." This statement is true in a condition with or without the Maison development. The overall minimal impact associated with the traffic and parking requirements of the Maison project is consistent with expectations of the H3 policy.

CONCLUSIONS

We are confident that that the Maison Senior Living project will be a significant benefit to the housing diversity of West Vancouver given the community demographic trends and local assisted living statistics. The proposed location for the Maison residence is ideal for a small, high-quality assisted living and memory care community as the site offers very convenient access to family members and staff taking transit and provides for beautiful views for residents from a number of terraces and balconies. Our project team has invested a great each of thoughtfulness, working with the existing site topography and features, to create a building and landscape design that integration sensibly into the natural surroundings. Numerous sustainable features are also incorporated to enhance the living experience for residents and lessen the impact on our environment. We are proud that this application meets the very high standards set for the Maison Senior Living project and we look forward to taking the next steps toward realizing the vision for this important residence to West Vancouver.

Sustainability Statement
Maison Senior Living Residence
Rezoning, OCP Amendment & DP Application No. 12-084

The following is a Sustainability Statement in support of the aforementioned DP Application for 825 Taylor Way and 707 Keith Road. This document is an assessment of the project's overall contribution to sustainability when analyzed under the specific headings of *environmental*, *social* and *economic* indicators.

1. **Environmental Indicators:**

Given that the Maison residence will be an on-going operation, there is vested interested in incorporating sustainable and green building elements that will make the residence both energy efficient and a more enjoyable place to live. The applicable environmental features of the Maison West Vancouver proposal relating to green design / construction and in addition to ecological protection and restoration can be summarized as follows:

- ***Landscaping Strategy*:** the existing site is predominately in a natural condition with a broad range of native plant material mixed in with several invasive species. While there are a number of valuable trees, many of the existing trees have previously been topped and are in fair to poor condition. The more valuable trees are located along the north property line and will prove valuable in their retention. The siting of the building and the creation of usable landscape open space is in direct response to the site opportunities. The proposed landscape design demonstrates continuity with the surrounding environment by maintaining the pre-existing site contours. The overall landscape strategy for this project is to provide a calming natural environment for the use and enjoyment of residents and visitors alike
- ***Vegetated Swales / Storm water Management*:** reference should be made to the landscaping drawings which show the incorporation of vegetative swales and pervious paving materials. Sustainability has been further addressed in part through the protection and enhancement of the retained site, the use of a native drought tolerant plant palate, and through the introduction of storm water management strategies including rain gardens to detain storm flows
- ***Building Support Systems*:** a vegetated roof over the common amenity area and a reflective roof over the remainder of the building will be provided to significantly reduce heat-island effect from the new building and help further realizing the intent of Policy NE 2, by helping to minimize environmental and visual impacts of the building
- ***Energy Use Reduction*:** a number of components have been woven into the building design that meets the intent of superior environmental design stated in OCP Policy BF–A1. A benefit of this is also the relative reduction in greenhouse gas emissions that is targeted in the Climate Action chapter of the OCP. Included in the efficiency elements of the project will be lower flow plumbing fixture for water reduction and strict insulation and glazing measures. Mechanical systems will be optimized during detailed design to ensure the best balance of personal comfort and system efficiency for reduced consumption
- ***Site Contours*:** the overall design has been realized out of a recognition and respect for the existing site contours. The successful marriage of the building form to the site had been a strong priority from the outset
- ***Building Materials:*** local and regional materials and systems will be used whenever possible, including the use of wood structure for accents and exterior deck elements. Low emitting materials and paints will be specified and are in line with wellness goals of the facility

2. **Social Indicators:**

The social sustainability of the Maison West Vancouver concept is reinforced through the following features:

- ***Supporting a Specific Need*:** the OCP for the District of West Vancouver repeatedly acknowledges the demographic statistic that West Vancouver in particular contains a large population percentage quickly approaching retirement and senior-status. This facility stems from an actual social need within the District
- ***Architectural Design:*** a high standard of architectural design and exterior finishes have been incorporated into the overall proposal. The south facing façade of the building is also an important component that will provide daylight and views from key gathering areas in the residence
- ***Accessibility:*** the convenience and accessibility of the site to facilities within the locality ensure that the social element of the proposal is not left wanting

3. **Economic Indicators:**

In addition to the environmental and social features of the proposal the economic sustainability of the proposal cannot be understated:

- ***Employment*:** the realization of such a proposal would no doubt prove beneficial from an employment perspective; both short and long-term. From the construction through to the management and operation of the end product the employment potential could be more than promising for the District. Should the vision become a reality the economic benefits for local businesses, workers and contractors would be significant
- ***Diversification & Enhancement:*** such a facility would naturally result in a net increase to the property tax base and in addition would create spin-off opportunities for the local primary and secondary sector; supporting local businesses and producers
- ***Use of Existing Infrastructure:*** it is proposed to maximize the existing municipal infrastructure and services without the need for significant expansion

In conclusion, numerous design strategies were utilized to ensure the suitable integration of the Maison residence into the surrounding area. The result is a building that strives and succeeds to contribute positively to the neighbourhood character ensuring that it is environmentally, socially and economically sustainable.

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CEMENT PANEL
HARDIE

COBBLESTONE

METAL PARAPET

TIMBER
NATURAL STAIN

SWALE AT TAYLOR WAY

GREEN ROOF SYSTEM

REAR FEATURES

FURNITURE

ENTRY FEATURES

PATTERNED CONCRETE

CEMENT SIDING
HARDIE

WOODSTOCK BROWN
CHESTNUT BROWN
TIMBER BARK

WATER FEATURE

NATURAL STONE
BASALT LEDGESTONE
PATTERN

CURTAIN WALL GLAZING
SYSTEM WITH CLEAR
DOUBLE GLAZING

CLEAR TEMPERED
BALCONY GLAZING

GLASS FEATURES

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NORR ARCHITECTS · PLANNERS

CONTEXT

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NORR ARCHITECTS PLANNERS

CONTEXT

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NORR ARCHITECTS PLANNERS

SITE PHOTOS

Note: Access to surrounding properties to photograph views looking into the site has not been approved by property owners

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NORR ARCHITECTS PLANNERS

SITE PHOTOS

Note: Access to surrounding properties to photograph views looking into the site has not been approved by property owners

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NORR ARCHITECTS PLANNERS

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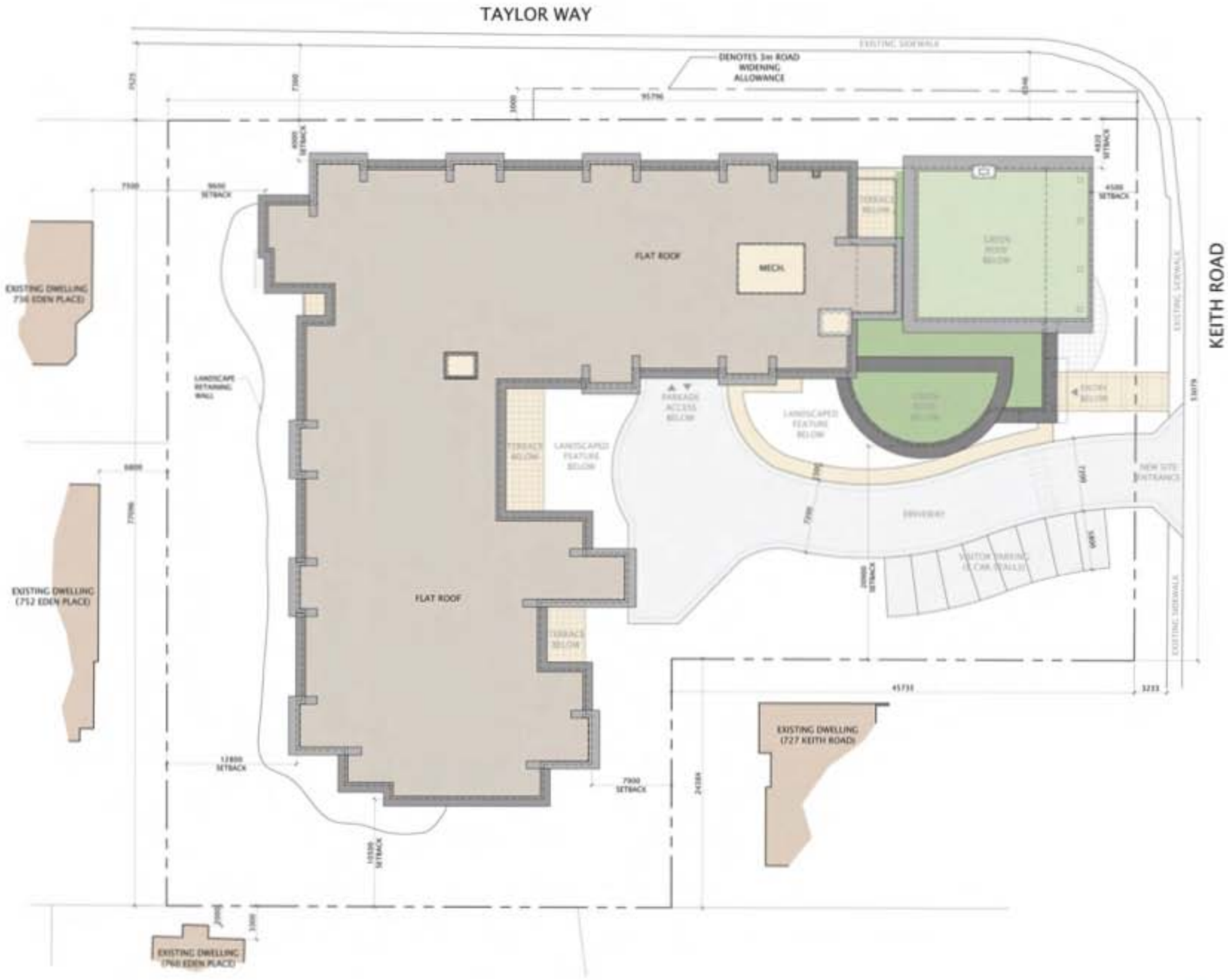
NORR ARCHITECTS PLANNERS



SITE PLAN

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NORR ARCHITECTS PLANNERS

LOWER AMENITY LEVEL

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NORR ARCHITECTS PLANNERS

UPPER AMENITY & PARKADE LEVEL

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RESIDENTIAL LEVEL 01 - MEMORY CARE

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NORR ARCHITECTS PLANNERS

RESIDENTIAL LEVELS 02 & 03 - SUPPORTIVE LIVING

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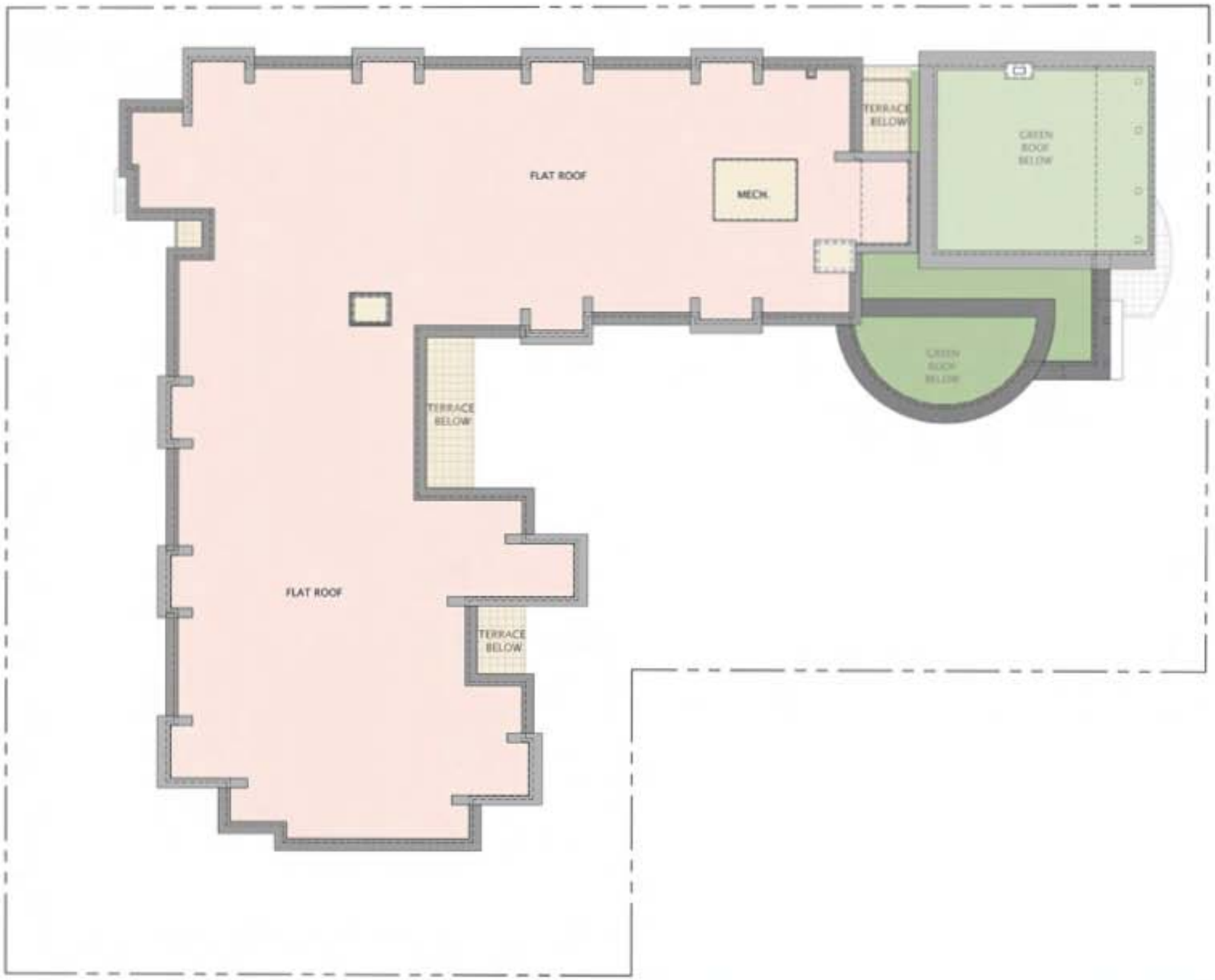
NORR ARCHITECTS PLANNERS



ROOF PLAN

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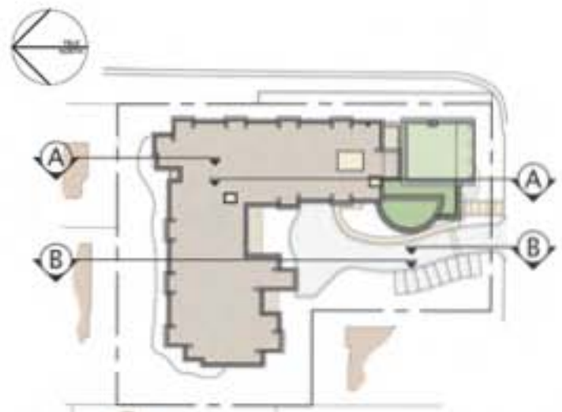
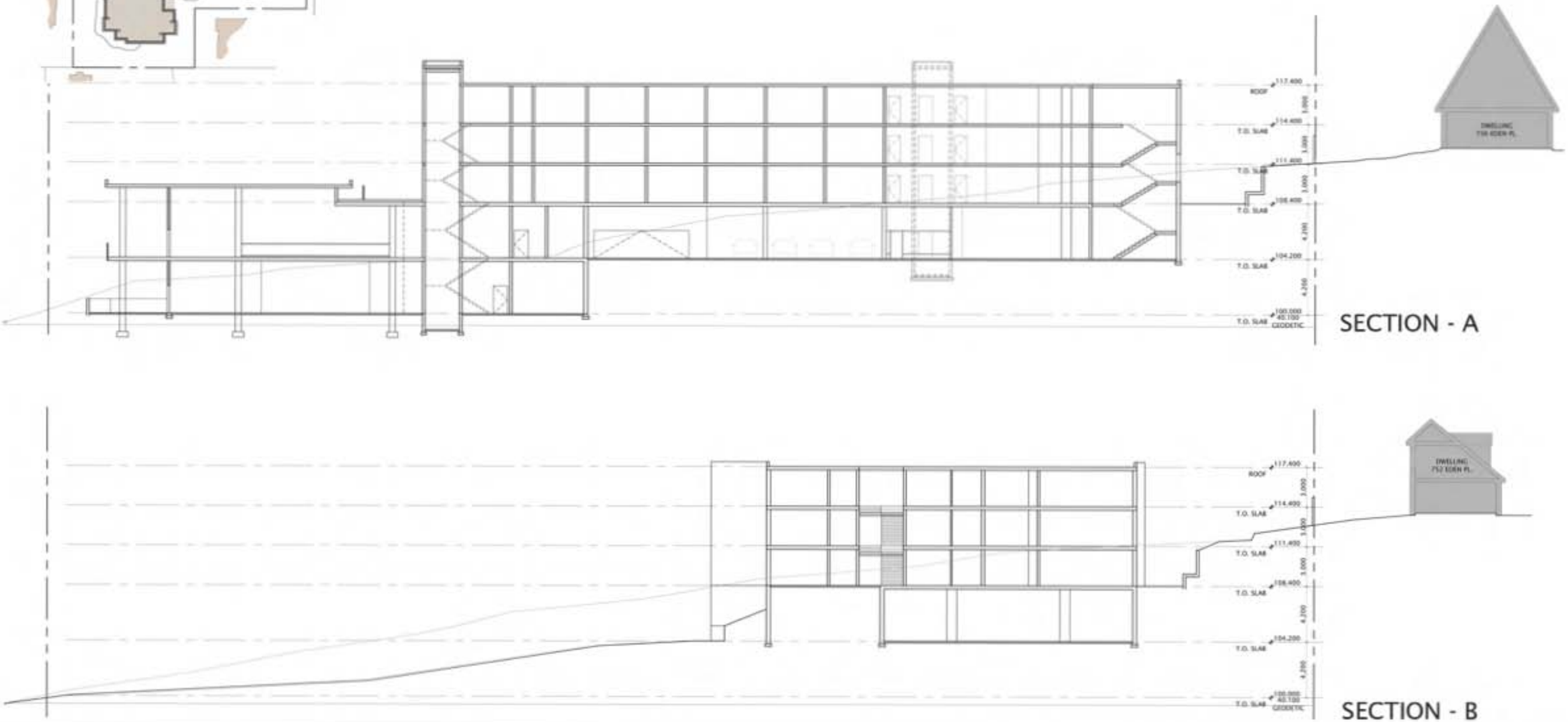
NORR ARCHITECTS PLANNERS





SECTION - A

SECTION - B

SECTIONS - LOOKING WEST

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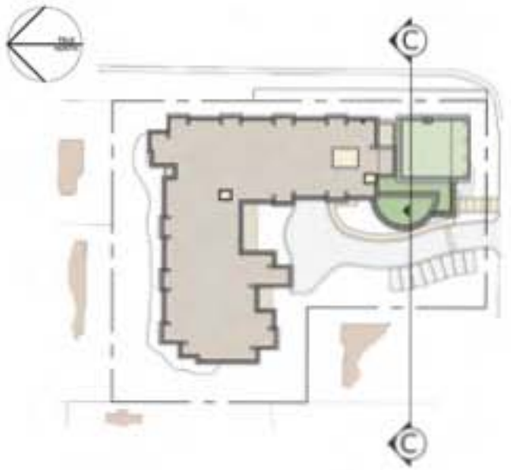

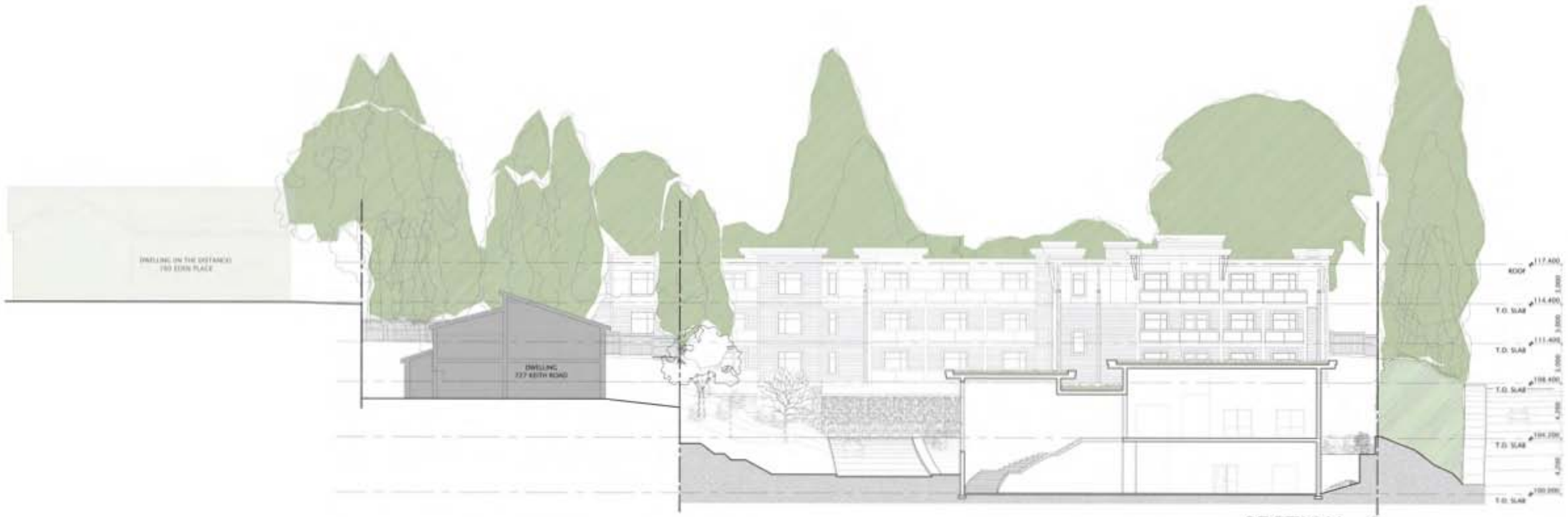

SECTION - C

SECTION - LOOKING NORTH

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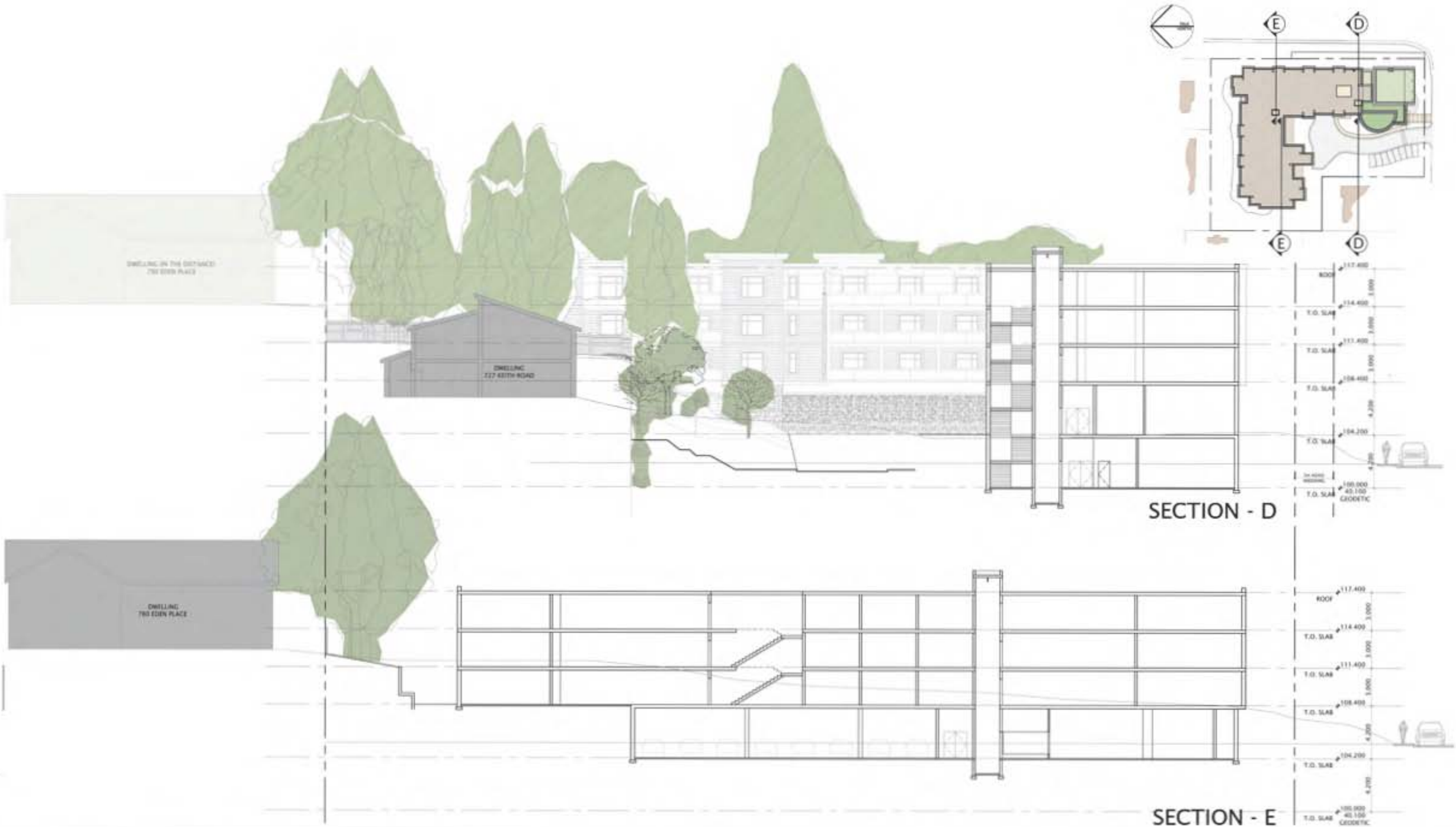
NORR ARCHITECTS PLANNERS



SECTIONS - LOOKING NORTH

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NORR ARCHITECTS PLANNERS

EAST ELEVATIONS

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NORR ARCHITECTS PLANNERS

C - FROM NEIGHBOURING PROPERTY

D - FROM PROPERTY LINE

WEST ELEVATIONS

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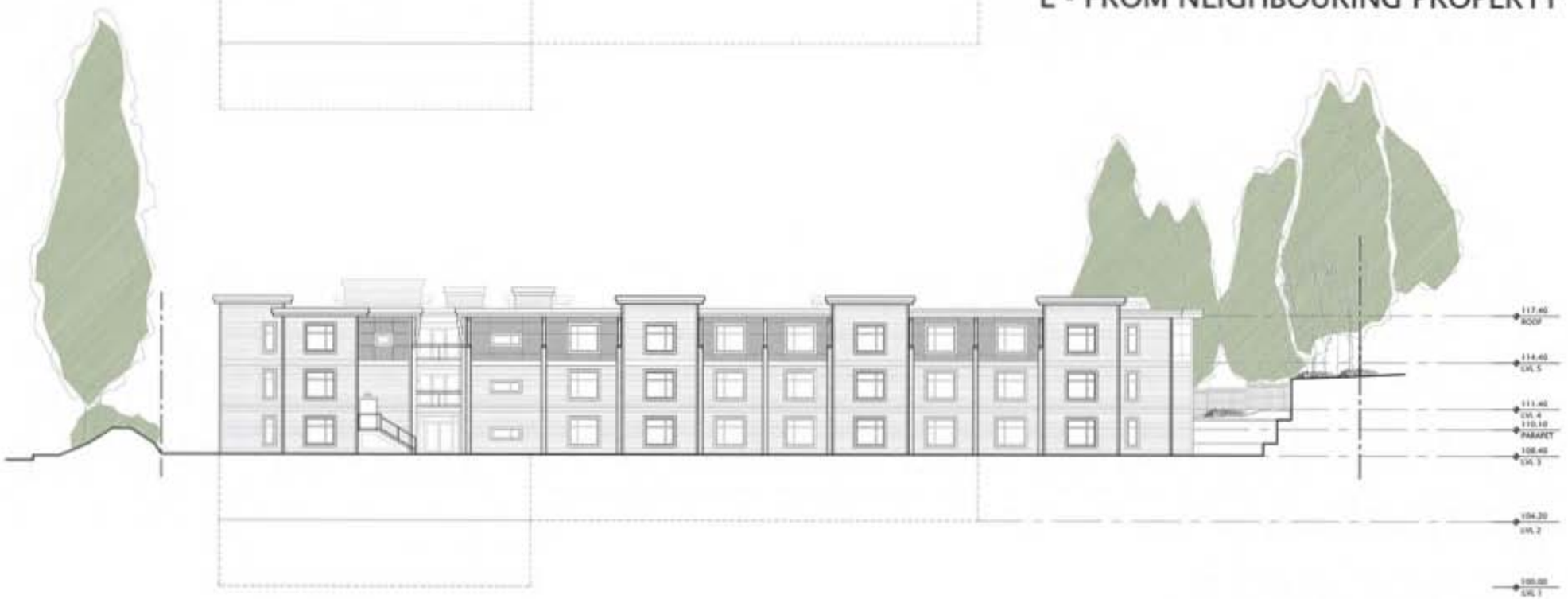
NORR ARCHITECTS PLANNERS

E - FROM NEIGHBOURING PROPERTY



F - FROM PROPERTY LINE

NORTH ELEVATIONS

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NORR ARCHITECTS PLANNERS

G - FROM ROAD

SOUTH ELEVATION

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NORR ARCHITECTS PLANNERS

COLOURED ELEVATIONS (EAST & WEST)

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NORR ARCHITECTS PLANNERS

SOUTH ELEVATION

NORTH ELEVATION

COLOURED ELEVATIONS (NORTH & SOUTH)

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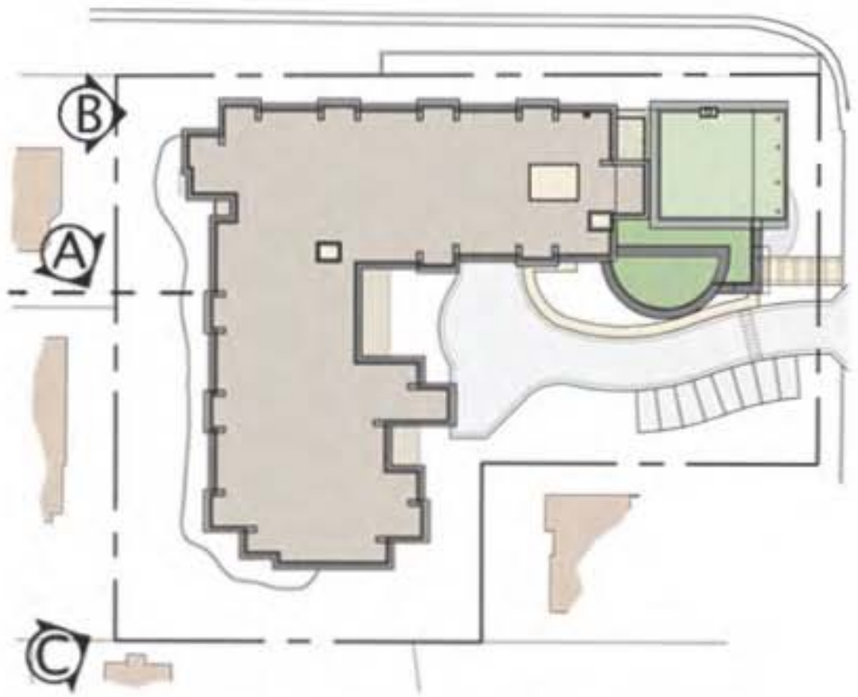
NORR ARCHITECTS PLANNERS



EDGE CONDITIONS - NORTH PROPERTY LINE

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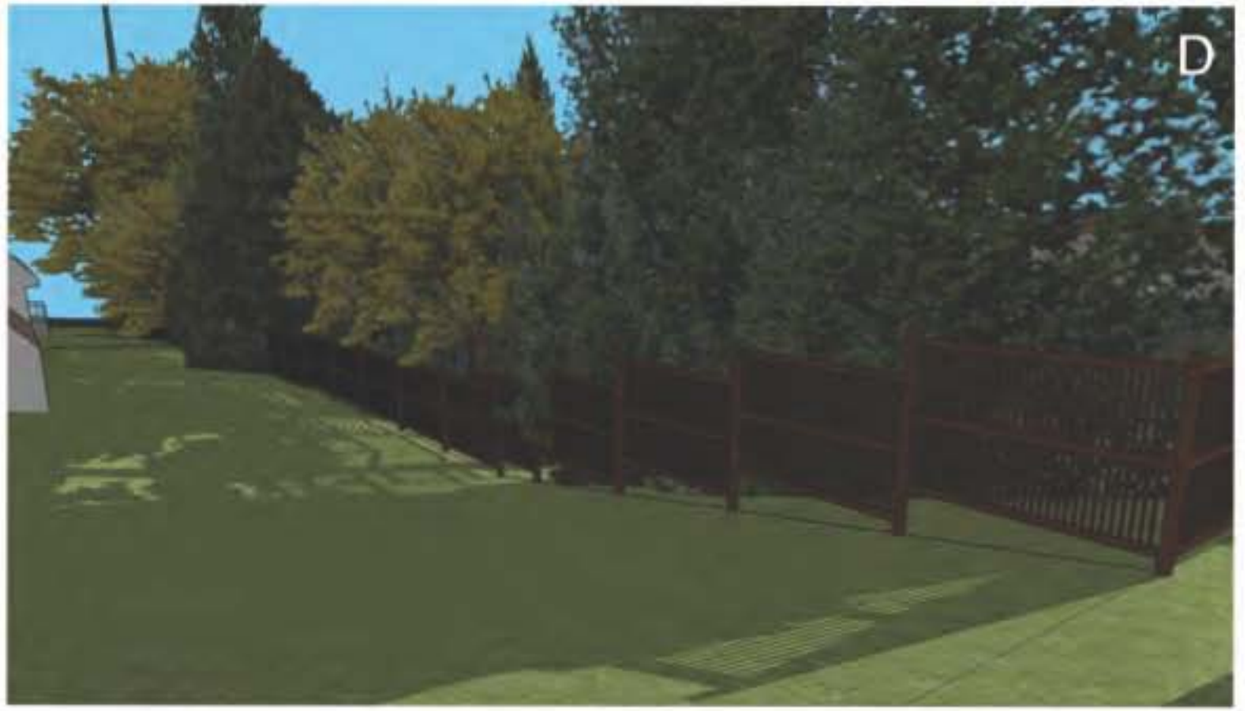
NORR ARCHITECTS PLANNERS



EDGE CONDITIONS - WEST PROPERTY LINE

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NORR ARCHITECTS PLANNERS

EDGE CONDITIONS - SOUTH PROPERTY LINE

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NORR ARCHITECTS PLANNERS

TREE MANAGEMENT PLAN

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NORR ARCHITECTS PLANNERS

LANDSCAPE PLAN

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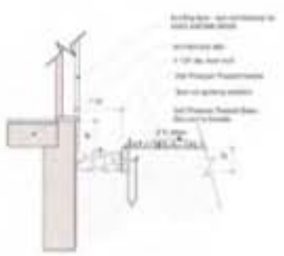
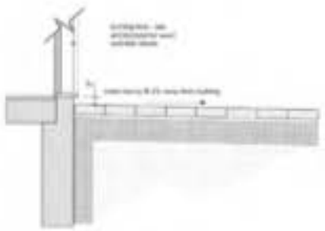
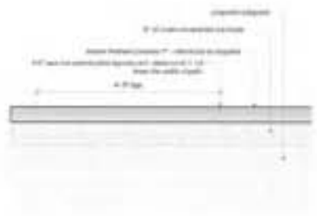
NORR ARCHITECTS PLANNERS



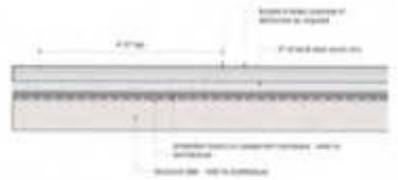
1 Detail: Typical Grid ring at building
Scale: 1" = 1'-0"



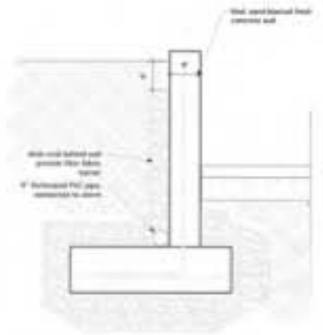
2 Detail: Typical Bioswale
Scale: 1" = 1'-0"



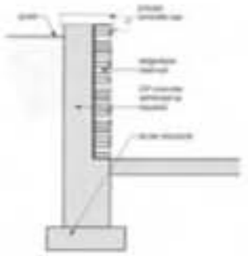
3 Detail: Typical Broom finish concrete on grade
Scale: 1" = 1'-0"



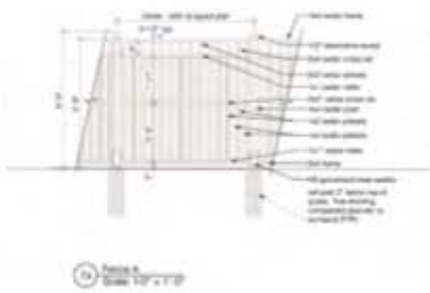
4 Detail: Concrete walkway on slab
Scale: 1" = 1'-0"



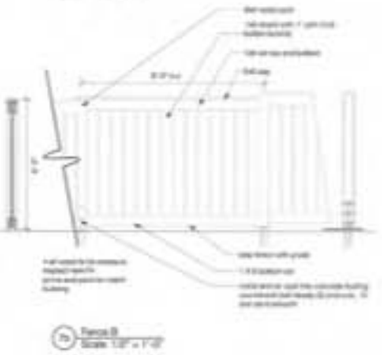
5 Detail: Typical Concrete Wall
Scale: 1" = 1'-0"



6 Detail: Typical Concrete Wall with snow facing
Scale: 1" = 1'-0"

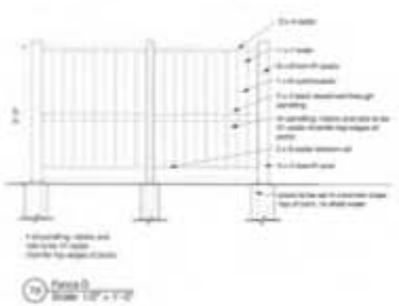


7a Fence A
Scale: 1/2" = 1'-0"



7b Fence B
Scale: 1/2" = 1'-0"

7c Fence C
Scale: 1/2" = 1'-0"



7d Fence D
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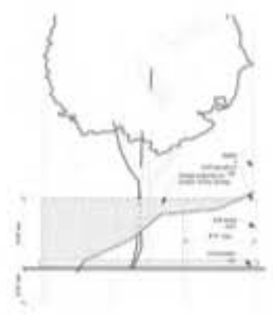
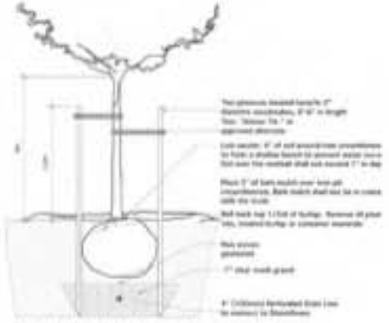
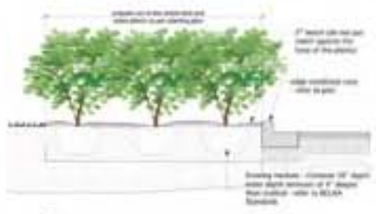


8 Detail: Tree protection fencing
Scale: 3/4" = 1'-0"

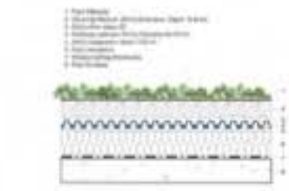


9 Detail: Tree Planting
Scale: 1/2" = 1'-0"

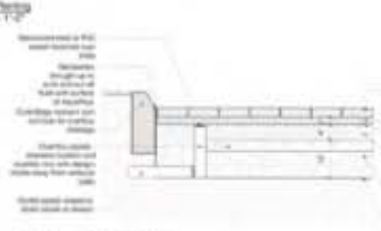


10 Detail: Shrub planting
Scale: 1/2" = 1'-0"

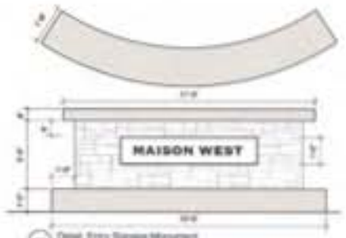
11 Detail: Rain Garden
Scale: 1/2" = 1'-0"



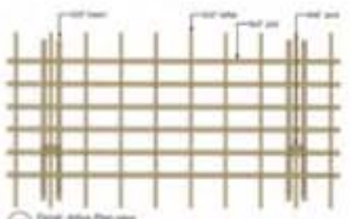
12 Detail: Extensive Greenroof System : ZinCo
Scale: 1" = 1'-0"



14 Permeable Vehicular Paving
Scale: 1" = 1'-0"



15 Detail: Entry Signage Monument
Scale: 1/2" = 1'-0"



16 Detail: Arbor Plan view
Scale: 1/2" = 1'-0"

16a Detail: Arbor Side view
Scale: 1/2" = 1'-0"

LANDSCAPE DETAILS

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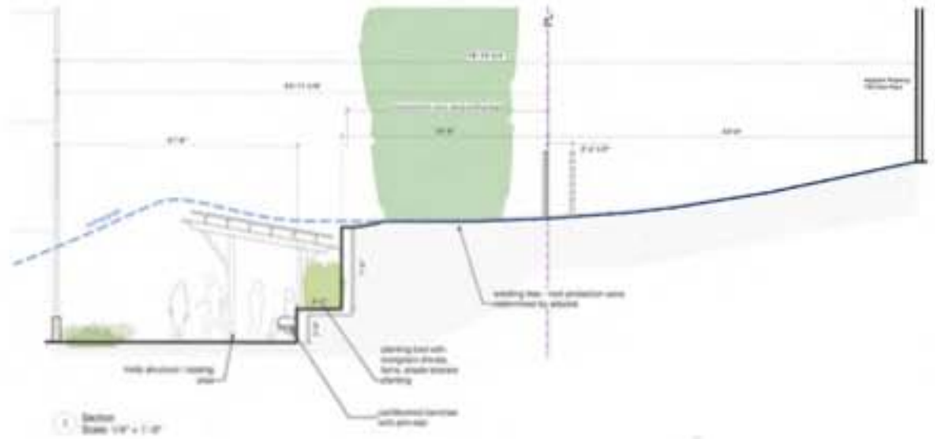
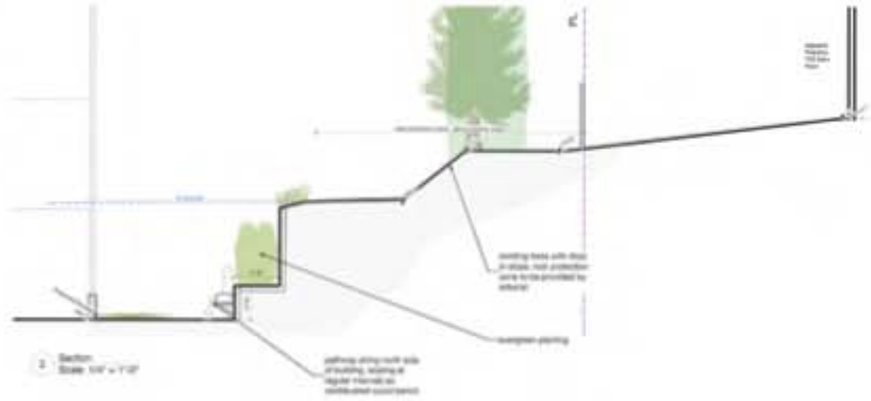
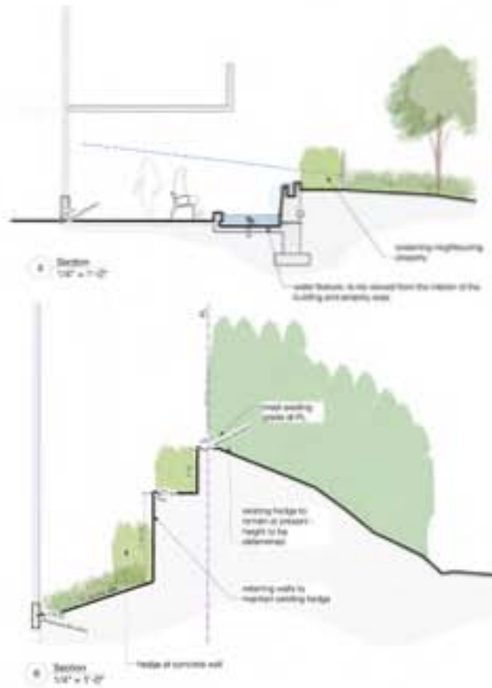
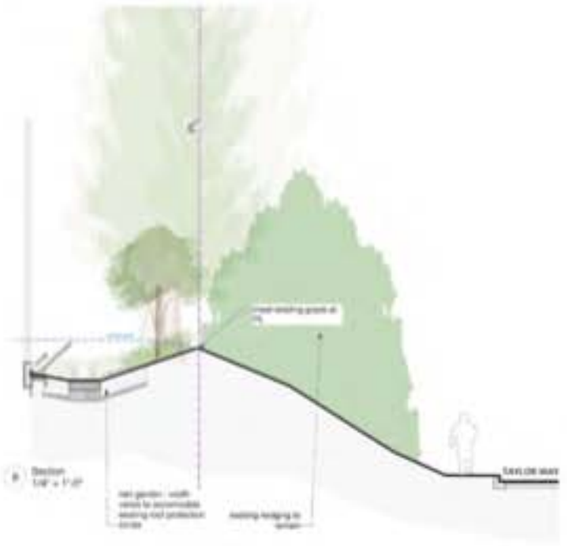
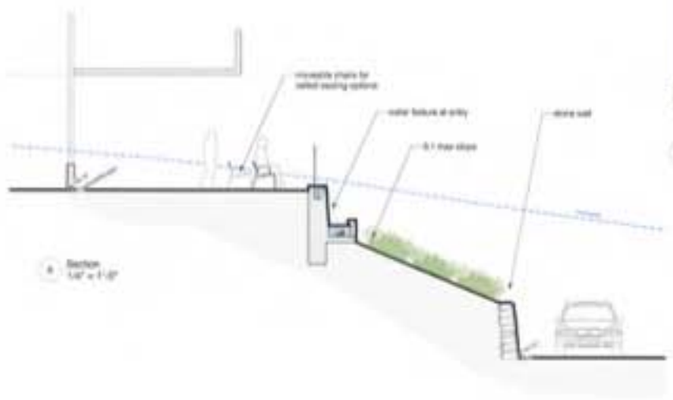
NORR ARCHITECTS PLANNERS

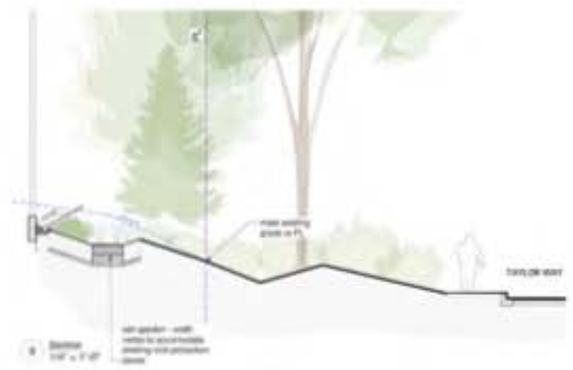












LANDSCAPE SECTIONS

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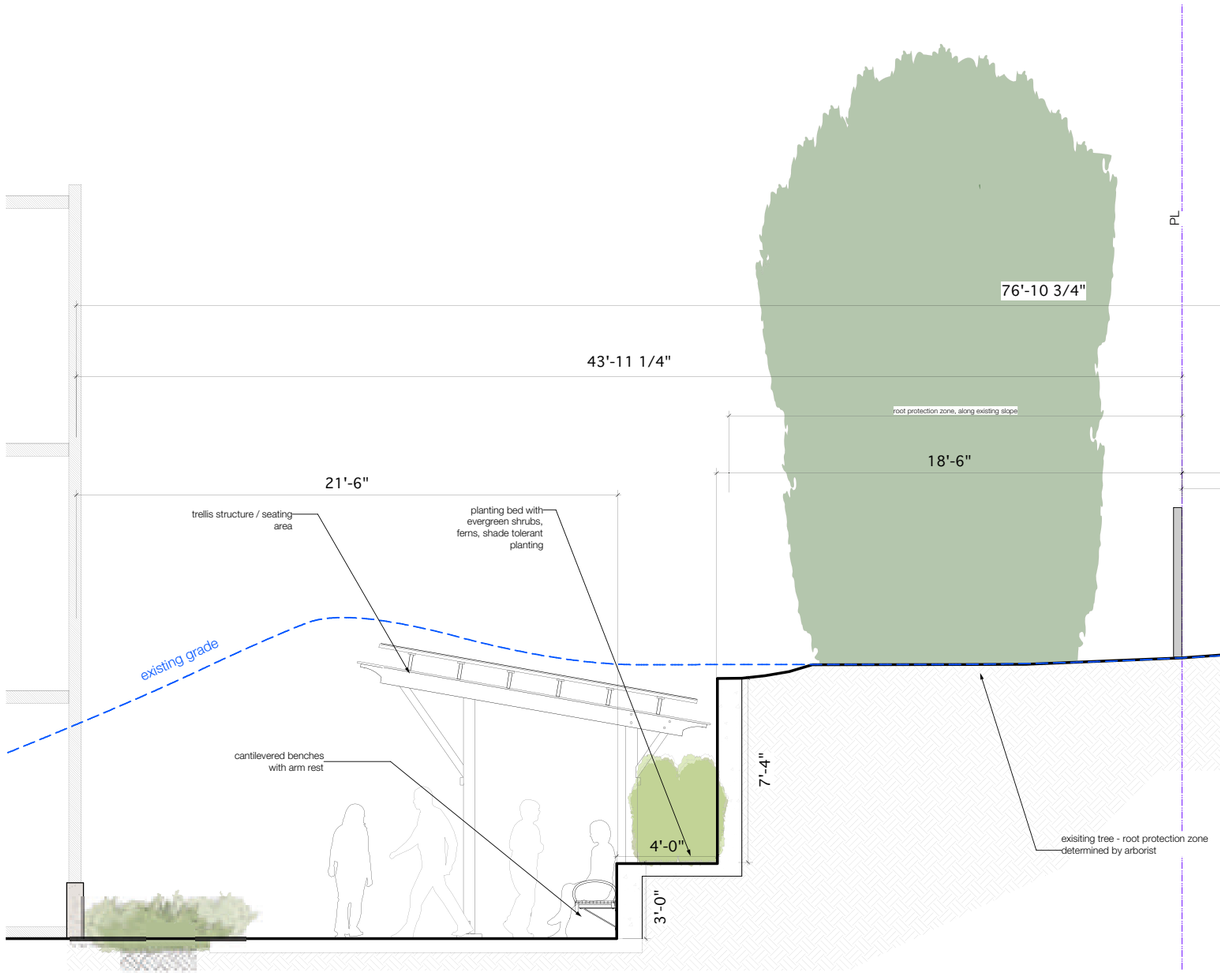
NORR ARCHITECTS PLANNERS



1 Section
Scale: 1/2" = 1'-0"

Revision
No. Date Revision Notes
1 8/20/13 DRC Comments

Issue
No. Date Issue Notes
A 12/10/12 Issued for review
B 12/13/12 Issued for Development Permit
C 2/26/13 Revisions to DP
D 8/20/13 DRC #2

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landscape architecture
1690 West 2nd Avenue
Vancouver , BC , Canada V6J 1H4
t | 683-1456
f | 683-1459
w | www.etasla.ca

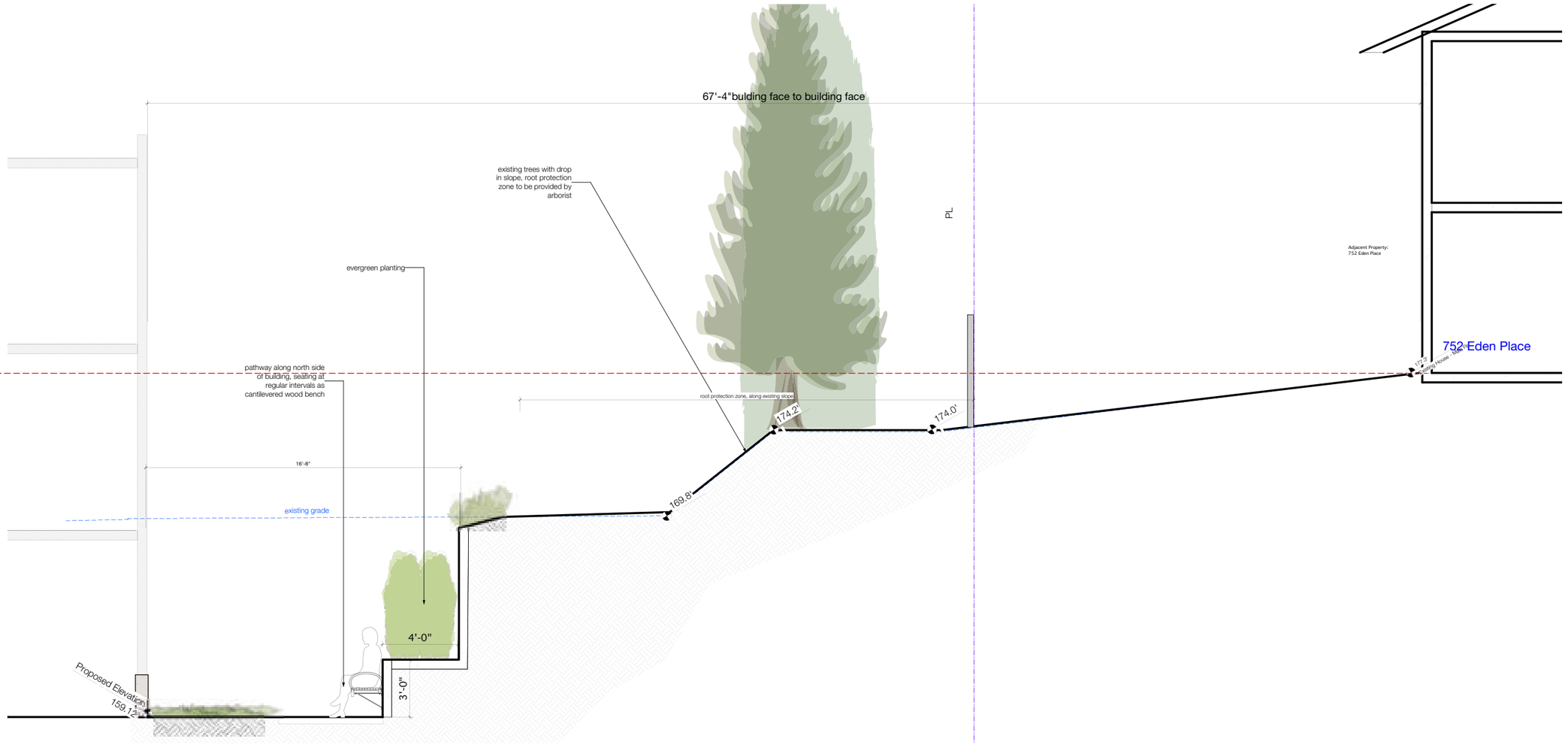
Project
Maison Senior Living
825 Taylor Way & 707 Keith Road
West Vancouver, BC

Drawing Title
Landscape Sections
536 Eden Place

Legal

Project Manager: GE	Project ID: 21249
Drawn By:	Scale:
Reviewed By:	Drawing No.: L4.1 of 5
Date: 11/20/12	

Plot Date:
9/19/13
21249 WVan Senior Res SECTIONS 09.12.2013.vwx



2 Section
Scale: 1/2" = 1'-0"

Revision

No.	Date	Revision Notes
1	8/20/13	DRC Comments

Issue

No.	Date	Issue Notes
A	12/10/12	Issued for review
B	12/13/12	Issued for Development Permit
C	2/26/13	Revisions to DP
D	8/20/13	DRC #2

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Project

Maison Senior Living

825 Taylor Way & 707 Keith Road
West Vancouver, BC

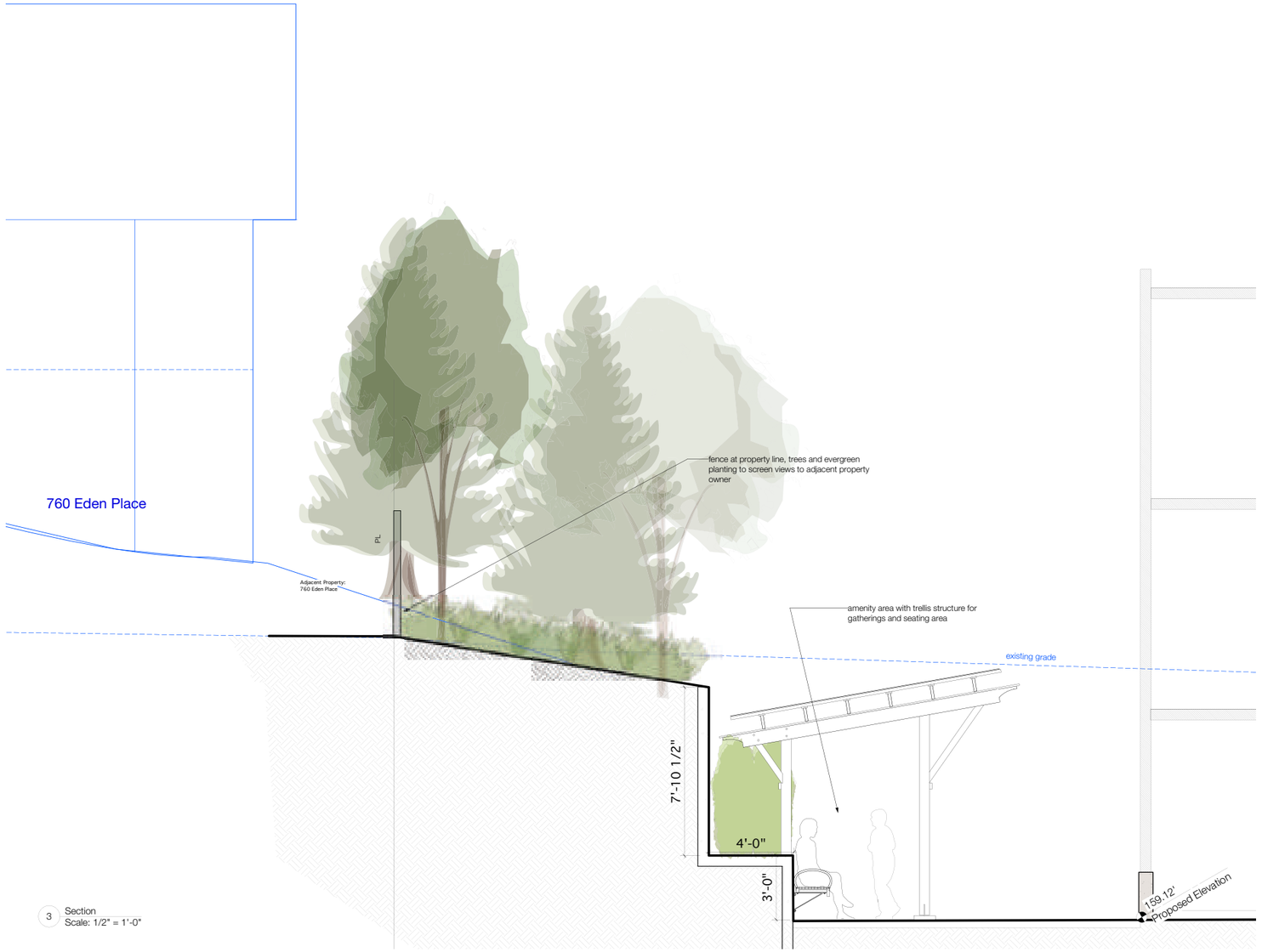
Drawing Title

Landscape Sections
752 Eden Place

Legal

Project Manager: GE	Project ID: 21249
Drawn By:	Scale:
Reviewed By:	Drawing No.: L4.2 of 5
Date: 11/20/12	

Plot Date:
9/19/13
21249 WVan Senior Res SECTIONS 09.12.2013.vwx



3 Section
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Revision

No.	Date	Revision Notes
1	8/20/13	DRC Comments

Issue

No.	Date	Issue Notes
A	12/10/12	Issued for review
B	12/13/12	Issued for Development Permit
C	2/28/13	Revisions to DP
D	8/20/13	DRC #2

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Project
Maison Senior Living
825 Taylor Way & 707 Keith Road
West Vancouver, BC

Drawing Title
Landscape Sections
760 Eden Place

Legal

Project Manager: GE	Project ID: 21249
Drawn By:	Scale:
Reviewed By:	Drawing No.: L4.3
Date: 11/20/12	5

Plot Date:
9/19/13
21249 WVan Senior Res SECTIONS 09.12.2013.vwx

TREE ASSESSMENT REPORT

825 Taylor Way & 707 Keith Rd, WV

Milliken Developments
Attn: Kate Milliken Binns
901 W 3rd Street, Ste #334
North Vancouver, BC
V7P 3P9

November 28, 2012

November 28, 2012

Milliken Developments
Attn: Kate Milliken Binns
901 W 3rd Street
North Vancouver, BC
V7P 3P9

RE: Arborist Report for trees at 825 Taylor Way & 707 Keith Road, WV

ASSIGNMENT

This report is in response to your request to assess the health of the trees located within the property boundaries of 825 Taylor Way and 707 Keith Road. A site survey with some preliminary plans was provided outlining the proposed development for these properties. The intent of this report is to determine the mode of tree protection that would be recommended to preserve some of the trees from any damage due to the proposed development at the above address. Also, to determine which trees would be candidates for removal based on their overall condition, the site plans indicating their proximity to the proposed development and the zones of heavy construction activities.

METHODOLGY

The inspection and assessment of the trees on the site has been conducted using generally accepted arboricultural practices for visual tree risk assessments. The visual inspection uses tools such as binoculars, mallet, clinometer, compass, diameter (DBH) tape and like tools. No invasive testing methods were used such as using an increment borer, resistograph or drilling. Additionally the TreeAZ Method for Managing Trees on Construction Sites created by Barrell Tree Consultancy in the UK was used in principle to assist with making these recommendations. TreeAZ is a framework of management practices and concepts to provide guidance for managing trees on construction sites.

OBSERVATIONS & DISCUSSIONS

Two site visits were conducted on November 17th and 19th to inventory, assess and document all the pertinent information relating to the trees on the site. There were more than 140 trees assessed for this report. They consist of Douglas fir (*Pseudotsuga menziesii*), Western Red Cedar (*Thuja plicata*), Broadleaf Maples (*Acer macrophyllia*), Vine Maple (*Acer circinatum*), Western Hemlock (*Tsuga heterophylla*) and a few additional landscape trees such as Saucer Magnolia (*Magnolia soulangiana*), Limber Pine (*Pinus flexilis*) and English Laurel (*Prunus laurocerasus*). The assessed trees have been indicated by a blue plastic numbered tag located in the lower 2.0 metres of the trunk or at the base.

There were no trees on the neighbouring properties that were noted as being within close proximity to the shared property lines or that would be expected to be impacted by the proposed construction work. The majority of the trees that are responsible for screening the properties from one another come from the trees located within the property boundaries of 825 Taylor Way. The tree species have been identified, their heights approximated, their overall condition and any observations are recorded and can be found within the attached

tree inventory document. The diameter of the trunks has been measured at 1.4 meters above grade (D.B.H). The tree inventory table is accompanied by a recommendations table and both documents are attached to this report.

One initial observation is that the entire site is on a gradually sloped grade that extends from the northwest corner of the property downward towards the southeast corner. There were no obvious soil failures, sloughing or recent disruption observed on the site. All of the trees within the assessed zone are of varying ages & sizes, and for the most part the essence of the landscape is that of an urban forest. There is lot of heavy growth within the understory which is comprised of native plants such as Western Sword Ferns (*Polystichum munitum*), Huckleberry (*Vaccinium parvifolium*), Salmonberry (*Rubus spectabilis*), Common Salal (*Gaultheria shallon*) and Elderberry (*Sambucus racemosa*) to name a few. There are however a number of non-native invasive species growing here as well such as English Ivy (*Hedera helix*), Blackberry (*Rubus armeniacus*) and Holly (*Ilex aquifolium*). These plants are considered to be highly invasive in our climate and should be managed over the long term to prevent and control their spread. All of the trees are growing on a substrate that appears to be comprised of nurse logs/stumps or old forest material.

Picture 1. Aerial View of Property showing location of tagged trees

The majority of these trees are located with the property boundaries of 825 Taylor Way and almost all of them have been previously topped at some point in past. This can occur by natural means (breakage by snow load or a bird sitting on a terminal branch) or by mechanical means (cutting the top off which is an antiquated practice) which is more likely the case on this site. The multiple stems that result from the topping generally have weak attachments and are more susceptible to failure at these attachment points. Consequently, trees that are previously topped generally have a high probability of decay within the tree. This also contributes to the high probability of stem failure if the canopy or top of the tree far outweighs what the lower decayed stems can bear. As the trees grow and the shoots increase in weight, the branches of a topped tree become susceptible to breaking off during storms, heavy winds, snow or precipitation loads.

As well, a number of the trees have also been 'windowed' or 'window pruned' for view. This creates a situation where the trees are heavy in the upper crowns and are likely to fail during a high wind condition. Windowed trees have a significantly increased probability of trunk failure or 'windthrow' due to the bending point being directly under the upper canopy. *Windthrow* refers to trees uprooted or broken by wind. The risk of windthrow to a tree is related to the tree's size (height and diameter), the 'sail affect' presented by its crown, the stability and anchorage provided by its roots, its exposure to the wind, and cultural conditions such as soil water, local wind climate, degree of slope etc.

Picture 2. Previous topping

Picture 3. Previous topping

Picture 4. Stem failure in previously topped tree

There are a number of trees that have grown with a lean in the stem which is characteristic of a phototropic response. This result may occur for a number of reasons that could include other trees having been located beside or nearby a tree during much of its growth period or as a result of the dense canopy the sub-dominant trees would grow to reach up for the light. *Phototropism* is a physiological growth response that plants have adapted themselves to be able to grow in the direction of its light source. It is also important to note that a phototropic lean is not an indication of or representative of a potential failure.

It is important to acknowledge that approximately 40% of the assessed trees are noted as being Western Hemlocks (*Tsuga heterophylla*). The Western Hemlock is native to the west coast and usually grows with many different tree species as part of a larger stand. They have shallow rooting habits which makes them susceptible to being blown over by the wind as well as being damaged by forest fires. It is also very characteristic of them to grow in nurse log/stump material. This also increases their probability of windthrow once the nurse material has decayed and gives way to voids beneath the root plate. They can tolerate shaded environments and usually grow underneath mature trees. Hemlocks are also highly susceptible to a number of fungal pathogens that affect their roots and or butts, and their trunks; for example Armillaria Root Rot (*Armillaria mellea*), Annosum Root Rot (*Heterobasidion annosum*) and White Trunk Rot (*Phellinus hartigii*) to name a few.

It was also observed that the root flares are either buried or partially buried on most of these trees. This is likely the result of the natural accumulation on the forest floor over time. There were also many of the trees that had structural roots visible at the surface and a few of them exhibited girdling roots near their bases. Girdling roots grow across or perpendicular to the radial placement of roots. This can pose problems for some trees the more mature they get. They can survive for many years with girdled roots but eventually the girdling will cause 'choking off' of a buttress or structural root causing decline and possible death for the tree. For the most part their buttress roots appear to have developed to compensate for the growing conditions on this site and the varying terrain. Therefore they are considered to have an atypical placement of their roots however the vast majorities appear to have adapted well. There was one tree noted as having experienced a partial root failure as a result of growing on a rock or nurse log where either there was insufficient soil for root anchorage or natural decay of the nurse log caused the tree to go over. It does not pose a high risk at this time as it remains a juvenile however it is not likely to be a long term landscape investment on this site the more mature it gets.

A *Nurse Log* is defined as a larger and decomposing fallen log or stump which acts as a germination substrate for tree species establishing in the understory in a forested environment. Such logs provide moisture, nutrients and often some degree of elevation above other potentially competing vegetation on the forest floor. However, through natural decomposition processes the nurse log breaks down over time and voids are created beneath the trees which increases the probability of root plate failures because of the atypically placement of the structural roots which tend to wrap around the nurse log.

Picture 5. Buried root flares and girdling roots

Picture 6. One tree experienced a root failure

Picture 7. Lots of nurse logs/stumps on site

Picture 8. Lots of nurse logs/stumps on site

A few of these trees have be left as living stumps or wildlife snags allowing nature to take its course. *Wildlife trees* are defined as any standing dead or living tree with special characteristics that provide habitat for wildlife. They are an invaluable component in the forest ecosystem. According to the Ministry of Forests, Lands and Natural Resource Operations, there are found to be over 70 species of vertebrates and invertebrates that are dependent of the wildlife trees, for example birds, bats, insects, fungi, mychorrhizae etc.

Picture 9. Active Wildlife snag

The trees are varying in their trunk taper ranging from low to moderate. This is to be expected or is typical in densely populated or forested areas. Tapered trunks will withstand greater stress (*wind, vandals, snow load etc*) than those that have little to no taper. Tapered trunks also allow for a more uniform distribution of the stress that will be imposed on the tree. The taper in a tree trunk decreases in diameter the higher up the tree you go. Mechanically the tops of well-tapered trunks are more apt to bend under the wind further from the vertical than those with less taper. This reduces the danger of broken trunks or other deformation from exposure to the heavy winds.

Many of these trees are also considered to have low to moderate live crown ratio and only a few were noted as having high live crown. *Live Crown Ratio* is defined as the ratio of the vertical extent of the live crown, compared to the overall height of the tree. Some of the trees are exhibiting a moderate to heavy cone crops in their canopies. Excessive coning can

be an indicator of stress but the amount of cones present is not considered alarming. It is also important to note that the new foliage and buds that are visible appear to be fairly evenly distributed throughout the canopies. There are a few trees that are showing some signs or evidence of chlorosis with a yellowing or brownish hue to foliage when viewed from a distance. *Chlorosis* is a condition in which leaves produce insufficient chlorophyll. Chlorophyll is responsible for absorbing light energy in plants and therefore, is responsible for the green colour in a leaf. Chlorotic leaves are generally pale or yellow.

It is also important to note that these trees have been growing in this location for some time and are well established. It is reasonable to expect that as a result of this, all of these trees are working together to some degree to sustain the forces of nature that act upon them. For example, their root systems are likely intertwined, their branches over lap and grow into one another and for all intents and purposes, a stand of trees acts like a team and works together, to a certain degree, which makes them more formidable as a group than a 'stand alone' tree.

Overall the trees are considered to be in fair or marginal condition. There are lots of trees on this site and for the most part they have not been well maintained. In some cases a thorough inspection of the tree trunks was not possible because the Ivy has been allowed to grow up onto them. With the site visits having occurred at a time of year where all of the deciduous trees had already defoliated for winter dormancy the assessment of any health related issues that tend to present themselves in the leaves was not able to be observed. There were no visible fungal conks or outward signs of root decay evident on the assessed trees. There is no apparent indication of shifting or heaving in the root plates at the time to site visit was conducted.

RECOMMENDATIONS:

1. There are a number of trees recommended for removal that are either in marginal condition; or are deemed to have a high probability of failure for varying reasons; and or fall within or within close proximity to the proposed building footprint of the development. Please refer to the attached Recommendations Table accompanying this report for further information on these trees and the Removal and Retention Plan (Figure 1 & 2) which can be found on page 14.
2. Protection zones for any of the retained trees that are deemed to be within close proximity to the building footprint or to the zone of heavy construction activities should be constructed to delineate a zone around the trees with fencing to prevent encroachment of equipment as well as prevent items from being stored within the root zones or up against the trees. The fencing should be high enough (1.2 metres (4 ft)) to deter anyone from entering the root zones. Signage should be placed on the fencing to convey to workers the purpose for the fence. Wooden frame and orange poly fencing or equivalent is suitable for this application. Please refer to Appendix 'B' for further information. The tree protection is to remain in place for the duration of the construction activities until there is no further possibility that the trunks and root zones will be damaged. Care must be taken when construction activities occur within or within close proximity to the Critical Root Zone (CRZ) of any tree. As this site poses unique challenges, adaptations to the protection zones may be

required. The tree protection zones have been determined based on site findings, the plans that were provided and in consideration of the CRZ criteria. Please refer to Appendix 'A' for further information on the impact to trees by construction. The Tree Protection Zones are outlined in the attached Recommendations Table accompanying this report and the Tree Protection Plan noted as Figure 3 and 4 on page 15.

3. Additional protection of the roots from construction compaction is recommended in areas where heavy construction or foot traffic flow will occur. Additional root protection can be achieved by using a number of methods that include but are not limited to a thick layer of wood chips (15 to 20 cm in depth) that is replenished as required to maintain the thickness; ¾-inch plywood joined together to create a pathway; scaffolding and or a combination thereof. The objective is to assist in spreading the load to prevent damage or compaction to the soil in the CRZs. Therefore *all parties* must be made aware of and follow the recommended protocol to preserve the retained trees and minimize the impact of the construction on them. ***Please note*** clean wood chips may be obtained by contacting a local tree service company to have a number of loads of wood chips dumped for use at the site or leaving some chips on site from the site trees that were removed.
4. Removing the existing asphalt driveway near trees #617 through #623 and the shed near trees #605 through #607 must be done with extreme care and attention as these trees are intended for retention. It is reasonable to expect that due to the length of time that the trees have been growing in close proximity to the shed foundation and the driveway, that the trees' roots may have embedded themselves in the underside of the slab or asphalt. Using a jack hammer (manually or as an attachment on a small piece of equipment) to break up the concrete/asphalt and carefully remove it from the area to ensure that any of structural or feeder roots that have found their way beneath the existing slab/asphalt are not damaged by breakage or tearing. Thus, the foundation/driveway and the roots may need to be "teased" apart. **Do Not Use small excavating equipment with a toothed bucket attachment to break up and collect the concrete or asphalt.**
5. If encroachment is required into the CRZ of any of these trees, for example, to install a footing for a retaining wall or pathway, it is strongly recommended to conduct the required excavation by use of an AirSpade® or like equipment such as HydroVac. An *AirSpade®* is an air excavation tool that when attached to a compressor uses a high velocity of air to blow soils away from roots without damaging them. This is a widely used tool within the arboriculture & horticulture communities as well as within utility & construction, environmental remediation, trench rescues & demining of unexploded ordnance. The excavation & any subsequent root pruning, is to be conducted by or under the direct supervision/instruction of a qualified Certified Arborist.
6. A qualified Certified Arborist **must be** on-site during the periods of excavation that fall within the prescribed root protection area to observe, assess and ensure the integrity of the CRZ is maintained and conduct or supervise any subsequent root pruning (if required). Additional notes for trees #617, #618 and #671 can be found within the attached Recommendations Table.

7. If installation of any utilities, or pipes required for water service, drainage, electricity etc, are to be installed within, or cross sect the CRZ, then it is strongly recommended to reconsider their placement. If this is not plausible, then items like these must be installed by tunneling beneath the roots by using an AirSpade® or HydroVac to ensure that there are no structural roots severed or damaged during their installation as well as attempting to maintain as many viable feeder roots as possible.
8. If there is any time lapse between the excavation and or the construction of the retaining walls or building foundation, then a Shotcrete application or like stabilization technique may be required to stabilize the soil in and around the areas of the retained trees to ensure that no undermining of the soil occurs beneath the root plates of the trees.
9. It is recommended to maintain the existing grade within the CRZ of the retained trees. Changing the grade around these trees proposed for retention could possibly change the water table and the sites drainage creating other problems such as standing water, anaerobic soil conditions & or root rot etc. It would be discouraged to change the grade by importing fill to level out an area around a retained tree.
10. If there are areas where new stumps need removal for the purposes of construction or landscape installation and they are located within close proximity to or within the CRZ of any other retained trees, then it is strongly recommended to have the stumps ground out versus excavated out with an excavator. Stump grinding will isolate the removal to the stump itself and not compromise the integrity of the structural roots which may be intertwined with other nearby trees. Excavators are generally hard working pieces of equipment that can aggressively and efficiently move large volumes of material. That is to say that the removal of stumps by excavators can dislodge; damage and or compromise the integrity of the structural roots of any retained trees located nearby the stumps proposed for removal.
11. If the construction work is to occur during a drought period, for example, summer time, then thorough watering of the trees to keep the soil moistened is recommended. ***This could be completed during non-construction-work hours.*** Ensuring that the trees are adequately watered through this period will help reduce the impact of the stress being imposed on the trees during the construction activities. Setting up a temporary irrigation system by use of soaker hoses or sprinklers, supply lines and attached back to the closest hose bib with a battery operated timer is recommended to achieve this, if possible. A discussion with the neighbouring properties as to their ability to assist with this is recommended as it is a reasonable option for the trees adjacent to the shared property lines.
12. Conducting pruning to remove any dead or damaged scaffold branches, to re-top and shape any previously topped trees, and to remove any dead tree tops is recommended. This or any safety pruning is recommended to be completed prior to the construction activities commencing. Conducting an aerial inspection to visually assess and inspect the crowns and the previous topping points, noting or reporting any defects or concerns is recommended to be conducted at the same time. This work is to be conducted by or under the direct supervision/instruction of a qualified Certified Arborist.
13. Pruning of the remaining trees to raise the canopy slightly or to address clearance issues; to conduct structural pruning; to mitigate any risks of failure in the co-

dominant stems by either re-topping & shaping or subordinating the co-dominant stems & installing a supplemental support system is reasonable. In the arboriculture community, the American National Standard Institute (ANSI) and the ISA Best Management Practices are used to set guidelines to prevent over pruning of trees. It is generally recommended that no more than 25% to 30% of the overall live canopy be removed at any one given pruning cycle. That is to say that all pruning (combined) on a tree including but not limited to canopy raising; end weight reduction; clearance for overhang to the structures, subordination of competing leaders etc should not exceed 25% - 30% of the overall live canopy that is removed. This is a generally expected and accepted practice for qualified Certified Arborists and reputable tree service companies. The only exception would be when mitigating measures are required to reduce the risk and probability of failure in a tree or tree stems which, in some cases, requires removal of more than the recommended 30%. Proper pruning practices must be adhered to and this work is to be conducted by or under the direct supervision/instruction of a qualified Certified Arborist.

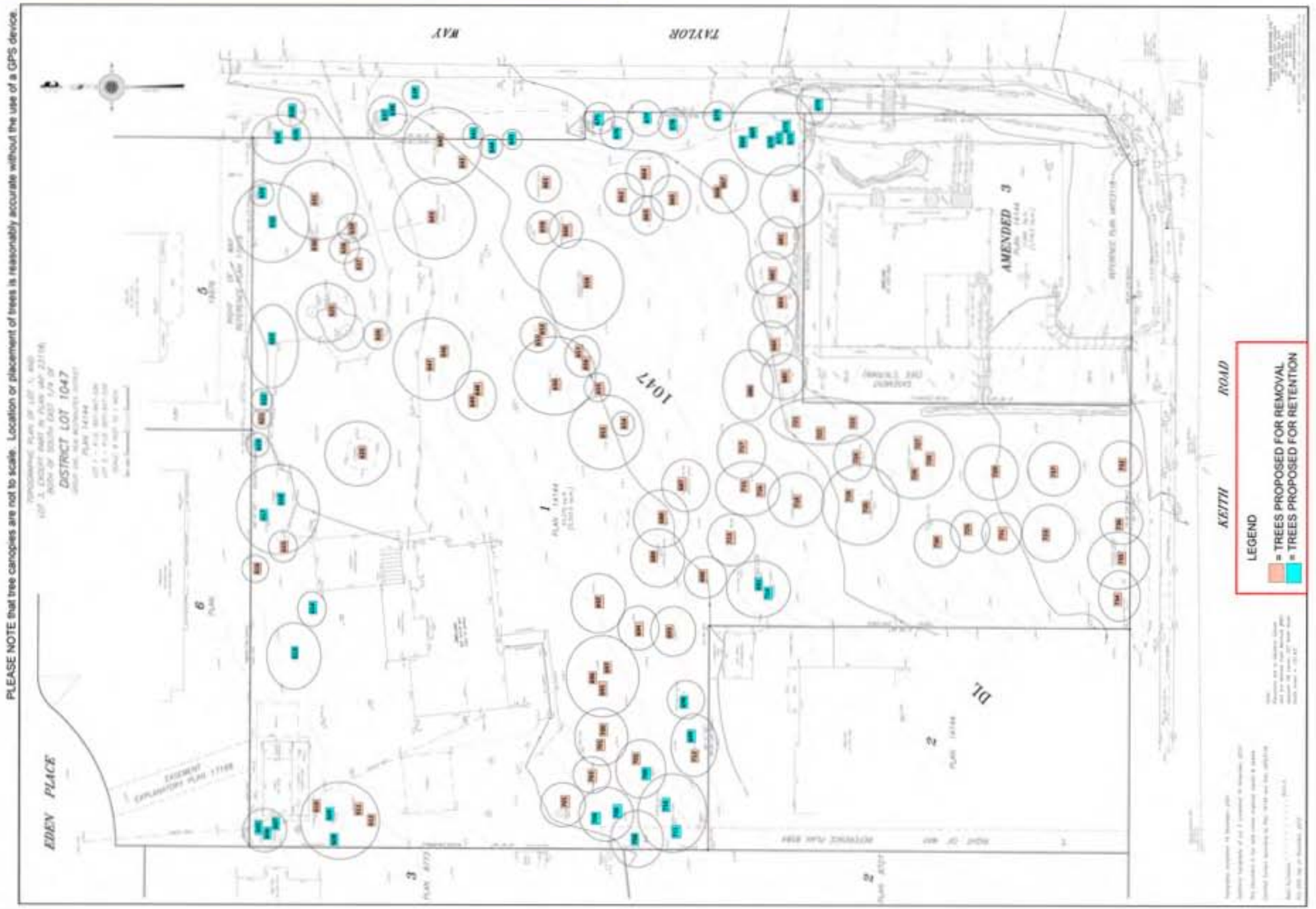
14. If it is determined that subordinating the competing leaders and installing a supplemental support system is the preferred method to mitigate any risks, then it should only be installed, inspected and evaluated by a qualified Certified Arborist. The cable support system would require regular inspections overtime. An inspection should occur at one year after its initial installation to ensure that it is working correctly. Subsequent inspections can be executed by devising an inspection schedule that follows the manufacturer's recommendations of inspecting that type of cable/brace support system selected and observing the useful life of the system which can range from 5 to 15 yrs. The installation of the cable system must be executed in accordance to the standards and specifications set out by American National Standards Institute - ANSI A300 Part 3 (2006) - Supplemental Support Systems, the ISA Best Management Practices for Tree Support Systems, and the manufacturer's recommendations.
15. A soil analysis and sub-surface prescription fertilizer applications, to maintain soil fertility and the retained trees' overall health, before, during and after construction, is recommended. Trees are often highly impacted by disruption within their CRZ due to construction activities thus implementing a prescription fertilizer program to help bolster the trees' health and natural defenses is recommended if the intent is to preserve the health and longevity of these trees.
16. Monitoring the trees during and post construction is to be executed by a qualified Certified Arborist to ensure that all aspects of their preservation are being adhered to and properly addressed. Site visits to document the progress and observe the trees may be required through the duration of the project and beyond completion.
17. It is recommended to conduct some root invigoration, soil remediation (mixing in organic matter) and compaction relief within the root zones of some of the retained trees post construction and prior to some of the landscape installation. Use of an Air Spade® or like equipment to ensure that there is minimal root damage in the critical root zone during the aeration process is strongly recommended. Mulching up to 5 – 7.5 cm (2 – 3 inches) in depth to improve overall tree health is recommended. Aerating the surrounding soil around the trees with the use of the Air Spade®, post construction, will reduce some of the potential for damage and stress that can be

caused by the compaction of the roots. Amending the soil with organic matter will improve the soil aeration and create more conducive conditions to help counteract the impact on the root system. This will, in turn, improve the overall health and longevity of the trees.

18. The installation of the replacement plants should be executed in accordance with the specifications set out by the BC Landscape Standards (7th Edition) for proper planting practices. This includes but is not limited to the following items such as exposing the root flare prior to planting, planting it at a proper depth, watering in the plant once it's been installed, staking and mulching etc.
19. Any new plant material (trees & any other plants included) requires care in the first 2 to 3 growing seasons until they get established. It is important to note that newly planted trees rely on the moisture held within their root balls until they can get their roots out and established. This may take a few seasons therefore it is important to ensure that the root ball ***does not dry out*** even if the soil around it is moist, the root ball could still be dry. It is important that from time to time to get in there and check with your hands. Regular and thorough watering to any new plant material is required for the success of the new plantings. It is recommended to have an automated underground irrigation system installed to address the watering needs. It is also important to note that even if an automated system is in place, that there may be cause to provide additional or supplemental water to certain areas or plants. **One option** is to use soaker hoses to direct water directly to the root zone of the new plant. The soaker hose(s) can be attached to a supply hose directed to the closest hose bib and attached a battery operated timer to assist with watering within the guidelines provided through the GVRD Water Conservation Practices. The **second option** would be to manually provide water or use a tree watering bag which has been known to be available at Home Depot, Rona or Lee Valley Tools.
20. Organic mulch should be placed around the base of any newly planted trees within the critical root zone. This promotes moisture retention in the soil and helps reduce the establishment of competing weeds or grass. Do not place the mulch up against the tree itself, place it several inches away. Mulching at approximately 5 cm – 7.5 cm coverage over the entire root system area to improve overall tree health is recommended. The mulching should be spread out over the critical root zone and not placed right up against the trunk.
21. Removal of the Ivy that is growing up onto the trunks of the retained trees is strongly recommended. Managing or controlling the Ivy to deter it from growing up into the trees is important to prevent it from further spreading. As well it is difficult to monitor defects or conduct thorough inspections of the tree trunks if they are covered in Ivy.
22. No vehicles, equipment or construction materials or like items are to be stored within the CRZ of these trees.
23. It is recommended to control or remove the Ivy that is growing up into the trees that are proposed for retention.
24. **Turf is not recommended** to be installed as part of the landscape within the root zone of any tree.

milliken DEVELOPMENTS Perfectly Urban

NORR ARCHITECTS PLANNERS



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NORR ARCHITECTS PLANNERS

CONCLUSION:

In conclusion, this is a unique property. It is heavily treed with lots of mature trees and unfortunately they have not been well maintained for their entire growth period. The overall condition of the trees is considered to be either fair or marginal however efforts are being made to retain a number of trees to maintain some screening and privacy to the neighbouring properties, and to incorporate large, mature trees into the overall landscape plan. All efforts will be made to keep any trees that are **reasonable to retain** based on their species, the location and function on the site and their overall condition.

The primary concern is the overall long term health and safety for the trees and for those living around them. Care must be taken when working around these large mature trees and in order to preserve them, it is important to understand that mature trees are much less adaptable to site changes that occur during or are associated with construction. Care must be taken when construction activities occur close to or within the root zone of any tree. A tree protection zone is required for the retained trees that fall within close proximity to or are just outside the zone of the heaviest construction activities (Fig 3 & 4 on pg 15). The protection fencing is to remain in place for the duration of the construction until there is no further possibility of damage.

All parties must keep in focus that the goal is to ***minimize the overall impact*** of the construction activities on these trees. Thus, any work or activities conducted during the course of the construction ***must be*** done with the overall long term preservation of the trees in mind as some are intended for retention. Conducting a soil analysis and implementing a prescription fertilizer program will assist in promoting improved and optimal health, and maintain the vitality of the trees.

The recommendations noted above are acceptable to achieve the balance of reducing the overall impact of the construction on the retained trees, acknowledging their preservation over the long term, and achieving the proper specifications for the construction and soil retention. Site visits by a qualified Certified Arborist at different stages of construction is recommended to ensure that the protocols and temporary measures to preserve the retained trees are being adhered to. ***The recommendations have been made based on the site findings and may be subject to change based on any further information that arises or any additional findings that are uncovered after this report is submitted.***

It is important to note that there are many different factors causing stress to trees. For example, imposed stress could be things such as environmental factors like climate change to cultural conditions such as soil compaction or mechanical damage to the roots, but is likely to be a combination of factors. Trees play an important role in the urban ecology, and all of us must be stewards to ensure a tree's survival and our own safety.

RADIX TREE & LANDSCAPE CONSULTING

Testing and Analysis:

The assessment completed on the trees defined within this report, consisted of a visual and physical inspection from the ground and was based upon the principals of Visual Tree Assessments. No invasive tests, such as using a resist-o-graph or increment borer, where used during the testing for this report.

Assumptions and Limiting Conditions:

1. The information contained in this report covers only those items that were examined and reflect the condition of these items at the time of inspection. The inspection is limited to visual examination of accessible components without dissection, excavation or probing. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the trees or property in question may not arise in the future.
2. The opinions in this Report are given based upon observations made using generally accepted professional judgment, however, because trees and plants are living organisms and subject to change, damage and disease, the results, observations, recommendations, and analysis as set out in this Report are valid only as at the date any such testing, observations and analysis took place. No guarantee, warranty, representation or opinion is offered or made by Radix Tree and Landscape Consulting as to the length of the validity of the results, observations, recommendations and analysis contained within this Report.
3. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the appraiser/company can neither guarantee nor be responsible for the accuracy of information provided by others.
4. All tree work is to be completed under the supervision of an ISA Certified Arborist and in compliance with ISA, BC Hydro and WCB standards.
5. Alteration of any part of this report invalidates the entire report.

If you have any questions or concerns please feel free to contact us.

Sincerely yours,

Michelle McEwen
ISA Certified Arborist (PN-6707A)
Certified Tree Risk Assessor (544)
Wildlife/Danger Tree Assessor BC (P-1453)
CofQ #00317-LH-08
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APPENDIX 'A'

IMPACT OF CONSTRUCTION ON TREES

BACKGROUND OF APPROACH

A tree's decline and mortality on construction sites results primarily from damage to the root system. During construction, roots are frequently cut when installing foundations, water, sewer lines or other utilities, driveways, curbs, sidewalks etc. Many roots are also lost when soil is removed during grading. Fine absorbing roots occur primarily within the top 6 to 8 inches of soil. Removing just a few inches of soil during grading can result in the elimination of many of these roots. Loss of fine roots will reduce water and nutrient absorption which will eventually lead to decline. Cutting larger roots could compromise stability and increase the probability of failure.

Compaction of the soil or placing fill over a tree root system during grading is equally as destructive. All plant cells, including those in the roots, require oxygen to survive. Root cells obtain oxygen from the pores space in the soil. When the soil over the root systems is compacted, or fill soil is added during construction, the amount of soil air is greatly reduced. At the same time, gases toxic to plant roots tend to accumulate in the soil. These adverse factors result in root mortality and tree decline.

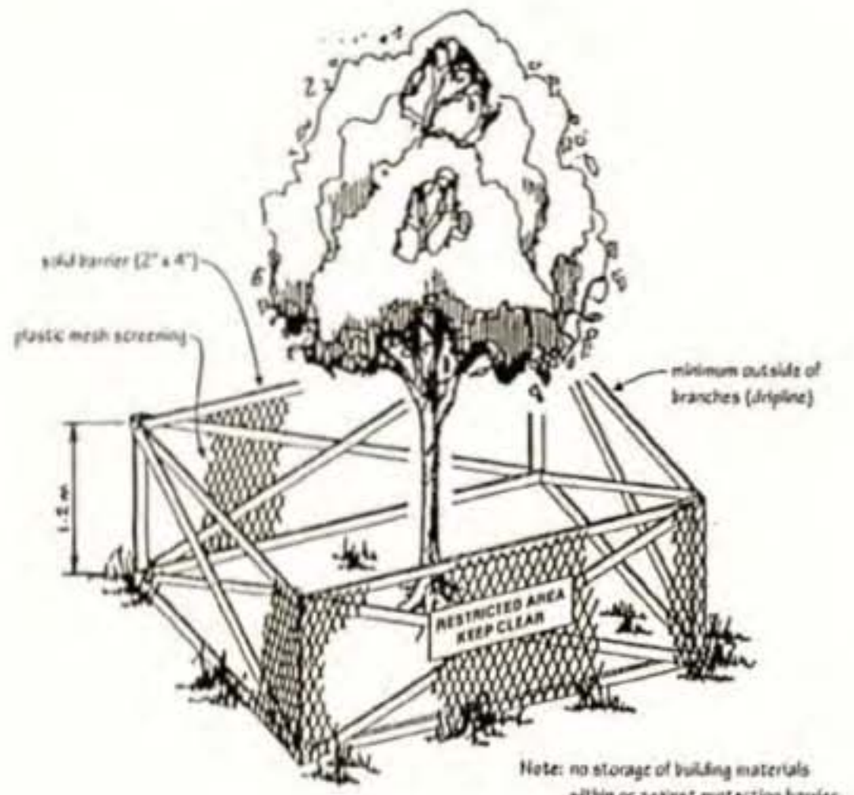
Mechanical injuries to the stems and limbs also contribute to tree decline. Bark injuries inhibit transport of water and nutrients to the crown and allow entrance of decay and other disease organisms. Storing of supplies and materials within the root zone and soil contamination due to spills of materials such as fuel etc will also damage the root system.

The Critical Root Zone (CRZ) is the area of soil around the tree where the majority of the roots are located. The roots within this area provide stability and are responsible for the uptake of water and nutrients to maintain tree health. Any level of compaction limits root growth due to lack of available oxygen.

The stress of compaction and low soil fertility, coupled with other physical, environmental and human forces acting against these trees, it is reasonable to expect that the Critical Root Zones of these trees will be impacted, to some degree, due to the proposed construction activity that will occur near the trees. Providing protection for the trees is recommended to reduce any impact to the trees and their root systems.

APPENDIX 'B'

TREE PROTECTION BARRIERS FOR TREES



Tree Protection Barrier

TREE INVENTORY

825 Taylor Way & 707 Keith Rd, WV

Milliken Developments
Attn: Kate Milliken Binns
901 W 3rd Street, Ste #334
North Vancouver, BC
V7P 3P9

November 28, 2012

Suite #264, 718-333 Brooksbank Ave, North Vancouver, BC V7J 3V8
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Radix

Tree Inventory
825 Taylor Way & 707 Keith Rd, WV

28-Nov-12

Tree Tag #	Species	DBH (cm)	Ht (m)	Canopy Radius (m)	Observations
605	Vine Maple - *Acer circinatum*	15	7.6	3.0	**Fair** - adjacent to north property line at northwest corner; phototropic lean to the north; growing on a burm; buried flare; heavily pruned to provide clearance to service lines to the north; smaller Vine Maple located nearby; falls outside the proposed building footprint & zone of heavy construction activites
606	Western Hemlock - *Tsuga heterphylla*	35	21.3	5.0	**Fair** - adjacent to northwest property line at northwest corner; growing on a burm; not previously topped; balanced canopy; partially buried flare; moderate trunk taper; moderate to high live crown ratio; heavy cone crop; ivy growing up onto stem; phototropic lean to the southeast; falls outside the proposed building footprint & zone of heavy construction activites
607	Western Hemlock - *Tsuga heterphylla*	31.5	21.3	4.5	**Fair** - adjacent to northwest property line at northwest corner; growing on a burm; not previously topped; balanced canopy; partially buried flare; buttress roots adapted like growing on nurse stump; moderate to low trunk taper; moderate live crown ratio; heavy cone crop; falls outside the proposed building footprint & zone of heavy construction activites
608	Bigleaf Maple - *Acer macrophyllum*	7 to 25	10.7	4.0	**Fair** - adjacent to northwest property line near existing shed; growing on a nurse stump mound adjacent to property line; multi-stemmed; canopy weighted to west; partially buried flare; falls outside the proposed building footprint & zone of heavy construction activites
609	Western Hemlock - *Tsuga heterphylla*	35.5	18.3	3.0	**Fair** - adjacent to northwest property line near existing shed; growing on a nurse stump mound; not previously topped; partially buried flare; buttress roots adapted like growing on nurse stump; low trunk taper; moderate to low live crown ratio; heavy to excessive cone crop; 3 to 4 smaller trees growing within grouping; falls outside the proposed building footprint & zone of heavy construction activites
610	Western Hemlock - *Tsuga heterphylla*	39	18.3	n/a	**Dead** - adjacent to northwest property line near existing shed at 825 Taylor Way; recently dead; recent broken top; moderate trunk taper; heavy cone crop still persisting in canopy; falls outside the proposed building footprint & zone of heavy construction activites

611	Western Hemlock - *Tsuga heterphylla*	17.5	18.3	3.0	**Poor** - adjacent to northwest property line near existing shed at 825 Taylor Way; growing on a nurse stump mound; appears to be in an advanced stage of decline; not previously topped; buried root flare; low trunk taper; low live crown ratio; heavy to excessive cone crop; orange fungal bodies visible on lower trunk; falls outside the proposed building footprint & zone of heavy construction activites
612	Bigleaf Maple - *Acer macrophyllum*	18	21.3	5.0	**Fair** - adjacent to northwest property line near garden area; growing on a nurse stump mound; multi-stemmed; not previously topped; buried root flare; buttress roots adapted like growing on nurse stump; phototropic lean to the south; falls outside the proposed building footprint & zone of heavy construction activites
613	Saucer Magnolia - *Magnolia soulangiana*	23 & 24	21.3	5.0	**Fair** - adjacent to north property line approx 5.0 m south of existing fence; multi-stemmed; phototropic lean to the south; previously topped at 6.1 m; buried root flare; dead scaffold & broken branches; falls outside the proposed building footprint & within close proximity to zone of heavy construction activites
614	Limber Pine - *Pinus flexilis* cvs	10	3.6	2.0	**Fair** - located within garden bed just north of covered entrance at north side of house; minor interior foliage senescence; phototropic lean to the southwest; large girdling stuctural root at north side; falls outside the proposed building footprint & within close proximity to zone of heavy construction activites
615	Bigleaf Maple - *Acer macrophyllum*	24	13.7	3.5	**Fair** - located east of #614 & approx 3.5 m south of existing fence line; dead scaffolds; buried root flare; growing from under canopy of #617; phototropic lean to the southwest; canopy weighted to the west; falls outside the proposed building footprint & within close proximity to zone of heavy construction activites
616	Apple - *Malus sp*	19.5	6.1	2.5	**Fair to Poor** - adjacent to existing fence along north property line; deadwood; buried root flare; growing from under canopy of #617; phototropic lean to the west; canopy weighted to the west; girdling roots visible; falls outside the proposed building footprint & zone of heavy construction activites
617	Western Red Cedar - *Thuja plicata*	100	21.3	5.5	**Fair** - adjacent to north property line in raised planting area 1.2 m above driveway; previously topped at 12.2 m; co-dominant stems have grown; phototropic lean to the northwest; canopy weighted to northwest; dead scaffold branches; high live crown ratio; good trunk taper; partially buried root flare; girdling roots visible at southeast side; minor chlorosis in foliage; heavy cone crop; ivy growing onto stem; lots of reaction wood giving trunk a 'muscular' appearance; falls outside the proposed building footprint & zone of heavy construction activites

618	Western Red Cedar - *Thuja plicata*	96	15.2	5.5	**Fair** - adjacent to north property line in raised planting area 1.2 m above driveway; previously topped at 12.2 m; co-dominant stems have grown; phototropic lean to the southwest; balanced canopy; dead scaffold branches; high live crown ratio; good trunk taper; heavy cone crop; buried root flare; ivy growing onto stem; lots of reaction wood giving trunk a 'muscular' appearance; falls outside the proposed building footprint & within close proximity to zone of heavy construction activites
619	Vine Maple - *Acer circinatum*	10 & 20	7.6	4.5	**Fair** - adjacent to north property line in raised planting area 1.2 m above driveway & east of #617; phototropic lean to the east; canopy weighted to east; dead scaffold branches; ivy growing onto stem to 6.1 m; buried root flare; heavily pruned for clearance; falls outside the proposed building footprint & zone of heavy construction activites
620	Western Red Cedar - *Thuja plicata*	70	21.3	5.0	**Fair** - located in raised planting area 60 cm high in middle of driveway; previously topped at 12.2 m; co-dominant stems have grown; phototropic lean to the southwest; balanced canopy; dead scaffold branches; high live crown ratio; moderate trunk taper; moderate cone crop; buried root flare; lots of reaction wood giving trunk a 'muscular' appearance; electrical for outdoor lighting affixed on trunk of tree; falls within proposed building footprint & within the zone of heavy construction activites
621	Western Hemlock - *Tsuga heterphylla*	40.5	18.3	3.5	**Fair** - adjacent to north property fence line; phototropic lean to the northeast; previously topped at 13.7 m; buried root flare; low live crown ratio; low trunk taper; deadwood; heavy cone crop; falls outside the proposed building footprint & zone of heavy construction activites
622	Holly - *Ilex aquifolium*	17.5	7.6	2.0	**Fair** - adjacent to north property line approx 2.0 m from fence line; phototropic lean to the south; balanced; dead branches in lower canopy; buried root flare; pruned for clearance vehicles in driveway; minor leaf blight; falls outside the proposed building footprint & zone of heavy construction activites
623	English Laurel - *Prunus laurocerasus*	19 to 25	9.1	5.5	**Fair** - Grouping of five mature Laurel; phototropic lean varying directions; dense canopy; falls outside the proposed building footprint & zone of heavy construction activites
624	broken tag				
625	Western Hemlock - *Tsuga heterphylla*	75	21.3	4.5	**Fair** - located north of driveway growing on a nurse stump mound; phototropic lean to the south; previously topped at 12.2 m; balanced canopy; deadwood; partially buried root flare; moderate trunk taper; moderate live crown ratio; moderate cone crop; reaction wood ridges visible on bole; falls outside the proposed building footprint & within close proximity to zone of heavy construction activites
626	Western Hemlock - *Tsuga heterphylla*	23.5	9.1	3.5	**Fair** - located adjacent to driveway at north side growing on a nurse stump mound; phototropic lean to the south; previously topped at 3.7 m; co-dominant stems have grown; canopy weighted to south; deadwood; buried root flare; low trunk taper; low live crown ratio; moderate cone crop; falls outside the proposed building footprint & within the zone of heavy construction activites

627	Western Hemlock - *Tsuga heterphylla*	22.5	15.2	3.0	**Fair** - located north of driveway; previously topped at 3.0 m; co-dominant stems have grown; canopy weighted to south; deadwood; bulge & defect visible at base; buried root flare; low trunk taper; low live crown ratio; moderate cone crop; falls outside the proposed building footprint & within close proximity to zone of heavy construction activites
628	Western Hemlock - *Tsuga heterphylla*	26.5	21.3	3.0	**Fair** - located north of driveway growing on a nurse log; previously topped at 3.7 m; co-dominant stems have grown; canopy weighted to south; deadwood; buried root flare; low trunk taper; moderate live crown ratio; moderate cone crop; falls outside the proposed building footprint & within close proximity to zone of heavy construction activites
629	Western Red Cedar - *Thuja plicata*	34	16.8	3.5	**Fair** - located north of driveway growing on a nurse log; previously topped at 3.7 m; co-dominant stems have grown; canopy weighted to south; deadwood; partially buried root flare; moderate trunk taper; moderate to low live crown ratio; moderate cone crop; falls outside the proposed building footprint & within close proximity to zone of heavy construction activites
630	Douglas fir - *Pseudotsuga menziesii*	75	4.6	n/a	**Fair** - Wildlife snag; phototropic lean to the southeast; nesting cavities visible throughout length of bole; falls outside the proposed building footprint & zone of heavy construction activites
631	Western Red Cedar - *Thuja plicata*	86	24.4	6.0	**Fair** - located north of driveway; previously topped at 12.2 m; co-dominant stems have grown; balanced canopy; deadwood; partially buried root flare; good trunk taper; high live crown ratio; moderate cone crop; reaction wood giving trunk a "muscular" appearance; falls outside the proposed building footprint & zone of heavy construction activites
632	Bigleaf Maple - *Acer macrophyllum*	40 & 48	18.3	6.0	**Fair** - located north of driveway approx 2.0 m south of fence line; multi-stemmed; ridge of included bark at base of stem union; canopy weighted to the north; dead scaffold branches; buried root flare; reaction wood formation of a bulge in lower 2.0 m of stem; falls outside the proposed building footprint & zone of heavy construction activites
633	Vine Maple - *Acer circinatum*	8 & 10	6.1	3.0	**Fair** - adjacent to north fence line; multi-stemmed; phototropic lean to the north; canopy weighted to the north; deadwood; buried root flare; falls outside the proposed building footprint & zone of heavy construction activites
634	Western Hemlock - *Tsuga heterphylla*	61	30.5	5.0	**Fair** - located north of driveway growing on a nurse stump; buttress roots have adapted to growing location; balanced canopy; moderate trunk taper; moderate live crown ratio; falls outside the proposed building footprint & zone of heavy construction activites
635	Western Red Cedar - *Thuja plicata*	18	13.7	2.5	**Fair** - located north of driveway growing on a nurse mound; buttress roots have adapted to growing location; canopy weighted to south; low trunk taper; low live crown ratio; partially buried root flare; falls outside the proposed building footprint & zone of heavy construction activites

636	Cypress - *Chamaecyparis* sp	35 & 29	10.7	2.5	**Fair** - located north of driveway; previously topped at 3.0 m; canopy weighted to west; moderate trunk taper; low live crown ratio; partially buried root flare; falls outside the proposed building footprint & zone of heavy construction activites
637	Western Red Cedar - *Thuja plicata*	23	9.1	2.5	**Fair** - located south of driveway growing on a nurse mound at crest of slope; not previously topped; buttress roots have adapted to growing location; canopy weighted to east; low trunk taper; low live crown ratio; partially buried root flare; live stump from Tulip tree growing in same location; falls outside the proposed building footprint & within close proximity to zone of heavy construction activites & truck access
638	Western Hemlock - *Tsuga heterphylla*	15 & 17	9.1	2.5	**Fair** - located south of driveway growing on a nurse mound at crest of slope; not previously topped; multi-stemmed; included bark at base of stem union; buttress roots have adapted to growing location; canopy weighted to east; low trunk taper; low live crown ratio; partially buried root flare; live stump from Tulip tree growing in same location; falls outside the proposed building footprint & within close proximity to zone of heavy construction activites & truck access
639	Western Hemlock - *Tsuga heterphylla*	25	10.7	3.0	**Fair** - located on sloped grade above pedestrian walkway adjacent to east property line; not previously topped; canopy weighted to east; moderate trunk taper; moderate live crown ratio; partially buried root flare; falls outside the proposed building footprint & zone of heavy construction activites
640	Bigleaf Maple - *Acer macrophyllum*	105	19.8	6.0	**Fair to Poor** - located adjacent to east property line above crest of slope; not previously topped; short trunked; stem failure visible in upper canopy; decay cavity visible on failed stem; phototropic lean to the east; girdling root visible at east side; canopy weighted to east; buried root flare; dead scaffold branches; falls outside the proposed building footprint & zone of heavy construction activites
641	Western Hemlock - *Tsuga heterphylla*	33	15.2	4.0	**Fair** - located adjacent to east property line above crest of slope; previously topped at 3.0 m; phototropic lean to the east; canopy weighted to east; buried root flare; dead scaffold branches; 4 to 5 juvenile Bigleaf Maples growing within immediate area; moderate trunk taper; low live crown ratio; falls outside the proposed building footprint & zone of heavy construction activites
642	Western Red Cedar - *Thuja plicata*	16	12.2	3.0	**Fair** - located adjacent to east property line above crest of slope; not previously topped; phototropic lean to the west; canopy weighted to west; buried root flare; dead scaffold branches; low trunk taper; low live crown ratio; falls outside the proposed building footprint & zone of heavy construction activites
643	Western Hemlock - *Tsuga heterphylla*	89	30.5	5.5	**Fair** - located south of driveway; not previously topped; balanced canopy; moderate trunk taper; moderate live crown ratio; buried root flare; live stump from Bigleaf Maple tree growing just to south of location; ivy growing on stem to 3.7 m & remnants to 10.7 m; electrical wiring for driveway lighting affixed to tree; falls within proposed building footprint & within zone of heavy construction activites

644	Pacific Dogwood - *Cornus nuttallii*	15	9.1	3.0	**Fair** - located adjacent to east property line; buried root flare; deadwood throughout canopy; phototropic lean to southeast; falls outside the proposed building footprint & zone of heavy construction activites
645	Douglas fir - *Pseudotsuga menziesii*	19	12.2	3.0	**Fair** - located adjacent to east property line above crest of slope; subordinate within stand; previously topped at 3.0 m; canopy weighted to east; buried root flare; dead scaffold branches; low trunk taper; low live crown ratio; falls outside the proposed building footprint & zone of heavy construction activites
646	Western Hemlock - *Tsuga heterphylla*	31.5	12.2	3.0	**Fair** - located south of driveway growing on a nurse mound; subordinate within stand; not previously topped; buttress roots have adapted to growing location; low trunk taper; high live crown ratio; growing within CRZ of #647; falls within proposed building footprint & within zone of heavy construction activites
647	Bigleaf Maple - *Acer macrophyllum*	102	19.8	5.5	**Fair** - located south of driveway growing on a nurse mound; cavity visible beneath tree at northwest side; buried root flare; dead scaffold branches throughout canopy; falls within proposed building footprint & within zone of heavy construction activites
648	Western Hemlock - *Tsuga heterphylla*	17	9.1	2.5	**Fair** - located south of driveway exiting south to Keith Rd; growing on a nurse mound; subordinate within stand; not previously topped; buttress roots have adapted to growing location; phototropic lean to the east; low trunk taper; high live crown ratio; falls withn proposed building footprint & within zone of heavy construction activites
649	Bigleaf Maple - *Acer macrophyllum*	17	9.1	3.5	**Fair** - located adjacent to driveway exiting south to Keith Rd; phototropic lean to the west; canopy weighted to west; previously topped at 3.0 m; falls within proposed building footprint & within zone of heavy construction activites
650	Bigleaf Maple - *Acer macrophyllum*	76	18.3	6.0	**Fair** - growing on a nurse mound; previously topped at 12.2; phototropic lean to the northwest; partially buried flare; dead scaffold branches; previously topped at 3.0 m; a number of small juvenile trees growing beneath canopy approx 10 -15 cm dbh; falls within proposed building footprint & within zone of heavy construction activites
651	Western Hemlock - *Tsuga heterphylla*	24.5	15.2	3.0	**Fair** - growing on a nurse mound directly east of #650; previously topped at 3.0 m; canopy weighted to north; exposed root flare; moderate live crown ratio; low trunk taper; low cone crop; falls within proposed building footprint & within zone of heavy construction activites
652	Western Hemlock - *Tsuga heterphylla*	20	15.2	3.0	**Fair** - growing on a nurse mound directly east of #650; previously topped at 3.0 m; exposed root flare; canopy weighted to east; moderate live crown ratio; low trunk taper; low cone crop; falls within proposed building footprint & within zone of heavy construction activites

653	Tulip Tree - *Liriodendron tulipifera*	78	21.3	5.0	**Fair** - located adjacent to driveway exiting south to Keith Rd; previously topped at 6.1 m; co-dominant stems have grown; partially buried flare; large burl at approx 1.0 m above grade; depressions visible in stem; falls within proposed building footprint & within zone of heavy construction activites
654	Western Hemlock - *Tsuga heterphylla*	21	6.1	3.0	**Fair** - located adjacent to driveway exiting south to Keith Rd growing on nurse log; canopy weighted to south; phototropic lean to the south; low trunk taper; moderate live crown ratio; low cone crop; falls within proposed building footprint & within zone of heavy construction activites
655	Western Hemlock - *Tsuga heterphylla*	21.5	12.2	3.0	**Fair** - growing on nurse stump; canopy weighted to north; phototropic lean to the west; deadwood; previously topped at 3.0 m; structural roots visible at surface; low trunk taper; low live crown ratio; low cone crop; sap sucker activity; bulge in lower stem at 1.5 to 3.0 m; falls within proposed building footprint & within zone of heavy construction activites
656	Western Red Cedar - *Thuja plicata*	42	12.2	3.0	**Fair** - located to the southeast of #650; canopy weighted to north; previously topped at 3.0 m; low trunk taper; low live crown ratio; low cone crop; sap sucker activity; old wound that has compartmentalized; falls within proposed building footprint & within zone of heavy construction activites
657	Western Hemlock - *Tsuga heterphylla*	27	12.2	3.0	**Fair** - just to the south of #651; buried root flare; canopy weighted to south; moderate live crown ratio; low trunk taper; low cone crop; falls within proposed building footprint & within zone of heavy construction activites
658	Western Red Cedar - *Thuja plicata*	125	18.3	5.0	**Fair** - tagged with Chapman Survey #1974; in line with #681 just west of chimney; previously topped at 7.6 m; co-dominant stems have grown; included bark at stem union; canopy weighted to south; decay cavity visible at base of tree; partially buried root flare; phototropic lean to the southwest; girdling roots visible; reaction wood giving trunk a 'muscular' appearance; decayed logs and stumps strewn through the immediate area
659	Western Hemlock - *Tsuga heterphylla*	22	12.2	3.0	**Fair** - located directly to the east of #658 and in line with #652; canopy weighted to north; low trunk taper; moderate live crown ratio; defect at approx at 1.5 m; deadwood in lower canopy; buried root flare; phototropic lean to the northwest
660	Western Hemlock - *Tsuga heterphylla*	41.5	18.3	4.0	**Fair** - located directly to the east of #658 and directly south to #659 and in line with #657; canopy weighted to southeast; low trunk taper; moderate live crown ratio; previously topped at 3.0 m; co-dominant stems have grown; buried root flare; deadwood in lower canopy; falls within proposed building footprint & within zone of heavy construction activites

661	Western Hemlock - *Tsuga heterphylla*	52	18.3	5.0	**Fair** - located above a swale just in from Marine Dr; just south of DF #645; Chapman Survey tag #1975; soil very organic and soft underfoot; not previously topped; balanced canopy; high live crown ratio; moderate trunk taper; reaction wood giving trunk a "muscular" appearance; a number of juvenile Vine Maples growing in immediate area; falls within proposed building footprint & within zone of heavy construction activites
662	Bigleaf Maple - *Acer macrophyllum*	10 to 12	12.2	4.0	**Fair** - located to the southeast of #660; multi-stemmed; previously topped at 1.0 m; canopy weighted to south; buried flare; dead scaffold branches; decay cavities visible; a number of small juvenile trees growing in immediate area; falls within proposed building footprint & within zone of heavy construction activites
663	Bigleaf Maple - *Acer macrophyllum*	10 to 20	12.2	5.0	**Fair** - located directly to the south of #660; multi-stemmed; previously topped at 1.0 m; gnarled old strunk; partially buried flare; dead scaffold branches; decay cavities visible; lots of brambles growing in immediate area; falls within proposed building footprint & within zone of heavy construction activites
664	Cherry - *Prunus emarginata*	20	10.7	3.0	**Fair** - located west of #675; phototropic lean to the southeast; partially buried flare; dead scaffold branches; lots of brambles growing in immediate area; falls within proposed building footprint & within zone of heavy construction activites
665	Bigleaf Maple - *Acer macrophyllum*	7 to 15	10.7	3.0	**Fair** - located to the south of #664; multi-stemmed; previously topped at 1.0 m; buried flare; dead & broken scaffold branches; a number of small juvenile trees growing in immediate area; falls within proposed building footprint & within zone of heavy construction activites
666	Western Hemlock - *Tsuga heterphylla*	16	7.6	3.0	**Fair** - located near the southeast corner of the property; growing on a nurse mound; located to the south of #664; previously topped at 3.0 m; buried root flare; dead & broken scaffold branches; canopy weighted to west; low trunk taper; low live crown ratio; falls outside the proposed building footprint & within close proximity to zone of heavy construction activites
667	Western Hemlock - *Tsuga heterphylla*	19.5	12.2	2.5	**Fair** - located near the southeast corner of property; growing on a nurse mound; located to the east of #666; previously topped at 3.0 m; buried root flare; dead & broken scaffold branches; canopy weighted to west and isolated to top; low trunk taper; low live crown ratio; group of juvenile Vine Maples growing nearby; falls outside the proposed building footprint & within close proximity to zone of heavy construction activites
668	Western Hemlock - *Tsuga heterphylla*	21.5	15.2	3.0	**Fair** - located at southeast corner of property at the crest of a burm; low trunk taper; low live crown ratio; canopy weighted to north; buried root flare; falls outside the proposed building footprint & zone of heavy construction activites
669	Pacific Dogwood - *Cornus nuttallii*	21	12.2	4.0	**Fair** - located at southeast corner of property at the crest of a burm; phtolean to the east; buried root flare; falls outside the proposed building footprint & zone of heavy construction activites

670	Western Hemlock - *Tsuga heterphylla*	19	12.2	3.5	**Fair** - located at southeast corner of the 825 Taylor Way at the crest of a burm; growing at north side of #671; low trunk taper; low live crown ratio; canopy weighted to northeast; buried root flare; falls outside the proposed building footprint & zone of heavy construction activites
671	Western Red Cedar - *Thuja plicata*	150	24.4	6.0	**Fair** - located at southeast corner of the 825 Taylor Way at the crest of a burm; previously topped at 21.4 m; co-dominant stems have grown; moderate trunk taper; moderate to high live crown ratio; balanced canopy; phototropic lean to the east; buried root flare; signs of chlorosis; area directly to the west where it looks like there is a void or excavation that something could have been there at one time; heavy cone crop; decay cavity visible at base; reaction wood giving trunk a "muscular" appearance; visible nurse logs and stumps in immediate area; burl visible at 9.1 m at northeast side; flattened at east side of bole at base; falls outside the proposed building footprint & zone of heavy construction activites
672	Western Hemlock - *Tsuga heterphylla*	18.5	9.1	3.0	**Fair** - located at southeast corner of the 825 Taylor Way at the crest of a burm; low trunk taper; low live crown ratio; canopy weighted to south; buried root flare; falls outside the proposed building footprint & zone of heavy construction activites
673	Pacific Dogwood - *Cornus nuttallii*	45	15.2	4.5	**Fair** - located at southeast corner of the 825 Taylor Way at the crest of a burm; low trunk taper; low live crown ratio; canopy weighted to north; buried root flare; falls outside the proposed building footprint & zone of heavy construction activites
674	Douglas fir - *Pseudotsuga menziesii*	47	15.2	4.5	**Fair** - located on boulevard on slope at north end of existing hedge row along east property line at 707 Keith Rd; previously topped at 3.0 m; only one stem; canopy weighted to southeast; Ivy growing up stem; falls outside the proposed building footprint & zone of heavy construction activites
675	Red Alder - *Alnus rubra*	30	15.2	5.0	**Fair** - located on boulevard on slope at bottom of slope adjacent to pedestrian walkway at Taylor Way; phototropic lean to the east; deadwood; heavily pruned for clearance for signage & vehicle traffic; buried root flare; deadwood; lots of understory growth beneath this grouping; falls outside the proposed building footprint & zone of heavy construction activites
676	Red Alder - *Alnus rubra*	50	15.2	6.0	**Fair** - located on boulevard on slope at bottom of slope adjacent to pedestrian walkway at Taylor Way; phototropic lean to the east; deadwood; heavily pruned for clearance for signage & vehicle traffic; buried root flare; deadwood; lots of understory growth beneath this grouping; falls outside the proposed building footprint & zone of heavy construction activites
677	Red Alder - *Alnus rubra*	40	15.2	5.5	**Fair** - located on boulevard at mid- slope adjacent to pedestrian walkway at Taylor Way; phototropic lean to the east; deadwood; heavily pruned for clearance for signage & vehicle traffic; buried root flare; deadwood; lots of understory growth beneath this grouping; falls outside the proposed building footprint & zone of heavy construction activites

678	Red Alder - *Alnus rubra*	45	15.2	5.5	**Fair** - located on boulevard on slope at bottom of slope adjacent to pedestrian walkway at Taylor Way; phototropic lean to the east; deadwood; heavily pruned for clearance for signage & vehicle traffic; buried root flare; deadwood; lots of understory growth beneath this grouping; falls outside the proposed building footprint & zone of heavy construction activites
679	Bigleaf Maple - *Acer macrophyllum*	15 & 10	15.2	5.0	**Fair** - located on boulevard on slope at bottom of slope adjacent to pedestrian walkway at Taylor Way; multi-stemmed; phototropic lean to the east; deadwood; heavily pruned for clearance for signage & vehicle traffic; Wildlife snag located directly north of location at crest of slope; deadwood; lots of understory growth beneath this grouping; falls outside the proposed building footprint & zone of heavy construction activites
680	Western Red Cedar - *Thuja plicata*	71	18.3	5.0	**Fair** - located adjacent to north property line at northeast corner of house at 707 Keith Rd; previously topped at 13.7 m; co-dominant stems have grown; partially buried flare; moderate to low live crown ratio; good trunk taper; moderate to heavy cone crop; a lot of landscape debris that has been dumped around it; reaction wood on trunk gives a 'muscular' appearance; falls within proposed building footprint & within zone of heavy construction activites
681	Western Red Cedar - *Thuja plicata*	20	9.1	2.5	**Fair** - located adjacent to north property line as part of a privacy screen for house at 707 Keith Rd; previously topped at 3.7 m; co-dominant stems have grown; canopies weighted to south; exposed root flare; slight grade of slope; partially buried flare; moderate to low live crown ratio; good trunk taper; moderate to heavy cone crop; growing as part of a group of 7 smaller Cedars growing within the immediate area; falls within proposed building footprint & within zone of heavy construction activites
682	Western Red Cedar - *Thuja plicata*	31	9.1	3.0	**Fair** - located adjacent to north property line as part of a privacy screen for house at 707 Keith Rd; previously topped at 3.7 m; co-dominant stems have grown; canopies weighted to south; exposed root flare; slight grade of slope; partially buried flare; moderate to low live crown ratio; good trunk taper; moderate to heavy cone crop; growing as part of a group of 7 smaller Cedars growing within the immediate area; falls within proposed building footprint & within zone of heavy construction activites
683	Western Red Cedar - *Thuja plicata*	17.5	9.1	3.0	**Fair** - located adjacent to north property line as part of a privacy screen for house at 707 Keith Rd; previously topped at 3.7 m; co-dominant stems have grown; canopies weighted to south; exposed root flare; slight grade of slope; partially buried flare; moderate to low live crown ratio; good trunk taper; moderate to heavy cone crop; growing as part of a group of 7 smaller Cedars growing within the immediate area; falls within proposed building footprint & within zone of heavy construction activites

684	Western Hemlock - *Tsuga heterphylla*	35.5 & 19.5	12.2	4.0	**Fair** - located adjacent to north property line as part of a privacy screen for house at 707 Keith Rd; two stems from the base (one is subordinate); partially buried flare; phototropic lean to the south; canopy weighted to south; moderate live crown ratio; moderate trunk taper; moderate cone crop; falls within proposed building footprint & within zone of heavy construction activites
685	Western Red Cedar - *Thuja plicata*	16	9.1	3.0	**Fair** - located adjacent to north property line as part of a privacy screen for house at 707 Keith Rd; previously topped at 3.7 m; co-dominant stems have grown; canopies weighted to south; exposed root flare; slight grade of slope; partially buried flare; moderate to low live crown ratio; low trunk taper; moderate cone crop; growing as part of a group of 4 smaller Cedars growing within the immediate area; falls within proposed building footprint & within zone of heavy construction activites
686	Vine Maple - *Acer circinatum*	10 to 17	6.1	4.0	**Fair** - located to the northwest of the house @ 707 Keith Rd; grouping of 7 to 8 VM clustered together behind hedge; previously topped at 1.0 m; phototropic lean to the south; suckering from previous topping cuts; decay visible at previous topping cut; above crest of slope; falls within proposed building footprint & within zone of heavy construction activites
687	Western Hemlock - *Tsuga heterphylla*	31	15.2	4.0	**Fair** - located at edge of driveway to Keith Rd at west side; previously topped at 3.0 m; included bark at base of stem union appears to be splitting; co-dominant stems have grown; fungal bodies visible on dead structural root at east side; low trunk taper; low live crown ratio; deadwood; falls within proposed building footprint & within zone of heavy construction activites
688	Western Hemlock - *Tsuga heterphylla*	46	24.4	5.0	**Fair** - located at edge of driveway to Keith Rd at west side; moderate trunk taper; low live crown ratio; deadwood in lower canopy; phototropic lean to the south; exposed root flare; growing on nurse log; falls within proposed building footprint & within zone of heavy construction activites; falls outside the proposed building footprint & zone of heavy construction activites
689	Western Hemlock - *Tsuga heterphylla*	48	21.3	4.5	**Fair** - located at edge of driveway to Keith Rd at west side; previously topped at 3.0 m; structural roots visible; moderate trunk taper; low live crown ratio; deadwood; reaction wood visible in trunk; canopy weighted to south; other trees in area tha have been removed; falls outside the proposed building footprint & zone of heavy construction activites
690	Western Hemlock - *Tsuga heterphylla*	34.5	15.2	3.5	**Fair** - located at edge of driveway to Keith Rd at west side; growing on nurse stump; previously topped at 3.0 m; structural roots visible; moderate trunk taper; low live crown ratio; deadwood; reaction wood visible in trunk; canopy weighted to south; other trees in area tha have been removed; falls outside the proposed building footprint & zone of heavy construction activites

691	Western Hemlock - *Tsuga heterphylla*	35	15.2	2.5	**Fair** - located at edge of driveway to Keith Rd at west side; another 20 cm Hemlock growing adjacent to it; previously topped at 3.0 m; co-dominant stems have grown; structural roots visible; growing on nurse stump; moderate trunk taper; low live crown ratio; deadwood; reaction wood visible in trunk; canopy weighted to south; other trees in area that have been removed; Vine Maple located just to the north of location; sap sucker activity; canopy weighted to west; moderate cone crop; falls outside the proposed building footprint & zone of heavy construction activites
692	Western Hemlock - *Tsuga heterphylla*	35.5	18.3	4.0	**Fair** - located south of existing structure; another 19.5 cm Hemlock growing adjacent to it; previously topped at 3.0 m; co-dominant stems have grown; failure in co-dominant stem; structural roots visible & intertwined growing on nurse stump; low trunk taper; moderate live crown ratio; deadwood; balanced canopy; other trees in area that have been removed; Vine Maple located just to the north of location; sap sucker activity; canopy weighted to west; moderate cone crop; falls outside the proposed building footprint & zone of heavy construction activites
693	Western Red Cedar - *Thuja plicata*	17.5	15.2	3.0	**Fair** - located south of existing structure; previously topped at 3.0 m; co-dominant stems have grown; structural roots visible & intertwined growing on nurse stump; low trunk taper; low live crown ratio; deadwood; canopy weighted to west; low cone crop; elevated rooting placement; falls outside the proposed building footprint & zone of heavy construction activites
694	Western Hemlock - *Tsuga heterphylla*	27.5	16.7	3.5	**Fair** - located south of existing structure; previously topped at 3.0 m; co-dominant stems have grown; bulge in lower stem appears to be compartmentalized from an old wound at south side; low trunk taper; moderate live crown ratio; deadwood; exposed root flare; sap sucker activity; canopy weighted to west; moderate cone crop; falls outside the proposed building footprint & zone of heavy construction activites
695	Western Hemlock - *Tsuga heterphylla*	40	24.4	4.0	**Fair** - located south of existing structure; grouping of 6 Hemlock trees growing ontop of a nurse log with advanced decay; only three largest trees have been tagged; previously topped at 3.0 m; co-dominant stems have grown; phototropic lean to northwest; all structural roots intertwined; moderate to low trunk taper; low live crown ratio; falls within proposed building footprint & within zone of heavy construction activites
696	Western Hemlock - *Tsuga heterphylla*	25	21.3	3.0	**Fair** - located south of existing structure; grouping of 6 Hemlock trees growing ontop of a nurse log with advanced decay; previously topped at 3.0 m; co-dominant stems have grown; canopy weighted to north; phototropic lean to northwest; moderate to low trunk taper; low live crown ratio; all structural roots intertwined; falls within proposed building footprint & wthin zone of heavy construction activites

697	Western Hemlock - *Tsuga heterphylla*	28	21.3	3.5	**Fair** - located south of existing structure; grouping of 6 Hemlock trees growing ontop of a nurse log with advanced decay; previously topped at 3.0 m; co-dominant stems have grown; phototropic lean to south; canopy weighted to south; moderate to low trunk taper; low live crown ratio; all structural roots intertwined; falls within proposed building footprint & within zone of heavy construction activites
698	Western Hemlock - *Tsuga heterphylla*	38	22.7	4.0	**Fair** - located south of existing structure; grouping of 3 Hemlock trees growing ontop of a nurse stump; not previously topped; phototropic lean to south; moderate to low trunk taper; low live crown ratio; all structural roots intertwined; sap sucker activity; bow visible in stem; canopies isolated to the top; falls outside the proposed building footprint & zone of heavy construction activites
699	Bigleaf Maple - *Acer macrophyllum*	40	18.3	5.0	**Fair** - located south of existing structure; previously topped; phototropic lean to southwest; canker visible on branches in upper canopy; large structural roots visible at west side; falls outside the proposed building footprint & zone of heavy construction activites
700	Western Hemlock - *Tsuga heterphylla*	26.5	15.2	4.0	**Fair** - located south of existing structure; previously topped at 3.0 m; co-dominant stems have grown; bulges in stems above topping point; phototropic lean to northeast; canopy weighted to northeast; low trunk taper; low live crown ratio; another 19 cm Hemlock growing between #700 & #701; structural roots are interwined; growing on nurse mound; falls outside the proposed building footprint & within zone of heavy construction activites
701	Western Hemlock - *Tsuga heterphylla*	26	12.2	4.0	**Fair** - located south of existing structure; previously topped at 3.0 m; co-dominant stems have grown; bulges in stems above topping point; phototropic lean to southwest; canopy weighted to southwest; low trunk taper; low live crown ratio; another 19 cm Hemlock growing between #700 & #701; galls visible on branches structural roots are interwined; growing on nurse mound; falls outside the proposed building footprint & zone of heavy construction activites
702	Silver Birch - *Betula pendula*	35	15.2	5.0	**Fair** - Phototropic lean to the northeast; dead scaffold branches; previously topped at 6.1 m; difficult to observe base of tree due to under plantings; falls outside the proposed building footprint & zone of heavy construction activites
703	Western Hemlock - *Tsuga heterphylla*	41	21.4	4.0	**Fair** - located near southwest corner of house growing on a nurse stump; structural roots are intertwined; previously topped at 3.0 m; co-dominant stems have grown; moderate trunk taper; moderate to low live crown ratio; falls outside the proposed building footprint & zone of heavy construction activites
704	Western Hemlock - *Tsuga heterphylla*	35.5	21.4	4.0	**Fair** - located near southwest corner of house growing on a nurse stump; structural roots are intertwined; previously topped at 3.0 m; co-dominant stems have grown; moderate trunk taper; moderate to low live crown ratio; falls outside the proposed building footprint & zone of heavy construction activites

705	Vine Maple - *Acer circinatum*	7 to 12	7.6	4.0	**Fair** - multi-stemmed; located approx 5.0 m east of west property line; large stump located just to south of location incl another smaller Maple; falls outside the proposed building footprint & zone of heavy construction activites
706	Western Hemlock - *Tsuga heterphylla*	27	19.8	4.5	**Fair** - Just to the southwest of #703 ˀ exposed flare; low live crown; low trunk taper; deadwood; canopy weighted to the west; sap sucker activity; falls outside the proposed building footprint & zone of heavy construction activites
707	broken tag				
708	English Laurel - *Prunus laurocerasus*	25	9.1	5.0	**Fair** - located approx 3.0 m to the east from the west property line at the southwest corner; provides a lot of screening; falls outside the proposed building footprint & zone of heavy construction activites
709	Bigleaf Maple - *Acer macrophyllum*	55	16.8	5.0	**Fair** - just to the southwest of #702; exposed flare; deadwood; canopy weighted to the west; phototropic lean to the southwest; appears to have lost its top; falls outside the proposed building footprint & zone of heavy construction activites
710	Western Red Cedar - *Thuja plicata*	98	21.3	5.5	**Fair** - located at southwest corner of property; Chapman survey #1969; good trunk taper; high live crown; partially buried flare; lots of Laurel growing around it; previously topped at 10.7 m; co-dominant stems have grown; balanced canopy; low cone crop; falls outside the proposed building footprint & zone of heavy construction activites
711	Bigleaf Maple - *Acer macrophyllum*	65	6.1	3.5	**Fair** - located at southwest corner of proeprty; cut off to a large live stump to approx 2.5 m; lots of suckering growth; phototropic lean to the south; large stump located directly to the north of this location; falls outside the proposed building footprint & zone of heavy construction activites
712	Western Hemlock - *Tsuga heterphylla*	30	9.1	3.0	**Fair to Poor**- located just to west of #699; phototropic lean to the east; appears to have experienced a root failure at some point in past; broken top; low trunk taper; low live crown ratio; sap sucker activity; low cone crop; falls outside the proposed building footprint & zone of heavy construction activites
713	Western Hemlock - *Tsuga heterphylla*	41	21.3	4.5	**Fair** - located west of driveway to Keith Rd adjacent to nurse log; located south of #690; Chapman Survey #1961; has been window pruned; moderate to low trunk taper; low live crown ratio; large structural root visible at north side; large reaction wood rib on the north side; sap sucker activity; high live crown; moderate taper; falls outside the proposed building footprint & zone of heavy construction activites
714	Western Red Cedar - *Thuja plicata*	45	18.3	3.0	**Fair** - located west of driveway to Keith Rd approx 5.0 m east of west property line; located south of #690 & more south than neighbours Hemlock; structural roots are intertwined; previously topped at 3.0 m; co-dominant stems have grown; moderate to low trunk taper; low live crown ratio; growing on sloped grade; elevated root placement; reaction wood gives trunk a 'muscular' appearance; falls outside the proposed building footprint & zone of heavy construction activites

715	Western Hemlock - *Tsuga heterphylla*	31	18.3	4.0	**Fair** - located east of driveway to Keith Rd across from #713; has been window pruned; low trunk taper; low live crown ratio; sap sucker activity; high live crown; small juvenile Hemlock just to the south; structural roots are intertwined; exposed root flares; falls within proposed building footprint & within zone of heavy construction activites
716	Western Hemlock - *Tsuga heterphylla*	41.5	18.3	4.5	**Fair** - located east of driveway to Keith Rd across from #713; has been window pruned; co-dominant stems have grown; low trunk taper; moderate live crown ratio; exposed root flares; falls within proposed building footprint & within zone of heavy construction activites
717	Bigleaf Maple - *Acer macrophyllum*	27 & 20	6.1	5.0	**Fair** - Multi-stemmed; previously topped at 1.5 m; decay visible in lower bole; suckering growth; falls within proposed building footprint & within zone of heavy construction activites
718	Western Hemlock - *Tsuga heterphylla*	45	24.4	4.5	**Fair** - located east of driveway to Keith Rd just south of #716; has been window pruned; low trunk taper; moderate live crown ratio; exposed root flares; canopy has been raised to 12.2 m; falls within proposed building footprint & within zone of heavy construction activites
719	Western Hemlock - *Tsuga heterphylla*	40	21.3	4.5	**Fair** - located east of driveway to Keith Rd just south of #716; has been window pruned; low trunk taper; moderate live crown ratio; exposed root flares; canopy has been raised to 12.2 m; growing on nurse stump; juvenile Hemlock located just to the northwest of that; phototropic lean to the east; falls within proposed building footprint & within zone of heavy construction activites
720	Western Hemlock - *Tsuga heterphylla*	55	21.3	4.5	**Fair** - located east of driveway to Keith Rd just south of #716; has been window pruned; low trunk taper; moderate live crown ratio; exposed root flares; canopy has been raised to 12.2 m; growing on nurse stump; canopy weighted to west; phototropic lean to the west; falls within proposed building footprint & within zone of heavy construction activites
721	Western Red Cedar - *Thuja plicata*	15 to 22	10.7	3.5	**Fair** - Part of a hedge located at adjacent to the northwest corner of 707 Keith Rd and east of #717; located on a sloped grade; grouping of 4 trees; previously topped at 3.0 m; co-dominant stems have grown; buried root flare; falls within proposed building footprint & within zone of heavy construction activites
722	Western Red Cedar - *Thuja plicata*	8 to 17	10.7	4.0	**Fair** - Part of a hedge located just southeast of #721; located on a sloped grade; grouping of 3 trees; previously topped at 3.0 m; co-dominant stems have grown; buried root flare; falls within proposed building footprint & within zone of heavy construction activites
723	Western Red Cedar - *Thuja plicata*	17.5 & 27	10.7	4.0	**Fair** - Part of a hedge located just southeast of #721; located on a sloped grade; grouping of 2 trees; previously topped at 3.0 m; co-dominant stems have grown; buried root flare; falls within proposed building footprint & within zone of heavy construction activites
724	Western Red Cedar - *Thuja plicata*	63	21.3	4.0	**Fair** - Part of a hedge located just west of #723; previously topped at 3.0 m; co-dominant stems have grown; buried root flare; falls within proposed building footprint & within zone of heavy construction activites

725	Bigleaf Maple - *Acer macrophyllum*	20 to 30	13.7	5.0	**Fair** - located at west side of driveway to Keith Rd across from #729; previously topped at 3.0 m; mutli-stemmed; 2 clusters of trees; decay cavities visible; suckering growth; phototropic lean to the southwest; deadwood; buried root flares; dead scaffold branches; just west of #725 there are some Alder saplings growing; falls within proposed building footprint & within zone of heavy construction activites
726	Western Red Cedar - *Thuja plicata*	19	12.2	4.0	**Fair** - Part of a hedge located just south of #724; previously topped at 3.0 m; co-dominant stems have grown; buried root flare; falls within proposed building footprint & within zone of heavy construction activites
727	Western Red Cedar - *Thuja plicata*	37	12.2	4.0	**Fair** - Part of a hedge located just south of #724; previously topped at 3.0 m; co-dominant stems have grown; buried root flare
728	Western Red Cedar - *Thuja plicata*	43.5	12.2	4.0	**Fair** - Part of a hedge located just south of #724; previously topped at 3.0 m; co-dominant stems have grown; buried root flare; falls within proposed building footprint & within zone of heavy construction activites
729	Bigleaf Maple - *Acer macrophyllum*	18 to 25	13.7	5.0	**Fair** - located at east side of driveway to Keith Rd at northwest edge of house at 707 Keith Rd; previously topped at 3.0 m; mutli-stemmed; 2 clusters of trees; decay cavities visible; suckering growth; phototropic lean to the south; deadwood; buried root flares; dead scaffold branches; falls within proposed building footprint & within zone of heavy construction activites
730	Bigleaf Maple - *Acer macrophyllum*	7 to 15	13.7	5.0	**Fair** - located at west side of driveway to Keith Rd across from #729 and just north of #725; previously topped at 3.0 m; mutli-stemmed; 2 clusters of trees; decay cavities visible; suckering growth; phototropic lean to the southwest; deadwood; buried root flares; dead scaffold branches; falls within proposed building footprint & within zone of heavy construction activites
731	Western Red Cedar - *Thuja plicata*	15	7.6	3.0	**Fair** - located at west side of driveway to Keith Rd; not previously topped; high live crown ratio; low trunk taper; buried root flares; falls within proposed building footprint & within zone of heavy construction activites
732	Bigleaf Maple - *Acer macrophyllum*	25	13.7	5.0	**Fair** - located atweast side of driveway to Keith Rd; previously topped at 3.0 m; decay cavities visible; suckering growth; phototropic lean to the southeast; deadwood; buried root flares; dead scaffold branches; falls within proposed building footprint & within zone of heavy construction activites
733	Western Red Cedar - *Thuja plicata*	18 & 10	6.1	3.0	**Fair** - Located at west side of driveway to Keith Rd; group of 2 trees; not previously topped; low trunk taper; high live crown; falls within proposed building footprint & within zone of heavy construction activites
734	Vine Maple - *Acer circinatum*	10 to 15	6.1	4.0	**Fair** - located at west side of driveway adjacent to Keith Rd; previously topped at 3.0 m; mutli-stemmed; heavily pruned for clearance to Hydro; decay cavities visible; suckering growth; phototropic lean to the south; deadwood; buried root flares; ivy growing up stems; falls outside the proposed building footprint & zone of heavy construction activites

735	Western Hemlock - *Tsuga heterphylla*	30	7.6	3.0	**Fair** - located at west side of driveway adjacent to Keith Rd; previously topped at 6.1 m; heavily pruned for clearance to Hydro; phototropic lean to the southeast; deadwood; buried root flares; ivy growing up stem; falls within proposed building footprint & within zone of heavy construction activites
736	Vine Maple - *Acer circinatum*	10 to 20	6.1	3.0	**Fair** - located at west side of driveway adjacent to Keith Rd; previously topped at 3.0 m; mutli-stemmed; heavily pruned for clearance to Hydro; decay cavities visible; suckering growth; phototropic lean to the south; deadwood; buried root flares; ivy growing up stems; falls within proposed building footprint & within zone of heavy construction activites
737	Bigleaf Maple - *Acer macrophyllum*	20 to 45	13.7	5.0	**Fair** - located at east side of driveway to Keith Rd north of #736; previously topped at 3.0 m; mutli-stemmed; 2 clusters of trees; decay cavities visible; suckering growth; phototropic lean to the southwest; deadwood; buried root flares; dead scaffold branches; sloughing bark; growing on a nurse stump; falls within proposed building footprint & within zone of heavy construction activites

*DBH defn: Diameter at Breast Height = Diameter measurements were made at 1.4 m from grade. See attached Report for further info

*Previously topped could be as a result of mechanical or natural means

RECOMMENDATIONS

825 Taylor Way & 707 Keith Rd, WV

Milliken Developments
Attn: Kate Milliken Binns
901 W 3rd Street, Ste #334
North Vancouver, BC
V7P 3P9

November 28, 2012

Suite #264, 718-333 Brooksbank Ave, North Vancouver, BC V7J 3V8
PH: 778.319.6164 Fax: 778.262.0140

Radix

Recommendations
825 Taylor Way & 707 Keith Rd, WV

28-Nov-12

Tree Tag #	Species	DBH (cm)	Recommendations	Tree Protection Zone (msmt from base of tree)
605	Vine Maple - *Acer circinatum*	15	**Retain & montior** - falls near but outside the heaviest construction zone; remove any ivy growing on stem; tree protection req'd	at 1.5 m from base of tree or at dripline around entire grouping on all sides affected
606	Western Hemlock - *Tsuga heterphylla*	35	**Retain & montior** - falls near but outside the heaviest construction zone; remove any ivy growing on stem; tree protection req'd	at 2.25 m from base of tree or at dripline around entire grouping on all sides affected
607	Western Hemlock - *Tsuga heterphylla*	31.5	**Retain & montior** - falls near but outside the heaviest construction zone; remove any ivy growing on stem; tree protection req'd	at 2.25 m from base of tree or at dripline around entire grouping on all sides affected
608	Bigleaf Maple - *Acer macrophyllum*	7 to 25	**Retain & montior** - falls near but outside the heaviest construction zone; remove any ivy growing on stem; tree protection req'd	at 1.5 m from base of tree or at dripline around entire grouping on all sides affected
609	Western Hemlock - *Tsuga heterphylla*	35.5	**Retain & montior** - falls near but outside the heaviest construction zone; remove any ivy growing on stem; tree protection req'd	at 2.25 m from base of tree or at dripline around entire grouping on all sides affected
610	Western Hemlock - *Tsuga heterphylla*	39	**Remove** - tree is dead & already has experienced a stem failure	n/a
611	Western Hemlock - *Tsuga heterphylla*	17.5	**Remove** - tree is in a state of decline	n/a
612	Bigleaf Maple - *Acer macrophyllum*	18	**Remove** - falls outside the heaviest construction zone; tree is insignificant tree with poor architectural framework that would interfere with establishing proposed screening to neighbour; more suitable tree would be better for this location	n/a
613	Saucer Magnolia - *Magnolia soulangiana*	23 & 24	**Retain & montior** - falls near but outside the heaviest construction zone; pruning will be req'd to structural prune & remove any deadwood; tree protection req'd	at 2.5 m from south side; at 3.5 m from base of tree at east & west sides; extend to the fence line to the north

614	Limber Pine - *Pinus flexilis* cvs	10	**Retain & montior** - falls near the location of retaining walls & the heaviest construction zone; transplanting to relocate to a more suitable area; tree protection req'd; **OR** - **Remove** - may not able to be properly cared for as a transplant during the construction period	at 1.2 m from base of tree or at dripline on all sides affected
615	Bigleaf Maple - *Acer macrophyllum*	24	**Remove** - falls near the zone of heavy construction activity but outside the bldg footrpint; poor location with a low potential for improvement	n/a
616	Apple - *Malus* sp	19.5	**Remove** - falls near the zone of heavy construction activity but outside the bldg footrpint; poor condition & poor location with a low potential for improvement	n/a
617	Western Red Cedar - *Thuja plicata*	100	**Retain & montior** - falls near but outside the heaviest construction zone; pruning will be req'd to mitigate any concerns of stem failure in co-dominant stems or to remove any deadwood; aerial inspection of previous topping point & possible supplemental support system recommended; remove any ivy growing on stem; tree protection req'd	at 4.0 - 5.0 m from base of tree or at dripline on all sides affected & to encompass with #618; **NB:** ***this is a large tree near the excavation zone thus arborist must be on site during excavation around this tree***
618	Western Red Cedar - *Thuja plicata*	96	**Retain & montior** - falls near but outside the heaviest construction zone; pruning will be req'd to mitigate any concerns of stem failure in co-dominant stems or to remove any deadwood & provide clearance; aerial inspection of previous topping point & possible supplemental support system recommended; remove any ivy growing on stem; tree protection req'd	at 4.0 - 5.0 m from base of tree or at dripline on all sides affected & to encompass with #617; **NB:** ***this is a large tree near the excavation zone thus arborist must be on site during excavation around this tree***
619	Vine Maple - *Acer circinatum*	10 & 20	**Retain & montior** - falls outside the bldg footprint but near the heaviest construction zone; remove any ivy growing on stems; pruning to remove deadwood or structural prune; **OR** - **Remove** - poor location caused poor architectural form with a low potential for improvement	at 1.8 m from base of tree or at dripline on all sides affected; encompass with #617 & #618
620	Western Red Cedar - *Thuja plicata*	70	**Remove** - falls within close proximity to bldg footprint & within zone of heavy construction activity	n/a
621	Western Hemlock - *Tsuga heterphylla*	40.5	**Remove** - falls outside bldg footprint & near zone of heavy construction; removal will benefit better adjacent trees & mitigate any concerns with it failing into neighbouring property; more suitable tree would be better for this location	n/a

622	Holly - *Ilex aquifolium*	17.5	**Retain & montior** - falls near but outside the heaviest construction zone; pruning to provide form & maintain screening; remove any ivy growing on stem; tree protection req'd	at 1.5 m from base of tree or at dripline on all sides affected; encompass with neighbouring trees
623	English Laurel - *Prunus laurocerasus*	19 to 25	**Retain & montior** - falls near but outside the heaviest construction zone; pruning to provide form & maintain screening; remove any ivy growing on stem; tree protection req'd; **NB:** there may be the odd Laurel **removed** from this grouping that are the closest to the construction activities to accomodate the proposed retaining walls	at 1.5 m from base of tree or at dripline on all sides affected; encompass with neighbouring trees
624	broken tag			
625	Western Hemlock - *Tsuga heterphylla*	75	**Remove** - falls within close proximity to bldg footprint & zone of heavy construction activity for retaining walls	n/a
626	Western Hemlock - *Tsuga heterphylla*	23.5	**Remove** - falls within close proximity to bldg footprint & zone of heavy construction activity for retaining walls	n/a
627	Western Hemlock - *Tsuga heterphylla*	22.5	**Remove** - falls within close proximity to bldg footprint & zone of heavy construction activity for retaining walls	n/a
628	Western Hemlock - *Tsuga heterphylla*	26.5	**Remove** - falls with close proximity to bldg footprint & zone of heavy construction activity for retaining walls	n/a
629	Western Red Cedar - *Thuja plicata*	34	**Remove** - falls with close proximity to bldg footprint & zone of heavy construction activity for retaining walls	n/a
630	Douglas fir - *Pseudotsuga menziesii*	75	**Remove** - falls with close proximity to bldg footprint & zone of heavy construction activity for retaining walls	n/a
631	Western Red Cedar - *Thuja plicata*	86	**Remove** - falls with close proximity to bldg footprint & zone of heavy construction activity for retaining walls	n/a
632	Bigleaf Maple - *Acer macrophyllum*	40 & 48	**Retain & montior** - falls near but outside the heaviest construction zone for retaining walls; pruning will be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at no less than 3.5 m from base of tree or at dripline on all sides affected to encompass with #633 & #634
633	Vine Maple - *Acer circinatum*	8 & 10	**Retain & montior** - falls near but outside the heaviest construction zone for retaining walls; pruning will be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at 1.2 m from base of tree or at dripline on all sides affected or to encompass with #632 & #634
634	Western Hemlock - *Tsuga heterphylla*	61	**Retain & montior** - falls near but outside the heaviest construction zone for retaining walls; pruning will be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at no less than 3.5 m from base of tree or at dripline on all sides affected; encompass with #632 & #633

635	Western Red Cedar - *Thuja plicata*	18	**Retain & montior** - falls near but outside the heaviest construction zone for retaining walls; pruning will be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at 1.2 m from base of tree or at dripline on all sides affected encompass with #634 & #636
636	Cypress - *Chamaecyparis* sp	35 & 29	**Retain & montior** - falls near but outside the heaviest construction zone for retaining walls; pruning will be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at 3.0 m from base of tree or at dripline on all sides affected encompass with #634 & #635
637	Western Red Cedar - *Thuja plicata*	23	**Retain & montior**- falls near but outside the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd; **OR Remove** - may be impacted by decomissioning of existing driveway at Taylor Way	at no less than 2.0 m from base of tree or at dripline on all sides affected to encompass with neighbouring trees
638	Western Hemlock - *Tsuga heterphylla*	15 & 17	**Retain & montior**- falls near but outside the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd; **OR Remove** - may be impacted by decomissioning of existing driveway at Taylor Way	at no less than 2.0 m from base of tree or at dripline on all sides affected to encompass with neighbouring trees
639	Western Hemlock - *Tsuga heterphylla*	25	**Retain & montior**- falls near but outside the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at no less than 2.0 m from base of tree or at dripline on all sides affected to encompass with neighbouring trees
640	Bigleaf Maple - *Acer macrophyllum*	105	**Remove** - falls near but outside the heaviest construction zone; has already experienced a failure in upper canopy; not expected to be long term tree on this site; poor condition with a low potential for improvement	n/a
641	Western Hemlock - *Tsuga heterphylla*	33	**Retain & montior**- falls near but outside the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at 2.25 m from base of tree or at dripline on all sides affected to encompass entire group
642	Western Red Cedar - *Thuja plicata*	16	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
643	Western Hemlock - *Tsuga heterphylla*	89	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
644	Pacific Dogwood - *Cornus nuttallii*	15	**Retain & montior**- falls near but outside the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at 1.2 m from base of tree or at dripline on all sides affected to encompass with neighbouring trees

645	Douglas fir - *Pseudotsuga menziesii*	19	**Retain & montior**- falls near but outside the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at 1.2 m from base of tree or at dripline on all sides affected to encompass with neighbouring trees
646	Western Hemlock - *Tsuga heterphylla*	31.5	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
647	Bigleaf Maple - *Acer macrophyllum*	102	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
648	Western Hemlock - *Tsuga heterphylla*	17	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
649	Bigleaf Maple - *Acer macrophyllum*	17	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
650	Bigleaf Maple - *Acer macrophyllum*	76	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
651	Western Hemlock - *Tsuga heterphylla*	24.5	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
652	Western Hemlock - *Tsuga heterphylla*	20	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
653	Tulip Tree - *Liriodendron tulipifera*	78	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
654	Western Hemlock - *Tsuga heterphylla*	21	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
655	Western Hemlock - *Tsuga heterphylla*	21.5	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
656	Western Red Cedar - *Thuja plicata*	42	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
657	Western Hemlock - *Tsuga heterphylla*	27	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
658	Western Red Cedar - *Thuja plicata*	125	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
659	Western Hemlock - *Tsuga heterphylla*	22	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
660	Western Hemlock - *Tsuga heterphylla*	41.5	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
661	Western Hemlock - *Tsuga heterphylla*	52	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a

662	Bigleaf Maple - *Acer macrophyllum*	10 to 12	**Remove** - falls within proposed bldg footprint & zone of heavy construction activity	n/a
663	Bigleaf Maple - *Acer macrophyllum*	10 to 20	**Remove** - falls within proposed bldg footprint & zone of heavy construction activity	n/a
664	Cherry - *Prunus emarginata*	20	**Remove** - falls within proposed bldg footprint & zone of heavy construction activity	n/a
665	Bigleaf Maple - *Acer macrophyllum*	7 to 15	**Remove** - falls within proposed bldg footprint & zone of heavy construction activity	n/a
666	Western Hemlock - *Tsuga heterphylla*	16	**Remove** - falls within proposed bldg footprint & zone of heavy construction activity	n/a
667	Western Hemlock - *Tsuga heterphylla*	19.5	**Remove** - falls within proposed bldg footprint & zone of heavy construction activity	n/a
668	Western Hemlock - *Tsuga heterphylla*	21.5	**Retain & mention**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any Ivy growing on stem; tree protection req'd	at no less than 1.5 m from tree or at dripline on all sides affected to encompass as group with neighbouring trees
669	Pacific Dogwood - *Cornus nuttallii*	21	**Retain & mention**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any Ivy growing on stem; tree protection req'd	at no less than 1.5 m from tree or at dripline on all sides affected to encompass as group with neighbouring trees
670	Western Hemlock - *Tsuga heterphylla*	19	**Retain & mention**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any Ivy growing on stem; tree protection req'd	at no less than 1.5 m from tree or at dripline on all sides affected to encompass as group with neighbouring trees
671	Western Red Cedar - *Thuja plicata*	150	**Retain & mention**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any Ivy growing on stem; tree protection req'd	at no less than 4.0 - 5.0 m from tree or dripline on all sides affected to encompass with neighbouring trees; <u>**NB**</u>: ***this is a large tree near the excavation zone thus arborist must be on site during excavation around this tree***
672	Western Hemlock - *Tsuga heterphylla*	18.5	**Retain & mention**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any Ivy growing on stem; tree protection req'd	at no less than 1.5 m from tree or at dripline on all sides affected to encompass with neighbouring trees

673	Pacific Dogwood - *Cornus nuttallii*	45	**Retain & mention**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any Ivy growing on stem; tree protection req'd	at no less than 2.7 m from tree or at dripline on all sides affected to encompass with neighbouring trees
674	Douglas fir - *Pseudotsuga menziesii*	47	**Retain & mention**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any Ivy growing on stem; tree protection req'd	at no less than 2.7 m from tree or at dripline on all sides affected to encompass with neighbouring trees
675	Red Alder - *Alnus rubra*	30	**Retain & mention**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any Ivy growing on stem; tree protection req'd	at no less than 2.0 m from tree or at dripline on all sides affected to encompass with neighbouring trees; along sidewalk edge at east side
676	Red Alder - *Alnus rubra*	50	**Retain & mention**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any Ivy growing on stem; tree protection req'd	at no less than 3.0 m from tree or at dripline on all sides affected to encompass with neighbouring trees; along sidewalk edge at east side
677	Red Alder - *Alnus rubra*	40	**Retain & mention**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any Ivy growing on stem; tree protection req'd	at no less than 2.7 m from tree or at dripline on all sides affected to encompass with neighbouring trees; along sidewalk edge at east side
678	Red Alder - *Alnus rubra*	45	**Retain & mention**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any Ivy growing on stem; tree protection req'd	at no less than 2.7 m from tree or at dripline on all sides affected to encompass with neighbouring trees; along sidewalk edge at east side
679	Bigleaf Maple - *Acer macrophyllum*	15 & 10	**Retain & mention**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any Ivy growing on stem; tree protection req'd	at no less than 2.0 m from tree or at dripline on all sides affected to encompass with neighbouring trees; along sidewalk edge at east side
680	Western Red Cedar - *Thuja plicata*	71	**Remove** - falls within proposed bldg footprint & zone of heavy construction activity	n/a
681	Western Red Cedar - *Thuja plicata*	20	**Remove** - falls within proposed bldg footprint & zone of heavy construction activity	n/a
682	Western Red Cedar - *Thuja plicata*	31	**Remove** - falls within proposed bldg footprint & zone of heavy construction activity	n/a
683	Western Red Cedar - *Thuja plicata*	17.5	**Remove** - falls within proposed bldg footprint & zone of heavy construction activity	n/a

684	Western Hemlock - *Tsuga heterphylla*	35.5 & 19.5	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
685	Western Red Cedar - *Thuja plicata*	16	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
686	Vine Maple - *Acer circinatum*	10 to 17	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
687	Western Hemlock - *Tsuga heterphylla*	31	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
688	Western Hemlock - *Tsuga heterphylla*	46	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
689	Western Hemlock - *Tsuga heterphylla*	48	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
690	Western Hemlock - *Tsuga heterphylla*	34.5	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
691	Western Hemlock - *Tsuga heterphylla*	35	**Retain & montior**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at no less than 2.0 m from tree or at dripline on all sides affected to encompass with neighbouring trees
692	Western Hemlock - *Tsuga heterphylla*	35.5	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
693	Western Red Cedar - *Thuja plicata*	17.5	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
694	Western Hemlock - *Tsuga heterphylla*	27.5	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
695	Western Hemlock - *Tsuga heterphylla*	40	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
696	Western Hemlock - *Tsuga heterphylla*	25	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
697	Western Hemlock - *Tsuga heterphylla*	28	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
698	Western Hemlock - *Tsuga heterphylla*	38	**Retain & montior**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at no less than 2.5 m from tree or at dripline on all sides affected to encompass with neighbouring trees

699	Bigleaf Maple - *Acer macrophyllum*	40	**Retain & montior**- falls outside the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at no less than 2.5 m from tree or at dripline on all sides affected to encompass with neighbouring trees
700	Western Hemlock - *Tsuga heterphylla*	26.5	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
701	Western Hemlock - *Tsuga heterphylla*	26	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
702	Silver Birch - *Betula pendula*	35	**Remove** - falls outside proposed bldg footpring & zone of heavy construction activity; removal would be beneficial to other trees	n/a
703	Western Hemlock - *Tsuga heterphylla*	41	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
704	Western Hemlock - *Tsuga heterphylla*	35.5	**Retain & montior**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at no less than 2.5 m from tree or at dripline on all sides affected to encompass with neighbouring trees
705	Vine Maple - *Acer circinatum*	7 to 12	**Remove** - falls within proposed bldg footpring & zone of heavy construction activity	n/a
706	Western Hemlock - *Tsuga heterphylla*	27	**Retain & montior**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at no less than 2.5 m from tree or at dripline on all sides affected to encompass with neighbouring trees
707	broken tag			
708	English Laurel - *Prunus laurocerasus*	25	**Retain & montior**- falls outside the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at 1.5 m from base of tree or at dripline on all sides affected to encompass neighbouring trees
709	Bigleaf Maple - *Acer macrophyllum*	55	**Retain & montior**- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at no less than 3.3 m from tree or at dripline on all sides affected to encompass with neighbouring trees
710	Western Red Cedar - *Thuja plicata*	98	**Retain & montior**- falls outside the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at 4.0 - 5.0 m from base fo tree or at dripline on all sides affected to encompass neighbouring trees

711	Bigleaf Maple - *Acer macrophyllum*	65	Retain & monitor- falls outside the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at 3.0 m from base of tree or at dripline on all sides affected to encompass neighbouring trees
712	Western Hemlock - *Tsuga heterphylla*	30	Remove - falls outside but near the heaviest construction zone; already has experienced a root failure; more suitable tree would be better in this location	n/a
713	Western Hemlock - *Tsuga heterphylla*	41	Remove - falls within proposed bldg footpring & zone of heavy construction activity	n/a
714	Western Red Cedar - *Thuja plicata*	45	Retain & monitor- falls outside but near the heaviest construction zone; pruning may be req'd to structural prune & remove any deadwood; remove any ivy growing on stem; tree protection req'd	at no less than 2.7 m from tree or at dripline on all sides affected to encompass with neighbouring trees
715	Western Hemlock - *Tsuga heterphylla*	31	Remove - falls within proposed bldg footpring & zone of heavy construction activity	n/a
716	Western Hemlock - *Tsuga heterphylla*	41.5	Remove - falls within proposed bldg footpring & zone of heavy construction activity	n/a
717	Bigleaf Maple - *Acer macrophyllum*	27 & 20	Remove - falls within proposed bldg footpring & zone of heavy construction activity	n/a
718	Western Hemlock - *Tsuga heterphylla*	45	Remove - falls within proposed bldg footpring & zone of heavy construction activity	n/a
719	Western Hemlock - *Tsuga heterphylla*	40	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance & main access to site	n/a
720	Western Hemlock - *Tsuga heterphylla*	55	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance & main access to site	n/a
721	Western Red Cedar - *Thuja plicata*	15 to 22	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance & main access to site	n/a
722	Western Red Cedar - *Thuja plicata*	8 to 17	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance & main access to site	n/a
723	Western Red Cedar - *Thuja plicata*	17.5 & 27	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance & main access to site	n/a
724	Western Red Cedar - *Thuja plicata*	63	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance & main access to site	n/a

725	Bigleaf Maple - *Acer macrophyllum*	20 to 30	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance, parking stalls & main access to site	n/a
726	Western Red Cedar - *Thuja plicata*	19	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance & main access to site	n/a
727	Western Red Cedar - *Thuja plicata*	37	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance & main access to site	n/a
728	Western Red Cedar - *Thuja plicata*	43.5	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance & main access to site	n/a
729	Bigleaf Maple - *Acer macrophyllum*	18 to 25	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance & main access to site	n/a
730	Bigleaf Maple - *Acer macrophyllum*	7 to 15	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance, parking stalls & main access to site	n/a
731	Western Red Cedar - *Thuja plicata*	15	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance, parking stalls & main access to site	n/a
732	Bigleaf Maple - *Acer macrophyllum*	25	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance & main access to site	n/a
733	Western Red Cedar - *Thuja plicata*	18 & 10	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance, parking stalls & main access to site	n/a
734	Vine Maple - *Acer circinatum*	10 to 15	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance & main access to site	n/a
735	Western Hemlock - *Tsuga heterphylla*	30	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance & main access to site	n/a
736	Vine Maple - *Acer circinatum*	10 to 20	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance & main access to site	n/a
737	Bigleaf Maple - *Acer macrophyllum*	20 to 45	Remove - falls within bldg footpring & zone of heavy construction activity for driveway entrance & main access to site	n/a

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December 7, 2012

File: 5012230-001

Milliken Developments
901 West 3rd Street, Suite 304
North Vancouver, BC V7P 3P9

Attention: Ms. Kate Milliken-Binns

Dear Ms. Milliken-Binns,

Reference: Traffic Impact Study
707 Keith Road – West Vancouver, BC

As part of its Rezoning and Development Permit application, Milliken Developments retained MMM Group to prepare a Traffic Impact Study of their proposed Supportive Living and Memory Care community on the surrounding road network. This letter report presents our findings, recommendations, and conclusions regarding the need for any improvements to the adjacent and nearby transportation system in order to maintain a satisfactory level of service, an acceptable level of safety, and the appropriate access provisions. Key items that have been considered include, in no particular order:

- ✓ Spacing between the proposed site driveway and the Taylor Way intersection
- ✓ Trip generation rates and parking generation ratios
- ✓ Impact on traffic on the surrounding road network

PROPOSED DEVELOPMENT

As shown in **Figure 1**, Milliken Developments is proposing to construct a 92-suite / 110-resident (bed) Supportive Living and Memory Care community on two single-family residential lots (707 Keith Road and 525 Taylor Way) which are located in the northwest corner of the intersection of Taylor Way and Keith Road in the District of West Vancouver (District). Access to the eight surface and 32 underground parking spaces would be provided from a right-in / right-out driveway located on Keith Road (**see Figure 2**.)

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Figure 1 – Vicinity Map

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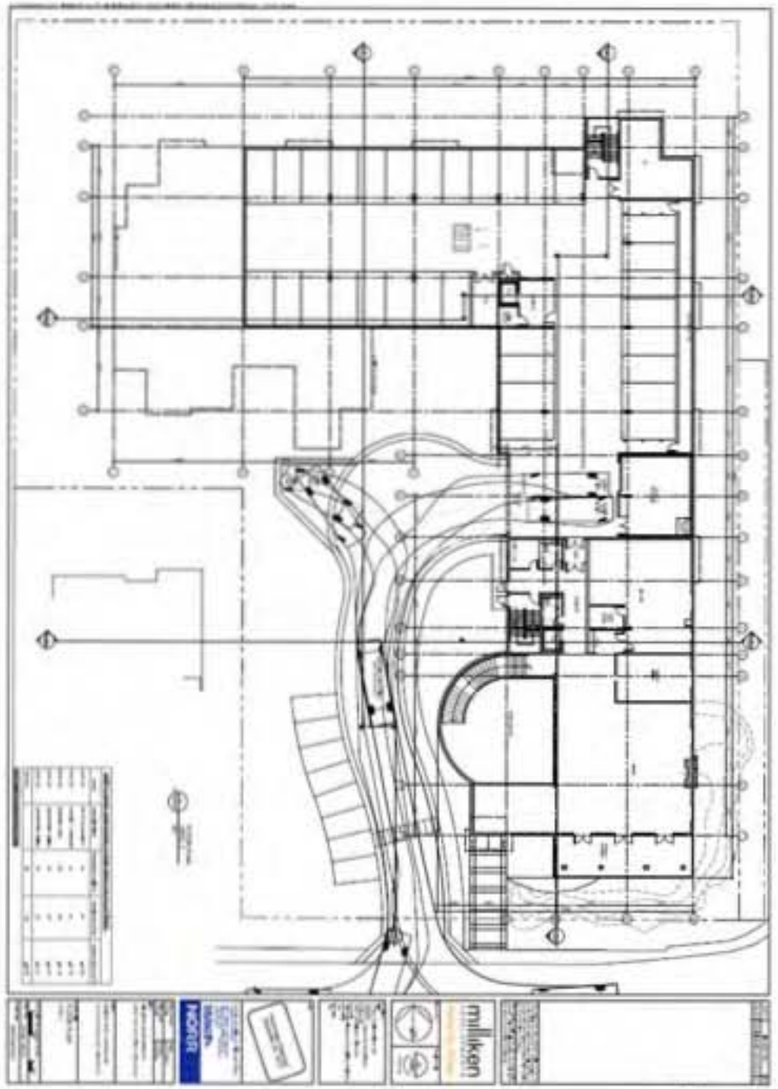

Figure 2 – Site Plan

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METHODOLOGY

In order to address the District's requirements, MMM Group completed the following work plan:

- ✓ Confirmed the scope of the Traffic Impact Study with District staff.
- ✓ Conducted peak period trip generation surveys at the 107-unit Sunrise of Lynn Valley assisted living facility located at 980 Lynn Valley Road, North Vancouver on Tuesday, November 20, 2012 between 7:00 and 9:00 a.m. and 4:00 and 6:00 p.m.
- ✓ Visited the site and surroundings on Monday, November 26, 2012 to clearly understand the study area in terms of current access, street laning, parking, pedestrian and cyclist facilities, transit, and traffic control measures.
- ✓ Estimated background traffic for the study horizon (2022) which incorporates traffic generated by the Evelyn by Onni project plus the annual growth rate of 1.0 percent per year provided by the Ministry.
- ✓ Estimated site-generated traffic for the development (at build-out) based on trip rate results of the trip generation survey, information in MMM Group files measured at similar developments in Metro Vancouver as well as data published in the Institute of Transportation's *Trip Generation, 8th Edition*.
- ✓ Quantified the traffic generated by existing uses, i.e. single-family homes
- ✓ Quantified the amount of new site-generated vehicular traffic that will be added to the adjacent road at build-out (= proposed development – existing uses)
- ✓ Estimated directional distribution for the development (at build-out) using trip orientation established during the rezoning process for the Evelyn by Onni project and assigned site-generated traffic to the road network for the 2022 peak hour scenarios.
- ✓ Estimated total traffic for the 2022 horizon year by summing the site-generated and background traffic.
- ✓ Used Synchro 8 software to evaluate operational performance (i.e. delays, queues, etc.) at study intersections for the following scenarios:
    - Existing (2012) weekday AM and PM peak hours
    - Future (2022) weekday AM and PM peak hours without the development
    - Future (2022) weekday AM and PM peak hours with the development

  During the weekday PM peak hour, southbound traffic queues on Taylor Way were observed to spill back from the Marine Drive intersection through the Keith Road intersection. As such, the capacity of the southbound through lanes (in Synchro) was reduced to 1000 vehicles per hour (weekday afternoon peak hour only) to better reflect observed capacity of the southbound movement through the intersection.
- ✓ Reviewed and commented on site circulation, pedestrian connections and parking supply.

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FINDINGS

Existing Traffic Volumes

Existing weekday morning and afternoon Saturday midday peak hour traffic volumes at the intersection of Keith Road and Taylor Way are illustrated in **Figure 3**. As suggested above, southbound traffic on Taylor Way experiences long queues (and corresponding long delays) during peak periods. Queues spillback from the Marine Drive intersection, resulting from capacity constraints on the Lions Gate Bridge. This condition was observed during the traffic counts for the weekday afternoon peak hour only (i.e. did not occur during the morning peak hour).

Trip Generation Counts

Trip generation counts were conducted by MMM Group to measure the trip generation at a similar Supportive Living and Memory Care community, namely Sunrise of Lynn Valley in North Vancouver. Statistics for the existing and proposed Supportive Living and Memory Care communities are compared in **Table 1**.

Table 1: Comparison of Building Statistics

Characteristic	Sunrise of Lynn Valley (Existing)	707 Keith Road (Proposed)
Building		
• Land Use	Supportive Living and Memory Care	Supportive Living and Memory Care
• Suites	96	92
• Residents (Beds)	107	110
Other Variables		
• Classification of adjacent street	Major Arterial	Major Road
• Availability of on-street parking	Prohibited	Limited
• No. of bus routes on adjacent street	3	1
• Distance to nearest bus stop	<200m	<200m
• Distance to nearest residences	<200m	<200m

As shown in Table 1, the existing and proposed Supportive Living and Memory Care communities share similar characteristics including availability of transit service, lack of nearby on-street parking, and classification of adjacent streets.

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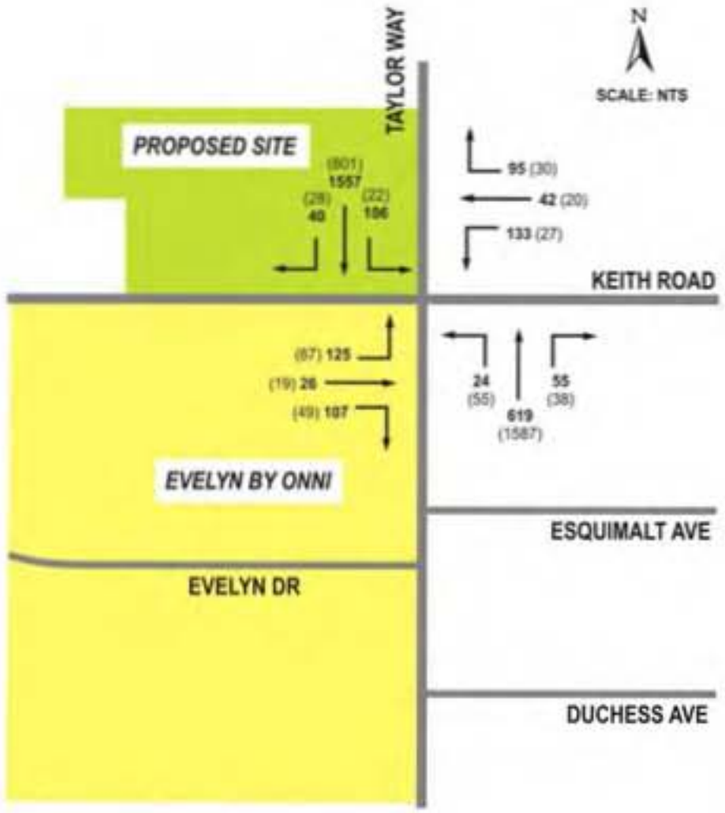

Figure 3 – Existing (2012) Traffic Volumes

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Published data indicates that trip generation peaks at Supportive Living and Memory Care communities during the weekday AM and PM peak hours.[1] The trip generation at Sunrise of Lynn Valley is summarized in **Table 2** for typical weekday AM and PM peak hours with published trip generation rates provided for comparative purposes.

Table 2 – Supportive Living and Memory Care Trip Rates

Source	Independent Variable	AM Peak Hour			PM Peak Hour			Notes
		Entering	Exiting	Total*	Entering	Exiting	Total*	
Trip Generation Survey	Beds	73%	27%	0.24	41%	59%	0.30	1
ITE	Beds	65%	35%	0.14	44%	56%	0.22	2

Notes: * - vehicle trips per independent variable, e.g. bed
1 – Trip Generation Survey, Tuesday, November 20, 2012 - Sunrise of Lynn Valley, North Vancouver
2 – Land Use 254: Assisted Living, *Trip Generation, 8th Edition* (Washington, DC: Institute of Transportation Engineers, 2008)

A key finding is that the trip rates and directional distribution measured at Sunrise of Lynn Valley provide a conservative (or high) estimate of trip generation for the proposed form of development.

Site Generated Traffic

Trip rates used to estimate site-generated traffic for the existing and proposed forms of development during the weekday AM and PM peak hours are summarized in **Table 3**.

Table 3 – Weekday Peak Hour Trip Rates

Land Use	Independent Variable	AM Peak Hour			PM Peak Hour			Source
		Entering	Exiting	Total*	Entering	Exiting	Total*	
Supportive Living and Memory Care	Beds	73%	27%	0.24	41%	59%	0.30	1
Single-Family Residential	Dwelling Units	25%	75%	0.75	63%	37%	1.01	2

Notes: * - vehicle trips per independent variable, e.g. bed
1 – Trip Generation Survey, Tuesday, November 20, 2012 - Sunrise of Lynn Valley, North Vancouver
2 – Land Use 210: Single-Family Residential, *Trip Generation, 8th Edition* (Washington, DC: Institute of Transportation Engineers, 2008)

The site-generated traffic volumes for the proposed development are presented in **Table 4**.

[1] *Trip Generation, 8th Edition* (Washington, DC: ITE, 2008)

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Table 4 – Site-Generated Traffic Volumes*

Land Use	AM Peak Hour			PM Peak Hour		
	Entering	Exiting	Total	Entering	Exiting	Total
Supportive Living and Memory Care	20	7	27	13	20	33
Single-Family Residential (Existing)	-1	-1	-2	-1	-1	-2
TOTAL	19	6	25	12	19	31

Notes: * - vehicles per hour (vph)

When completed, the development is expected to add 25 new vehicle trips (= 19 entering + 6 exiting) to the road network during the weekday AM peak hour of adjacent street traffic and 31 vehicle trips (= 12 entering + 19 exiting) during the PM peak hour.

Trip Distribution and Traffic Assignment

Site-generated traffic was distributed using trip orientation established during the rezoning process for the Evelyn by Onni project across the street:

- ✓ 20% to/from west
- ✓ 30% to/from north
- ✓ 50% to/from south

The assignment of site-generated traffic to the study intersection is illustrated in **Figure 4** and accounts for the right-in / right-out movements at the site driveway plus the new roundabout just west of the site at Keith Road and Evelyn Drive. Consequently, site-generated traffic must approach from Taylor Way while departing traffic has an opportunity to U-turn at Evelyn Drive in order to turn north (left) or south (right) at Taylor Way.

Future (2022) Total Traffic

The background 2022 peak hour traffic volumes (i.e. without development) incorporates traffic generated by the Evelyn by Onni project plus the annual growth rate of 1.0 percent per year provided by the Ministry. Given that traffic volumes at the Keith Road / Taylor Way intersection currently operate at capacity during peak periods, increases in through traffic may result in longer queues rather than more traffic traveling through the intersection.

Future 2022 total traffic volumes were determined by adding the site-generated traffic volumes to the 2022 future traffic volumes without development. Total traffic volumes are illustrated in **Figure 5**.

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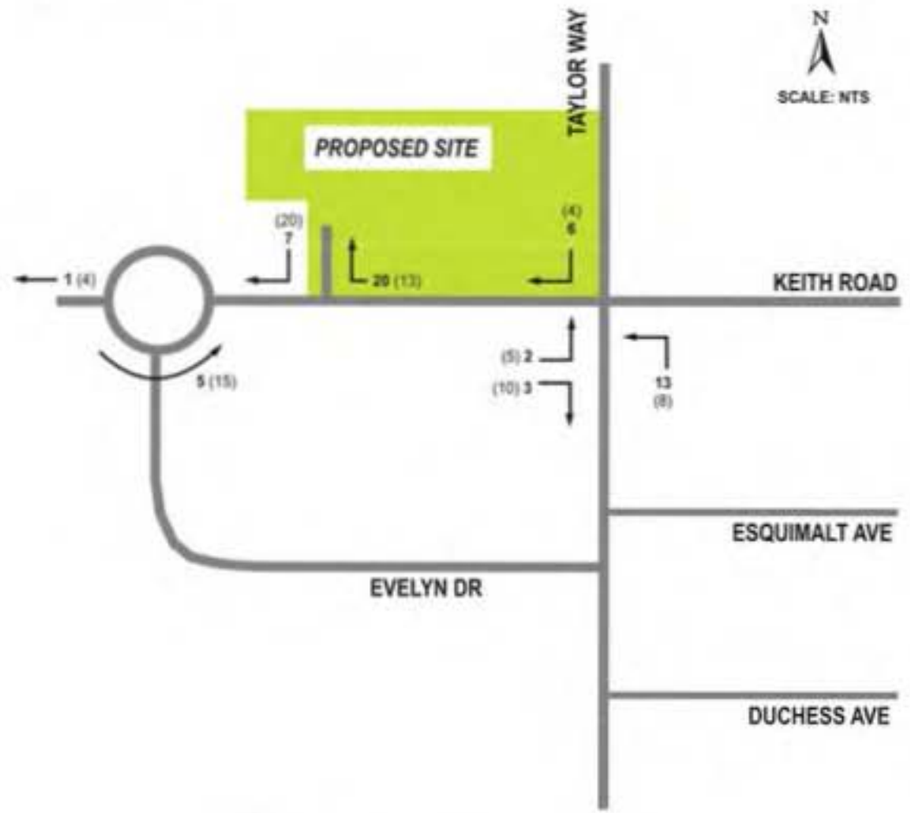

LEGEND

Weekday AM Peak Hour Volumes	xx
Weekday PM Peak Hour Volumes	(xx)

Figure 4 – Site-Generated Traffic Volumes (at build-out)

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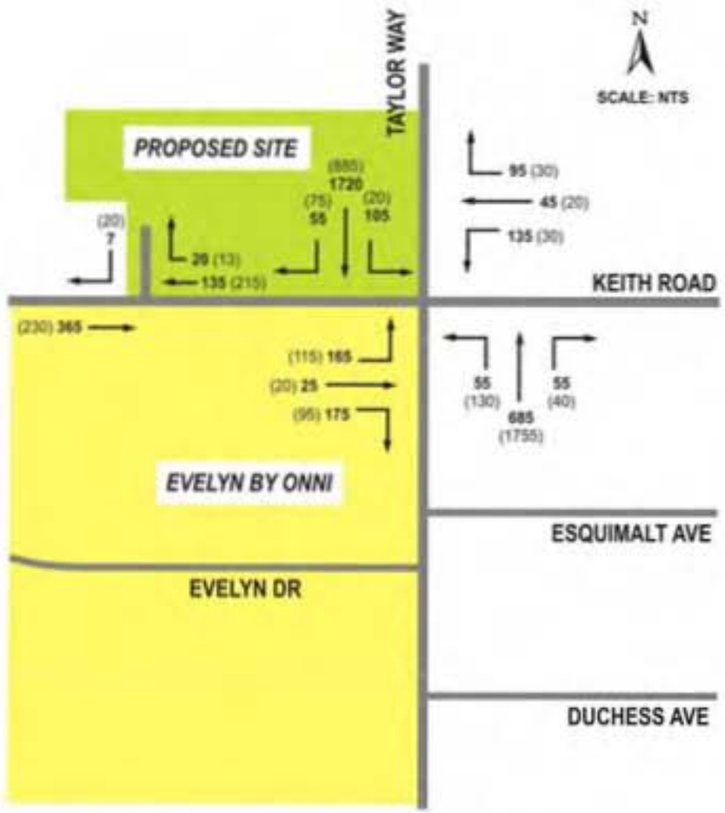

LEGEND

Weekday AM Peak Hour Volumes	xx
Weekday PM Peak Hour Volumes	(xx)

Turning movements rounded to nearest 5

Figure 5 – Future (2022) Total Peak Hour Traffic Volumes

Operational Analysis

The future analysis accounts for the right-in / right-out movements at the site driveway and includes improved laning on Keith Road at Taylor Way (west leg of intersection) which provides eastbound left-turn and right-turn lanes (each with 35m storage length). The remaining intersection approaches are modeled per existing conditions.

Reported measures of traffic performance include volume to capacity (v/c) ratio and a delay-based traffic Level of Service (LOS) indicator ranging from LOS A (ideal) to LOS F (over-saturated) conditions. Typical peak hour urban conditions are in the LOS C to LOS D range with average delays ranging from 20 to 55 seconds per vehicle at signalized intersections and 15 to 35 seconds per vehicle at unsignalized intersections. As a target for design parameters, LOS D for individual approaches is considered appropriate for the study area. The results – based upon the *Highway Capacity Manual* (Washington DC: Transportation Research Board, 2010) intersection capacity generated by the Synchro software – are attached to this report and summarized in **Table 5** for the following scenarios:

- ✓ Existing (2012) weekday AM and PM peak hours
- ✓ Future (2022) weekday AM and PM peak hours without the development
- ✓ Future (2022) weekday AM and PM peak hours with the development

Key findings from Table 5 include:

- ✓ Keith Road / Taylor Way:
  - During the weekday AM peak hour, the east and westbound approaches to this signalized intersection currently operate at LOS E and LOS F. These approaches are expected to continue operating at LOS E and LOS F in the future, even with the planned improvements.
  - During the weekday PM peak hour, movements on all but one of the approaches operate at LOS D or better. Southbound traffic is expected to operate at LOS E, given that southbound traffic queues on Taylor Way spill back from the Marine Drive intersection through the Keith Road intersection.
- ✓ Keith Road / Driveway:
  - The site driveway is expected to operate al LOS B or better.

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Table 5 – Existing and Future Peak Hour Traffic Conditions

Location	Intersection Control	Movement	Existing (2012)		Future (2022) without Development		Future (2022) with Development	
			LOS	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio
Weekday AM Peak Hour								
Keith Road / Taylor Way	Traffic Signal	EBL	F	1.77	F	1.74	F	1.87
		EBT			C	0.09	C	0.09
		EBR			F	1.34	F	1.36
		WBLT	F	1.12	E	0.89	E	0.92
		WBR	B	0.35	B	0.38	C	0.39
		NBL	A	0.13	A	0.23	B	0.29
		NBT	B	0.51	B	0.51	B	0.49
		SBL	A	0.28	A	0.29	A	0.28
		SBT	C	0.89	D	0.98	D	1.01
Keith Road / Driveway	Minor Street Stop Control	WBTR	n/a		n/a		A	0.01
		SBR					A	0.10
Weekday PM Peak Hour								
Keith Road / Taylor Way	Traffic Signal	EBL	D	0.75	D	0.66	D	0.67
		EBT			C	0.08	C	0.08
		EBR			A	0.33	A	0.34
		WBLT	C	0.28	D	0.29	D	0.28
		WBR	A	0.13	A	0.14	A	0.14
		NBL	A	0.16	A	0.40	A	0.43
		NBT	C	0.90	C	0.97	C	0.97
		SBL	A	0.13	A	0.13	A	0.13
		SBT	C	0.89	E	1.08	F	1.09
Keith Road / Driveway	Minor Street Stop Control	WBTR	n/a		n/a		A	0.03
		SBLR					A	0.15

Notes: NB = northbound, etc. L = left, etc. LOS = Level of Service, V/C Ratio = Volume-to-Capacity Ratio

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The results of the intersection queuing analysis are summarized in **Table 6**.

Table 6 – Comparison of Future (2022) Queues and Storage Length

Location	Movement	Storage Length (m)	95th Percentile Queue Length (m)	
			Future (2022) without Development	Future (2022) with Development
Weekday AM Peak Hour				
Keith Road / Taylor Way	EBL	35	85	85
	EBT	n/a	10	10
	EBR	35	15	25
	WBT	n/a	55	50
	WBR	channelized	15	15
	NBL	**45**	**10**	**10**
	NBT	n/a	75	75
	SBL	**40**	**15**	**15**
	SBT	n/a	280	280
Weekday PM Peak Hour				
Keith Road / Taylor Way	EBL	35	40	40
	EBT	n/a	10	10
	EBR	35	15	10
	WBT	n/a	20	20
	WBR	channelized	5	0
	NBL	**45**	**20**	**20**
	NBT	n/a	300	305
	SBL	**40**	**5**	**5**
	SBT	n/a	180	185

Notes: NB = northbound, etc., queue length rounded to the nearest 5m

Key findings include:

- ✓ Northbound and southbound left-turn queue lengths on Taylor Way (from analysis) are within available storage limits.
- ✓ If forecasted site traffic volumes materialize, the eastbound left-turn queue may exceed available storage length during weekday peak hours and consequently block the site driveway.
- ✓ During peak hours, queues on Taylor Way are expected to range between 75 and 300m at the Keith Road intersection. Spillback from adjacent intersections, however, was observed during the weekday afternoon peak hour. Increases in traffic volume could, therefore, result in longer queues rather than increased intersection utilization.

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Site Circulation

As illustrated in Figure 2, key circulation elements of the site include:

- ✓ Hardscaped road with an adjacent sidewalk connecting the site driveway on Keith Road and the underground parkade.
- ✓ Eight perpendicular visitor parking spaces located on the hardscaped road near the building entrance.
- ✓ A hammerhead turnaround at the entrance to the underground parkade.
- ✓ Designated loading area under the building adjacent to the lobby, kitchen, and waste and recycling room.
- ✓ Thirty-two underground parking spaces for visitors and staff.

Benefits of the current site plan include:

- ✓ The throat length at the site driveway would accommodate at least one vehicle, which is equal to the maximum number of vehicles expected to queue at this location.
- ✓ Site servicing (i.e. deliveries, garbage and recycling pick-up, etc.) would occur under the building thereby reducing, if not eliminating visual and auditory impacts.

Concerns about the current site plan include:

- ✓ Combining the loading area and the entrance to the underground parkade may result in truck-passenger car conflicts as trucks back into the loading area while passenger cars attempt to enter or exit the parkade. This concern could be mitigated by adding engineering controls (preferred) such as traffic signals, parabolic mirrors, etc.; or providing administrative controls (least preferred) such as having staff stop traffic while trucks manoeuvre around the loading area.

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Pedestrian Connectivity

Sidewalk along Keith Road / Taylor Way – sidewalk would continue to be provided along the site frontage providing opportunities for residents, visitors and staff to walk to nearby destinations, e.g. bus stops on Taylor Way, shops and services at Park Royal.

Keith Road / Taylor Way Intersection – this signalized intersection is equipped with push-button-actuated pedestrian signals and marked with crosswalks facilitating the movement of pedestrians across the intersection.

Figure 6 – Pedestrian Signals and Sidewalk on Northwest Corner of Keith Road / Taylor Way

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Parking Supply

Forty off-street parking spaces (= 8 surface + 32 underground) would be provided on the site. As summarized in **Table 7**, the District's requirements yield a need for at least 34 vehicle parking spaces for the proposed development. The number of small car parking spaces on the site may not exceed 30% of the total parking spaces. Consequently, these requirements will be met.

Table 7 – Zoning Bylaw No. 4662, 2010 Parking Requirements

Land Use	Parking Ratio	Independent Variable	Parking Spaces
Assisted Living	1 parking space for every 3.3 beds, minimum	110 beds	34

Notes: *Zoning Bylaw No. 4662, 2010*, PH1 – Private Hospital 1, p 550-2

Table 8 compares the peak parking demand from the ITE *Parking Generation, 4th Edition* and a Lower Mainland assisted living facility.

Table 8 – Parking Demand at Supportive Living and Memory Care Communities

Source	Independent Variable	Parking Ratio	Peak Period Parking Demand	Notes
ITE	110 occupied beds	0.35 spaces per bed	39 spaces	1
Nikkei Place	110 occupied beds	0.36 spaces per bed	40 spaces	2

Notes: 1 – Land Use 254: Assisted Living, *Parking Generation, 4th Edition* (Washington, DC: Institute of Transportation Engineers, 2010)
2 – Parking Utilization Survey of 72-bed Nikkei Home (Assisted Living), Burnaby, BC (Vancouver, BC: MMM Group (formerly ND LEA), May 2003)

Key findings include:

- ✓ At comparable Supportive Living and Memory Care Communities, the average peak parking demand varies from 0.35 to 0.36 parking spaces per bed
- ✓ At 0.36 parking spaces per bed, the proposed parking supply at 707 Keith Road equals the typical parking demand at comparable facilities (i.e. 0.35 to 0.36 parking spaces per bed)

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RECOMMENDATIONS

In light of the findings, the following recommendations are forwarded for consideration:

1. Limit movements at the site driveway to right-in / right-out through signage.
2. Revisit the design of the loading area with a view to adding engineering controls (preferred); such as traffic signals, parabolic mirrors, etc.; or providing administrative controls (least preferred) such as having staff stop traffic while trucks manoeuvre around the loading area.

SUMARY AND CONCLUSIONS

A 92-suite / 110-resident Supportive Living and Memory Care community is proposed for the northwest corner of Keith Road and Taylor Way in West Vancouver. Access to the eight surface and 32 underground parking spaces would be provided from a right-in / right-out driveway located on Keith Road. The site is currently occupied by two single-family dwelling units.

- ✓ When completed, the development is expected to add 25 new vehicle trips (= 19 entering + 6 exiting) to the road network during the weekday AM peak hour of adjacent street traffic and 31 vehicle trips (= 12 entering + 19 exiting) during the PM peak hour.
- ✓ An operational analysis indicated that the site driveway on Keith Road is expected to operate at acceptable levels (i.e. LOS A or better) with the proposed development. Consequently, intersection improvements do not appear to be required.
- ✓ At 35m, the proposed spacing between the site driveway and Taylor Way appears to be sufficient.
- ✓ The operational analysis indicated that the signalized intersection of Keith Road and Taylor Way currently operated at unacceptable levels (i.e. LOS E or worse) with and without the proposed development given the planned improvements.
- ✓ The north and southbound left-turn lanes at the Keith Road / Taylor Way intersection are anticipated to accommodate future traffic volumes such that vehicle queues (generated by left-turning traffic) will not spill back into the through traffic lanes on Taylor Way.
- ✓ If forecasted traffic volumes generated by the adjacent Evelyn by Onni project materialize in 10 years, the eastbound left-turn queue may exceed available storage length during weekday peak hours. Consequently, northbound drivers leaving the site may choose to head west from the site, avoiding the Keith Road / Taylor Way intersection.
- ✓ The proposed parking supply (= 40 spaces) meets both District requirements (=34 spaces) and the peak demand observed at comparable facilities (=40 spaces).
- ✓ Improvements to the site plan and road network have been identified for consideration. These include turning restrictions at the site driveway and the design of the loading area.

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Ms. Kate Milliken-Binns

* * * * *

Should you have any questions about our methodology, findings, recommendations or conclusions; please contact me at (604) 685-9381 or vanweelderenf@mmm.ca.

Yours truly,

MMM Group Limited

<original signed by>

Floris van Weelderen, P.Eng., PTOE
Manager, Transportation Planning
Associate Partner

Attachments:
Appendix A – Trip Generation Survey at Sunrise of Lynn Valley, North Vancouver, BC
Appendix B – Intersection Capacity and Queuing (Synchro) Calculations

5012230-001
707 Keith Road - West Vancouver, BC
21-Nov-12
FvW / SW

Trip Generation Survey - Sunrise at Lynn Valley

Land use:	ITE 254 - Assisted Living
Address:	980 Lynn Valley Road, North Vancouver, BC
Date of Count:	20-Nov-12
Day of Week:	Tuesday
Light:	Dusk / Daylight
Weather:	Cloudy
Road Surface:	Damp
Independent Variable:	96 rooms
	107 beds

Weekday AM Peak Period

	Passenger Car			Heavy Vehicle			Total			Peak Hour			
Time of Day	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total	
7:00 AM	0	1	1	0	0	0	0	1	1			14	
7:15 AM	0	0	0	1	1	2	1	1	2			18	
7:30 AM	0	1	1	0	0	0	0	1	1			23	7:45 - 8:45 a.m.
7:45 AM	4	1	5	3	2	5	7	3	10	19	7	26	
8:00 AM	4	1	5	0	0	0	4	1	5			22	
8:15 AM	5	1	6	0	1	1	5	2	7				
8:30 AM	3	1	4	0	0	0	3	1	4	73%	27%	0.27	trips per room
8:45 AM	3	3	6	0	0	0	3	3	6	73%	27%	0.24	trips per bed

Weekday AM Peak Period

	Passenger Car			Heavy Vehicle			Total			Peak Hour			
Time of Day	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total	
4:00 PM	2	3	5	0	1	1	2	4	6			26	
4:15 PM	3	4	7	0	0	0	3	4	7			30	
4:30 PM	2	6	8	0	0	0	2	6	8	13	19	32	4:30 - 5:30 p.m.
4:45 PM	2	3	5	0	0	0	2	3	5			29	
5:00 PM	6	4	10	0	0	0	6	4	10			30	
5:15 PM	3	6	9	0	0	0	3	6	9				
5:30 PM	4	1	5	0	0	0	4	1	5	41%	59%	0.33	trips per room
5:45 PM	2	4	6	0	0	0	2	4	6	41%	59%	0.30	trips per bed

PLEASE NOTE that tree barriers shown are not to scale but rather to show the intent. Please refer to the Recommendations Table attached to report for futher information.

TOPOGRAPHIC PLAN OF LOT 1; AND LOT 3, EXCEPT PART IN PLAN VAP 23118; BOTH OF SOUTH EAST 1/4 OF DISTRICT LOT 1047

GROUP ONE, NEW WESTMINSTER DISTRICT

PLAN 14144

LOT 1 – P.I.D. 007–947–526

LOT 3 – P.I.D. 007–947–534

SCALE: 8 FEET TO 1 INCH.

EDEN PLACE

AT NO LESS THAN 2.25 M FROM BASE OF TREE #607 OR AT DRIPLINE ON ALL SIDES AFFECTED TO ENCOMPASS ENTIRE TREE

AT NO LESS THAN 2.5 M FROM BASE OF TREE #613 AT SOUTH SIDE; 3.5 M AT EAST & WEST SIDES; OR AT DRIPLINE ON ALL SIDES AFFECTED TO ENCOMPASS ENTIRE GROUP

AT NO LESS THAN 3.5 M FROM BASE OF TREE #632 & #634 OR AT DRIPLINE ON ALL SIDES AFFECTED TO ENCOMPASS ENTIRE GROUP

AT NO LESS THAN 4.0 M TO 5.0 M FROM BASE OF TREE OR AT DRIPLINE ON ALL SIDES AFFECTED TO ENCOMPASS ENTIRE GROUP

AT NO LESS THAN 1.5 M FROM BASE OF TREE OR AT DRIPLINE ON ALL SIDES AFFECTED TO ENCOMPASS ENTIRE GROUP

AT NO LESS THAN 2.0 M FROM BASE OF TREES OR AT DRIPLINE ON ALL SIDES AFFECTED TO ENCOMPASS ENTIRE GROUP

AT NO LESS THAN 2.25 M FROM BASE OF TREE #641 OR AT DRIPLINE ON ALL SIDES AFFECTED TO ENCOMPASS ENTIRE GROUP

AT NO LESS THAN 3.3 M FROM BASE OF TREE #709 OR AT DRIPLINE ON ALL SIDES AFFECTED TO ENCOMPASS ENTIRE GROUP

AT NO LESS THAN 3.0 M FROM BASE OF TREE #676 OR AT DRIPLINE ON ALL SIDES AFFECTED TO ENCOMPASS ENTIRE GROUP

AT NO LESS THAN 4.0 TO 5.0 M FROM BASE OF TREE #671 OR AT DRIPLINE ON ALL SIDES AFFECTED TO ENCOMPASS ENTIRE GROUP

AT NO LESS THAN 2.7 M FROM BASE OF TREE #714 OR AT DRIPLINE ON ALL SIDES AFFECTED TO ENCOMPASS ENTIRE GROUP

Topography completed 19 December, 2001.

Additional topography of Lot 3 completed 14 November, 2012.

This Document is not valid unless originally signed & sealed.

Certified Correct according to Plan 14144 and Plan VAP23118:

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ , B.C.L.S.
William Ray Chapman

this 20th day of November, 2012.

Note:
Elevations are to Geodetic Datum and are derived from Manhole #961 opposite SW corner 727 Keith Road. North Invert = 131.43'.

LEGEND

= TREE PROTECTION BARRIERS

= TREES PROPOSED FOR RETENTION

British Columbia Land Surveyors
#107–100 Park Royal South
WEST VANCOUVER, B.C.
V7T 1A2 604–926–7311
FAX 604–926–6923
EMAIL sandy@chapmansurvey.com

B3 BOOK:2234(65) JOB:12–181 FILE:2181D DRAWN BY: RB
COMP: Q:\Eagle\2181D\MS2181D–1–3–12181–TOP.dwg

PLEASE NOTE that tree canopies are not to scale. Location or placement of trees is reasonably accurate without the use of a GPS device.

TOPOGRAPHIC PLAN OF LOT 1; AND LOT 3, EXCEPT PART IN PLAN VAP 23118; BOTH OF SOUTH EAST 1/4 OF DISTRICT LOT 1047

GROUP ONE, NEW WESTMINSTER DISTRICT

PLAN 14144

LOT 1 – P.I.D. 007–947–526

LOT 3 – P.I.D. 007–947–534

SCALE: 8 FEET TO 1 INCH.

EDEN PLACE

EASEMENT EXPLANATORY PLAN 17168

RIGHT OF WAY REFERENCE PLAN 17019

REFERENCE PLAN 8584

REFERENCE PLAN VAP23118

KEITH ROAD

TAYLOR WAY

6 PLAN 19976

5 PLAN 19976

3 PLAN 8773

1 PLAN 14144 57,270 sq.ft. [5,320.5 sq.m.]

2 PLAN 8727

2 PLAN 14144

AMENDED 3 PLAN 14144 11,991 Sq.ft. [1,114.0 Sq.m.]

DL 1047

DWELLING 752 EDEN PLACE (AS FOUND MARCH 1984)

DWELLING 736 EDEN PLACE (AS FOUND OCTOBER 1991)

DWELLING 825 TAYLOR WAY (TIES TO SIDING)

DWELLING 760 EDEN PLACE

DWELLING 727 KEITH ROAD

DWELLING 707 KEITH ROAD

OLD SHED (NO FOUNDATION)

METAL SHED

SHED ON SLAB

COVERED ENTRANCE

COVERED CONCRETE SLAB

TRELLIS

GARDEN

LAWN

BLACKTOP

CARPORT CONCRETE SLAB

COVERED CONCRETE PATIO

CONCRETE PATIO

DECK

MAIN FLOOR OVERHANG

2nd FLOOR OVERHANG

OVERHANG

DECK

MAIN FLOOR 175.3

MAIN FLOOR 177.3

MAIN FLOOR 173.7

MAIN FLOOR 156.4

ROOF RIDGE

WOOD FENCE

CHAINLINK FENCE

LATTICE FENCE

OVERHEAD WIRES

WIRES OVER

EAVE

TOP PLANTER

TOE PLANTER

EDGE BLACKTOP

CONCRETE SIDEWALK

SIDEWALK

CONC PAD

STEPS

CENTERLINE HEDGE (WIDTH VARIES)

DITCH (1.0 WIDE)

BT SIDEWALK

LET DOWN

TOP STONE WALL (1.0 WIDE)

TOE STONE WALL (0.65 WIDE)

TOP CONC WALL (0.5 WIDE)

TOP WOOD WALL (0.3 WIDE)

TOP BLOCK WALL

TOE BLOCK WALL

TOE WALL

CONC WALL (0.65 WIDE)

DWELLING OVER DECK

2ND FLOOR OVER DECK

LANDING

PLANTER

PAVERS

POSTS (1.3x1.3)

ASPHALT DRIVEWAY

BROKEN SIDEWALK

CATCH BASIN

MANHOLE

SERVICE BOX

LAMP

ELEC BOX

LAMP BASE

ELEC MH 2.0ø

BUS SIGN

OLD NAIL (13)

OLD NAIL (34) 167.7

OLD NAIL (36) 142.9

OLD NAIL (1) 140.2

OLD IRON POST

OLD SPIKE (31) 157.5

OLD SPIKE (33) 166.6

OLD SPIKE (32) 144.5

OLD SPIKE (2) 173.3

OLD TACK IN LEAD (41) 135.2

OLD HOLE (11) 129.5

OLD HOLE (3) 128.7

OLD LEAD PLUG 126.2

1.0 ABOVE GROUND, DISTURBED

1.0 ABOVE GROUND, UNDISTURBED

1.0 BELOW GROUND, DISTURBED

1.0 BELOW GROUND, UNDISTURBED

WATER METER 130.5

WATER VALVE 130.9

WATER TANK

WATER TAP

HYDRO MH 133.0

PPOLE

SANITARY MANHOLE #961 TOP=138.4 INV=131.43

SANITARY MANHOLE TOP=128.7 INVERT=118.5

STORM MANHOLE TOP=126.5 INVERT=116.9 (ALL PIPES 2.0ø)

STORM MANHOLE TOP=125.4 INVERT=122.1 (E–W PIPES 2.0ø) (N PIPE 1.5ø)

SANITARY MANHOLE TOP=125.1 INVERT=119.6

PIPE 0.67ø INV=135.8

PIPE 0.67ø INV=135.5

80.00 [24.384m] 90° 11' 20"

148.69 [45.321m] 90° 12' 00"

252.94 [77.096m]

104.25 [31.775m]

163.68 [49.890m] 0° 19' 00"

150.05 [45.735m] 0° 19' 00"

116.99 [35.661m] 0° 18' 00"

107.16 [32.661m] 0° 15' 20"

78.25 [23.851m] 0° 15' 20"

118.42 [36.094m] 0° 15' 20"

10.00 [3.048m] 90° 15' 20"

93.20 [28.407m] 90° 11' 20"

79.98 [24.378m] 90° 11' 20"

85.24 [25.983m]

61.35 [18.688m] 20.56 [6.268m]

9.84

11.48

20.0

8.0

LEGEND

= TREES PROPOSED FOR REMOVAL

= TREES PROPOSED FOR RETENTION

Topography completed 19 December, 2001.

Additional topography of Lot 3 completed 14 November, 2012.

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_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ , B.C.L.S.
William Ray Chapman

this 20th day of November, 2012.

Note:
Elevations are to Geodetic Datum and are derived from Manhole #961 opposite SW corner 727 Keith Road. North Invert = 131.43'.

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B3 BOOK:2234(65) JOB:12–181 FILE:2181D DRAWN BY: RB
COMP: Q:\Eagle\2181D\MS2181D–1–3–12181–TOP.dwg