1 10 Aug 2015 Issued for DP Minor Amendment

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Student Residence at Brock Commons

University of British Columbia



Client	Project Manager	Architect	Tall Wood Design Specialist	Construction Manager	Code	Structural	Mechanical	Electrical	Envelope	Landscape	Geotechnical	Acoustic	Surveyor	Civil	LEED
UBC Student Housing & Hospitality Services David Kiloh 6335 Thunderbird Crescent Vancouver BC V6T 1Z4 t 604.822.9705	UBC Properties Trust David English 200-3313 Shrum Lane Vancouver BC V6S 0C8 t 604.731.3103	Acton Ostry Architects Inc Russell Acton / Matthew Wood 111 East 8th Ave Vancouver BC V5T 1R8 t 604.739.3344	Architekten Hermann Kaufmann ZT GmbH Hermann Kaufmann / Christoph Dunser Sportplatweg 5 6858 Schwarzach Austria t 43.(0).5572.58174	Urban One Builders Blair Wilson / Brent Olund 301-611 Alexander Street Vancouver V6A 1E1 t 604.873.5100	GHL Consultants Ltd. Andrew Harmsworth / Gary Chen 950-409 Granville Street Vancouver BC V6C 1T2 t 604.689.4449	Fast + Epp Paul Fast / Bernhard Gafner 201-1672 W 1st Avenue Vancouver BC V6J 1G1 t 604.731.74.12	Stantec Michael Dhont / Svetlana Vujic 1100-111 Dunsmuir Street Vancouver BC V6B 6A3 t 604.696.8000	Stantec Jim Jay / Randy Hing 1100-111 Dunsmuir Street Vancouver BC V6B 6A3 t 604.696.8000	RDH Building Science Brian Hubbs / Graham Finch 224 West 8th Avenue Vancouver BC V5Y 1N5 t 604.873.1181	Hapa Collaborative Joseph Fry / Hanako Amaya 403-375 West 5th Avenue Vancouver BC V5Y 1J6 t 604.909.4150	Geopacific Consultants Ltd. Steven Fofonoff 215-1200 West 73rd Avenue Vancouver BC V6P 6G5 t 604.439.0922	Daniel Lyzun	Greg Martson 201-12448 82nd Avenue	Michael Kamps 79 Cheritan Avenue	Stantec Graham Twyford-Miles 1100-111 Dunsmuir Street Vancouver BC V6B 6A3 t 604.696.8000

6088 Walter Gage Road University of British Columbia Vancouver, BC District Lot 3044 Group 1 New Westminster District except; Firstly; Part on Plan 6147 Secondly; Part on Plan 9301 Thirdly; Part on Plan BCP6556 Fourthly; Part on Plan BCP23719 53.0m proposed (53.0m permitted) front yard: 5.3m from project boundary / street edge rear yard: 5.7m from project boundary side yard(s): varies; refer to site plan 4 visitor (3 regular + 1 designated electric vehicle stall w/charging station) per Campus Wide Design Guidelines - 2.5.5.b.i Class 1 (lockers / bike room) 338 proposed within suites (108 required) Class 2 (weather-protected) 6 provided plus use of off site facilities; refer to site plan (108 required) Floor Areas gross area (s.m.) area / unit (s.m.) social & study space 31.7 washrooms mechanical (excludes mechanical and electrical) studio dwelling unit (1 bed / unit) quad dwelling unit (4 beds / unit) communications / housekeeping (excludes mechanical and electrical) (18 floor substitute one of two Quads for a Lounge) Note: all mechanical and electrical spaces have been excluded (areas calculated to centre line of exterior wall)

Note: all mechanical and electrical spaces have been included (areas calculated to outside face of exterior walls)

Geodetic Elevation

Development Permit Minor Amendment

SITE COVERAGE (%)

Building Section Marker Plan Elevation Marker Elevation Benchmark

General Notes 1. Architectural floor elevation at Grade Level 0.00 = geodetic elevation 86.52m. Survey information is derived from Murray & Associates survey drawing dated 06 February 2015. 3. All exterior finishes and landscape elements are described in detail on the Landscape drawings.

project code WS / RSA 4. Setting out location has been set to grid lines at residential levels.

> Title Sheet + Data Sheet

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Student Residence

at Brock Commons

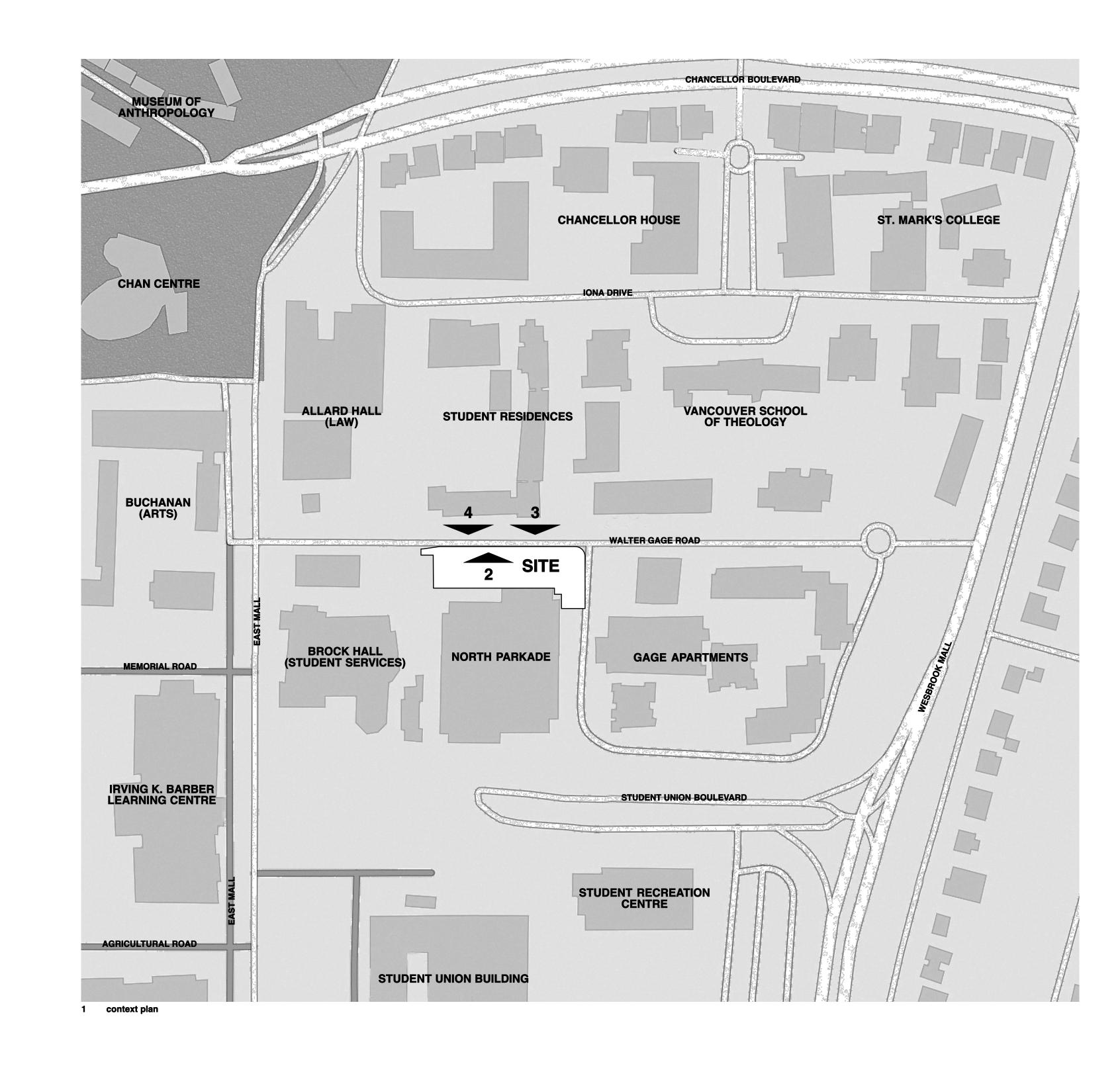
10 Aug 2015

6088 Walter Gage Road

University of British Columbia

111 E 8 Avenue Vancouver BC Canada V5T 1R8 t 604.739.3344 f 604.739.3355 info@actonostry.ca

drawing number A0.01 🔨









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6088 Walter Gage Road University of British Columbia

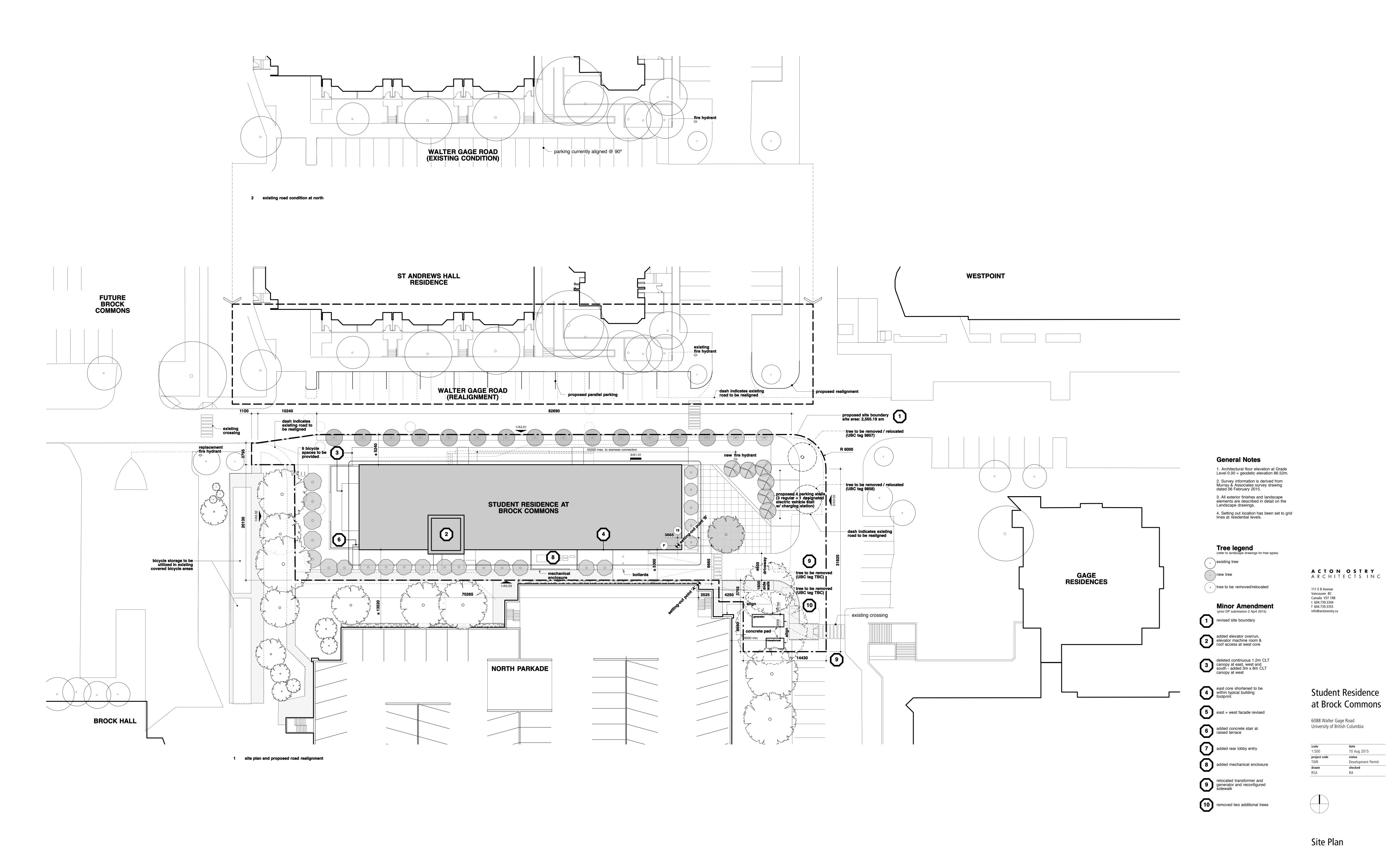
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Site Context

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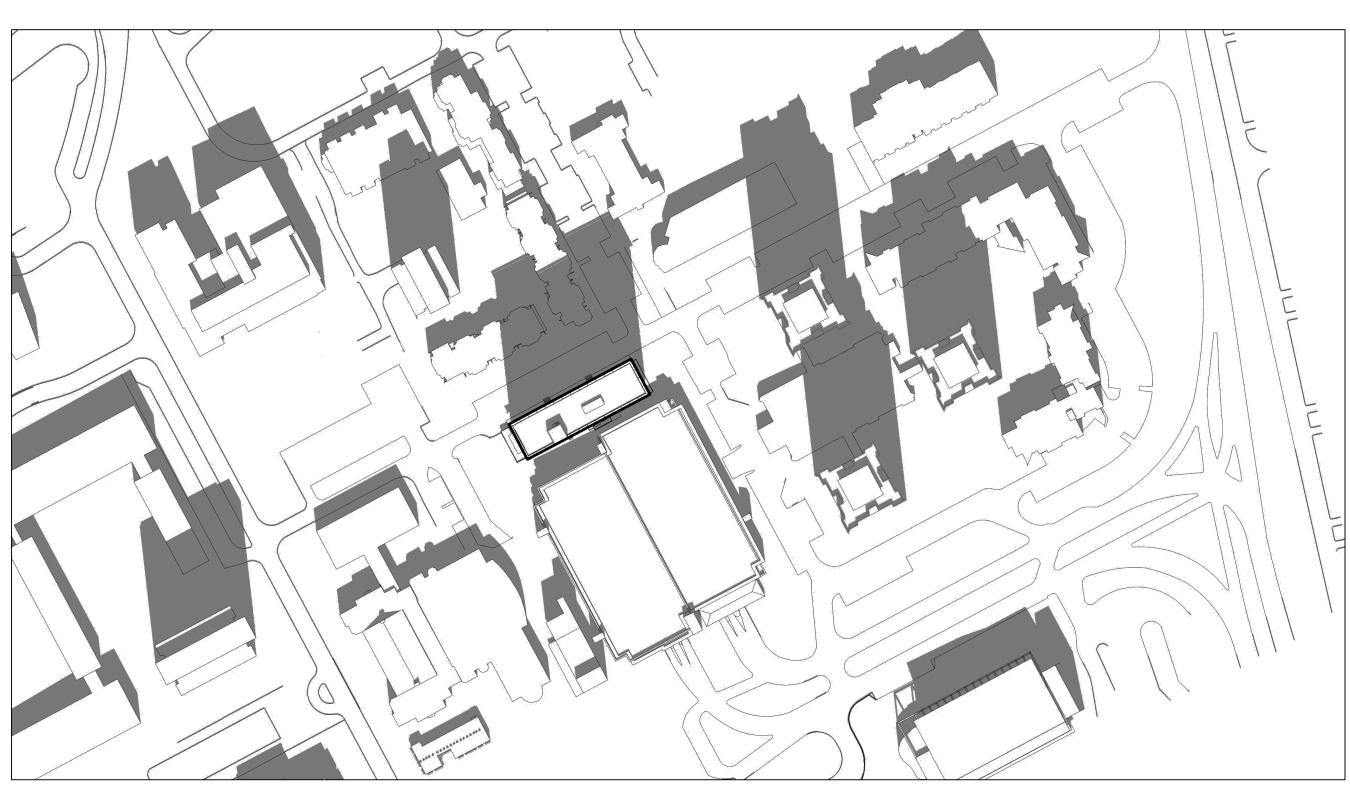
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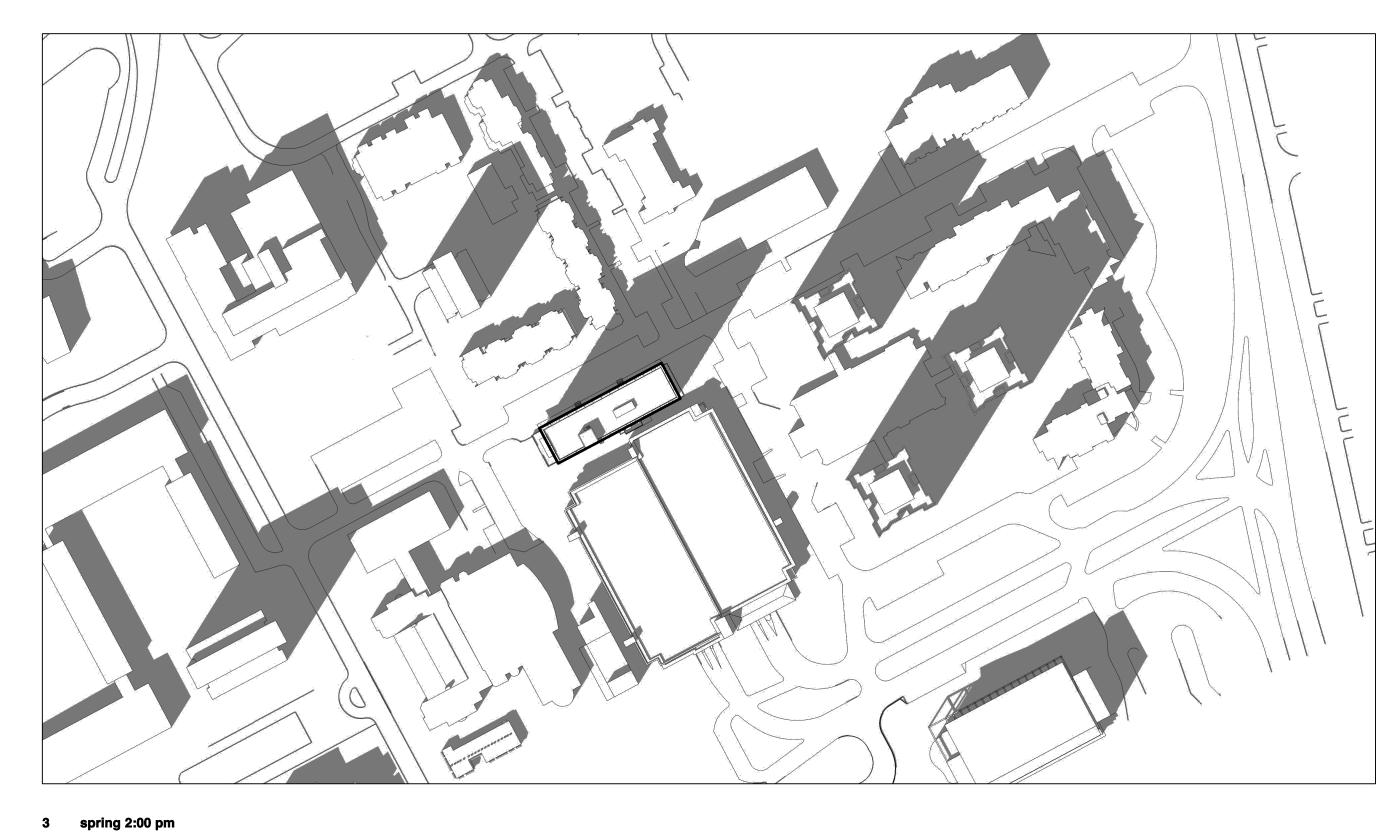
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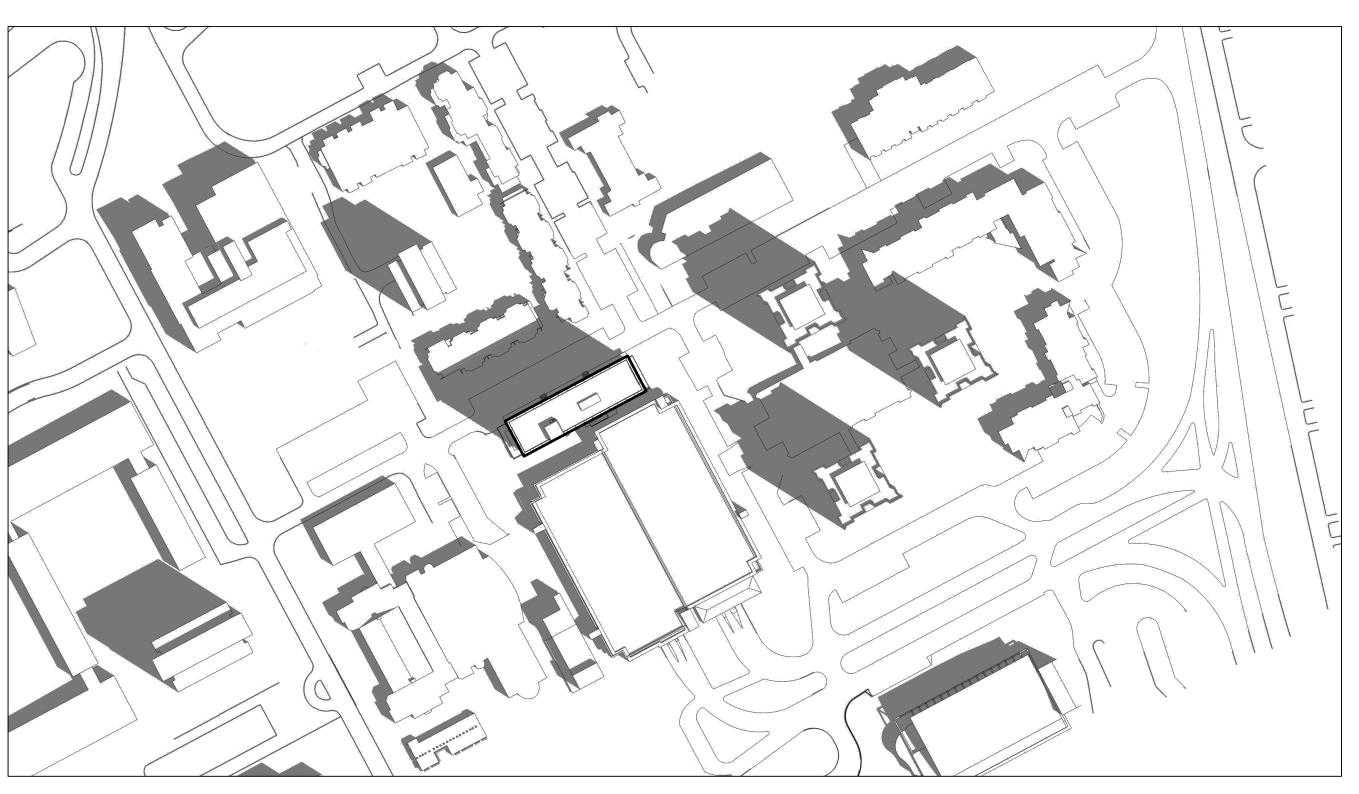


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5 summer 12:00 pm

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project code TWR **drawn** RSA

10 Aug 2015

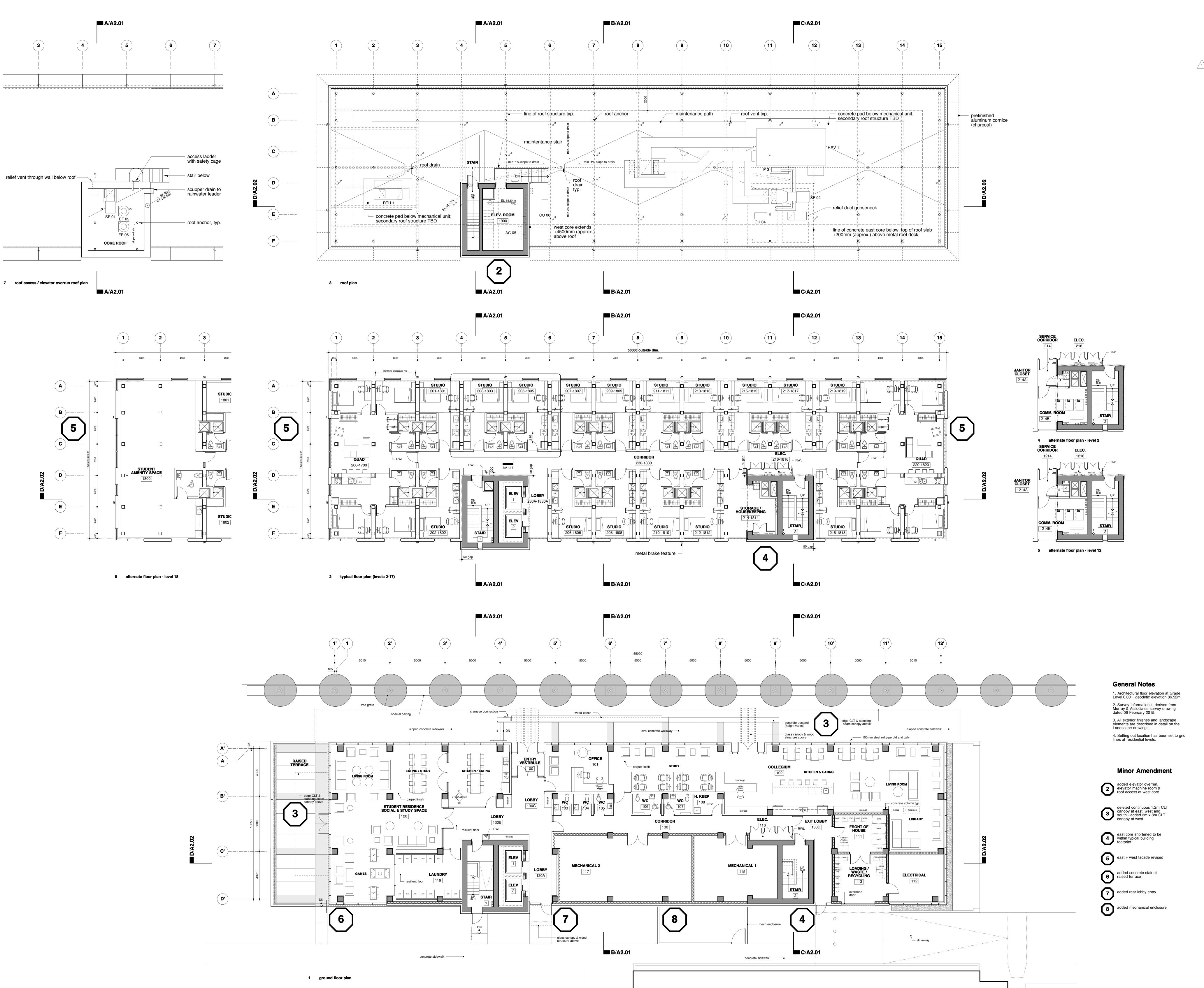
status

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Shadow Analysis

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Vancouver BC
Canada V5T 1R8

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f 604.739.3355

info@actonostry.ca

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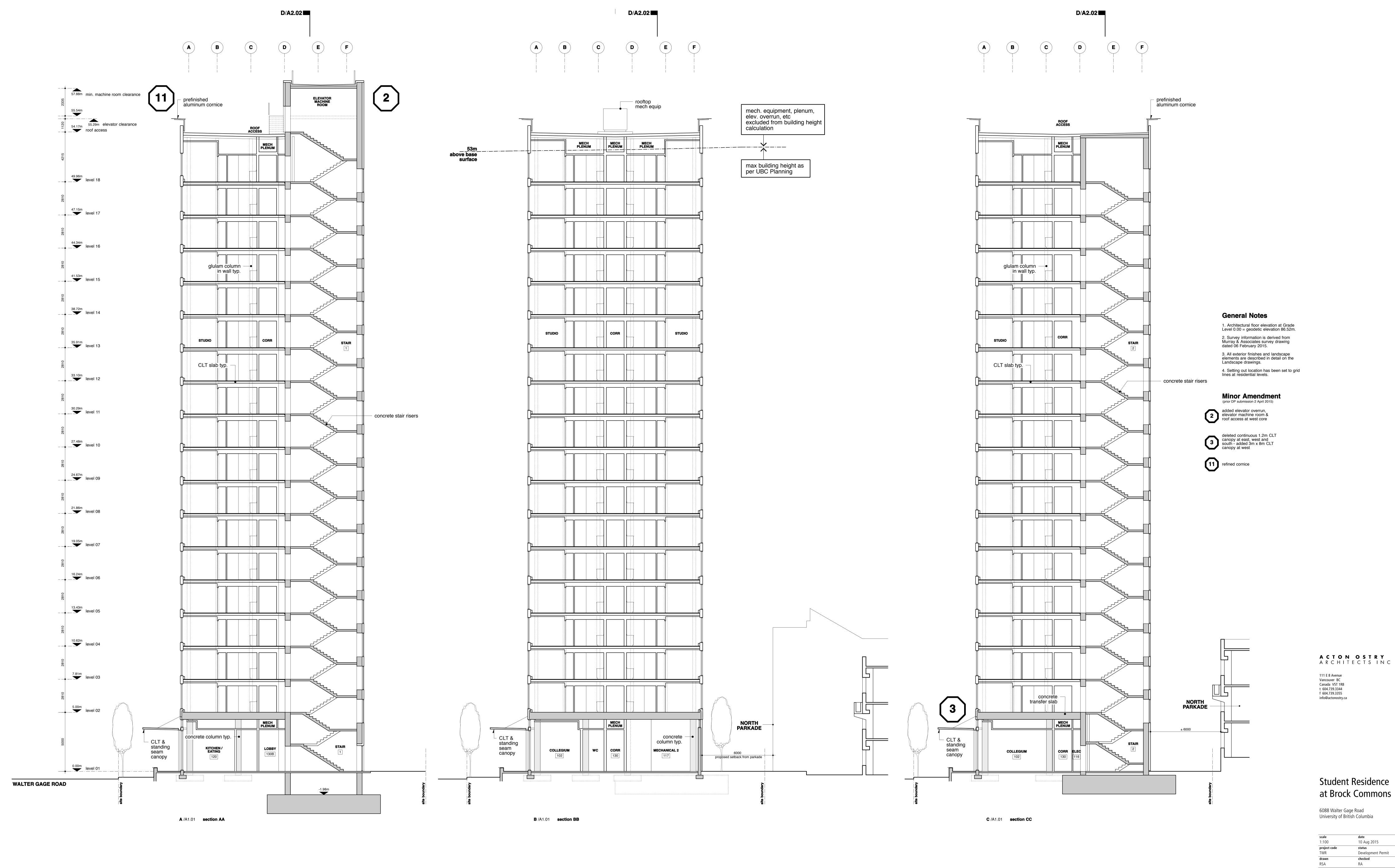
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Floor Plans

drawing number

A1.01



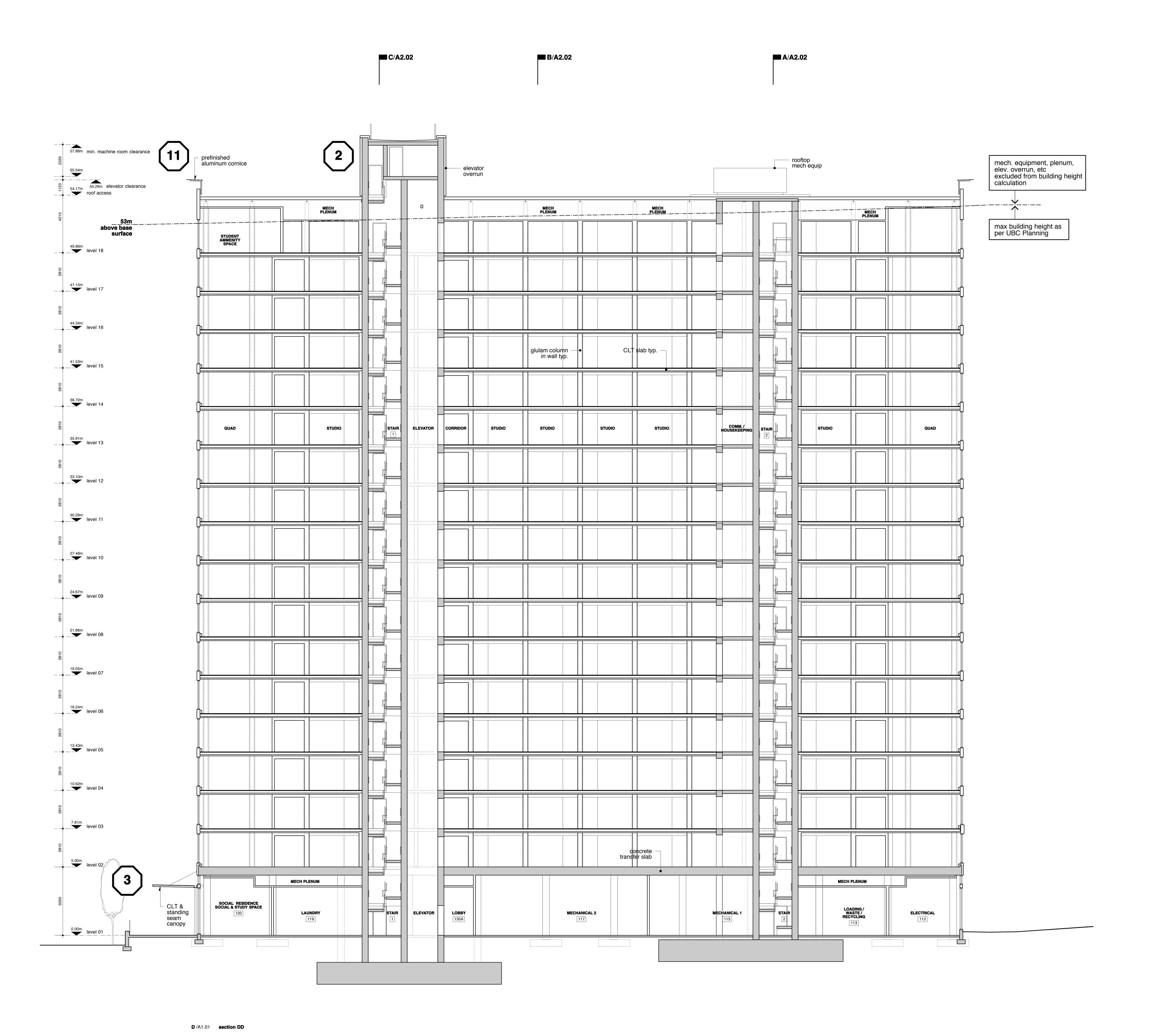
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Sections

drawing number A2.01

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General Notes Architectural floor elevation at Grade Level 0.00 = geodetic elevation 86.52m.

Survey information is derived from Murray & Associates survey drawing dated 06 February 2015. All exterior finishes and landscape elements are described in detail on the Landscape drawings. Setting out location has been set to grid lines at residential levels.

Minor Amendment (prior DP submission 2 April 2015)

- added elevator overrun, elevator machine room & roof access at west core
- deleted continuous 1.2m CLT canopy at east, west and south added 3m x 8m CLT canopy at west
- 11 refined cornice

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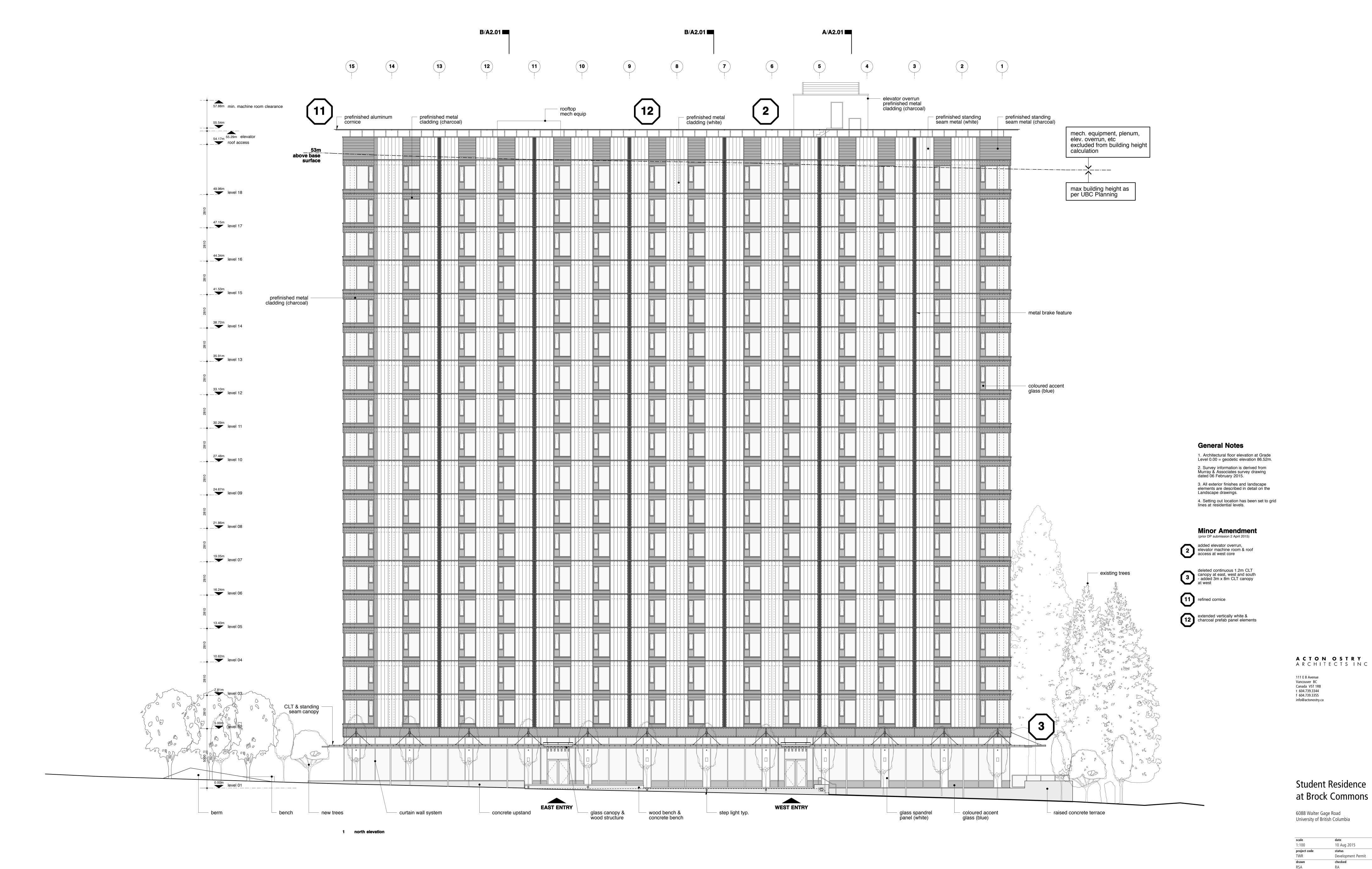
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Sections

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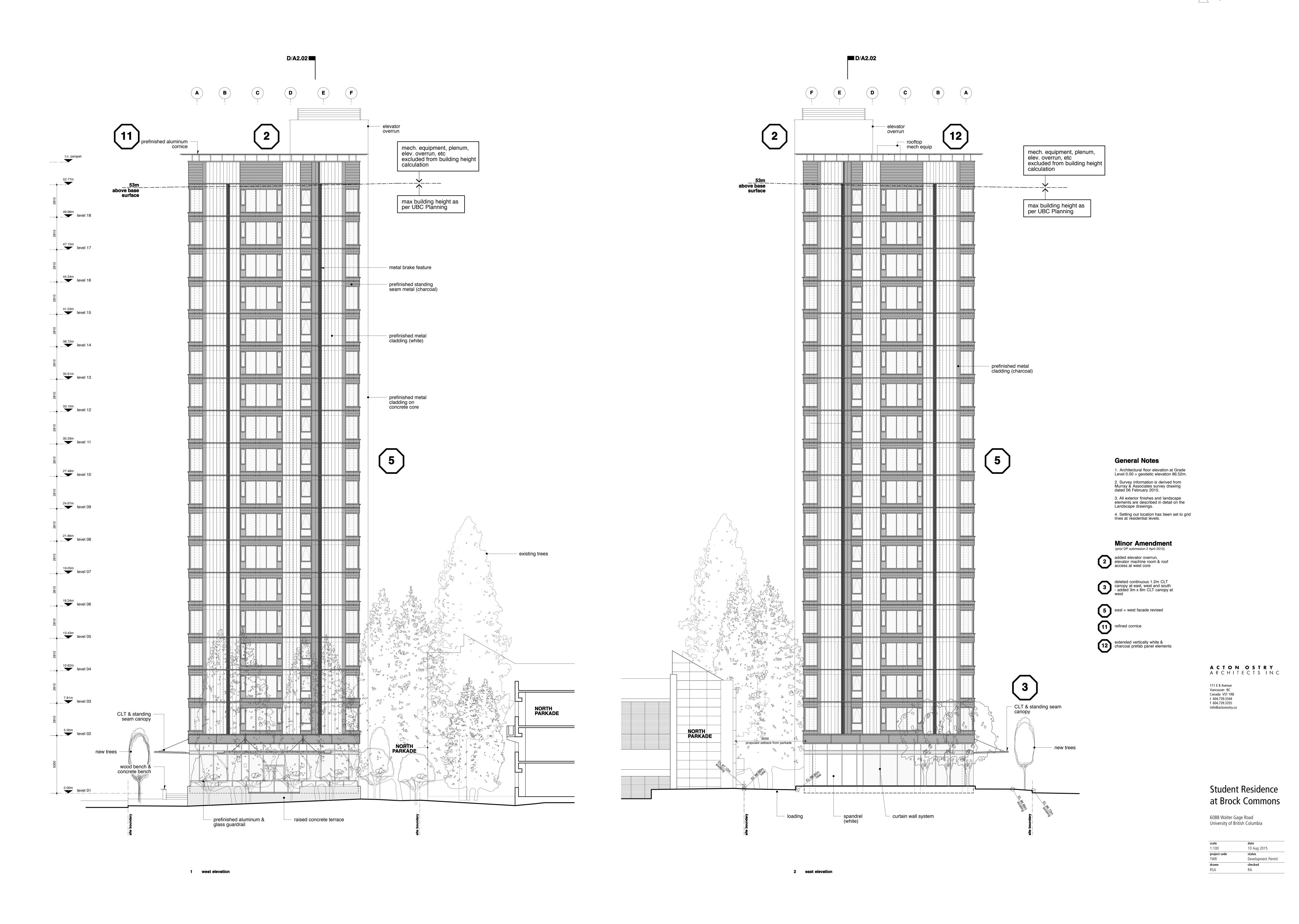
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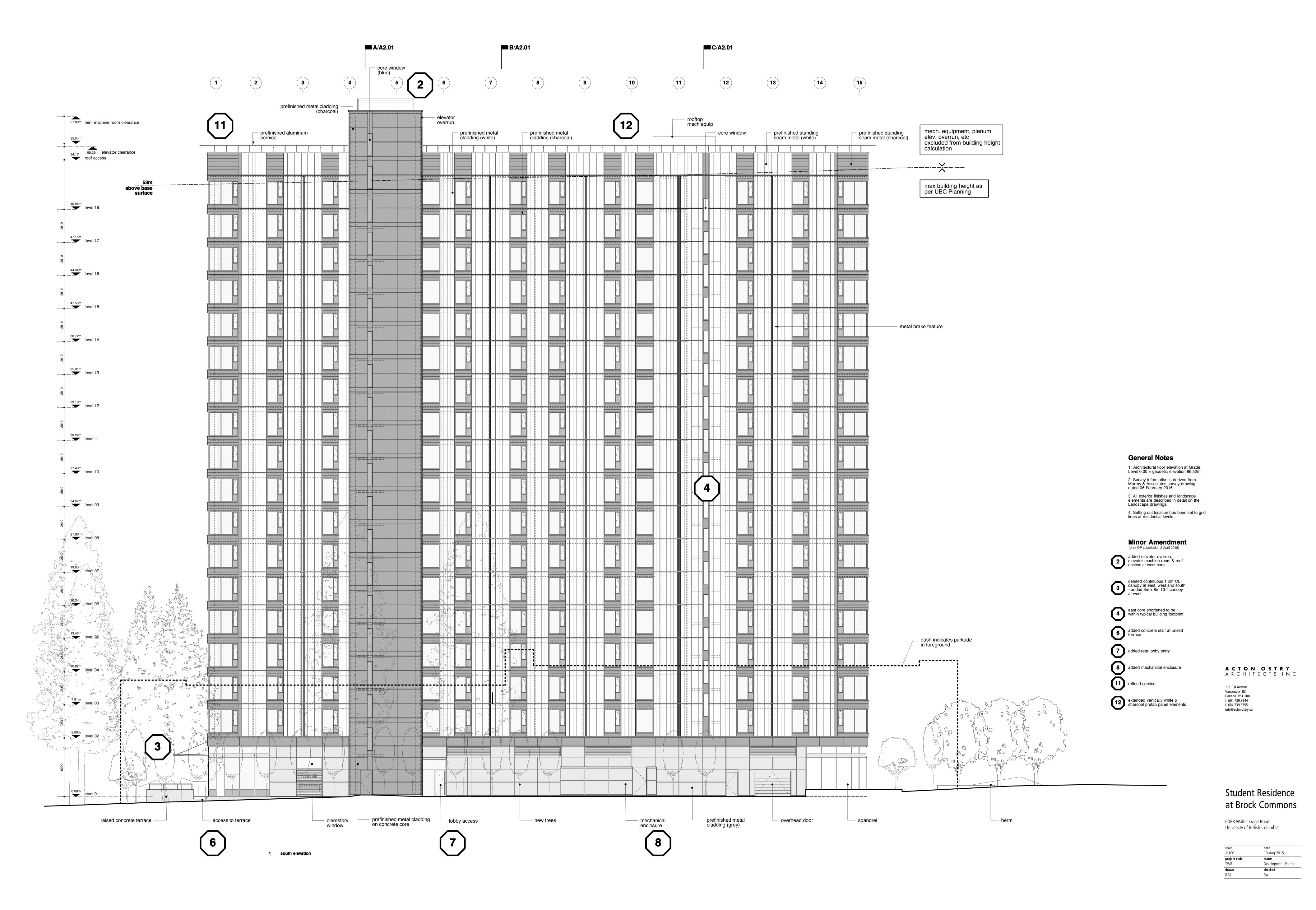
Elevations

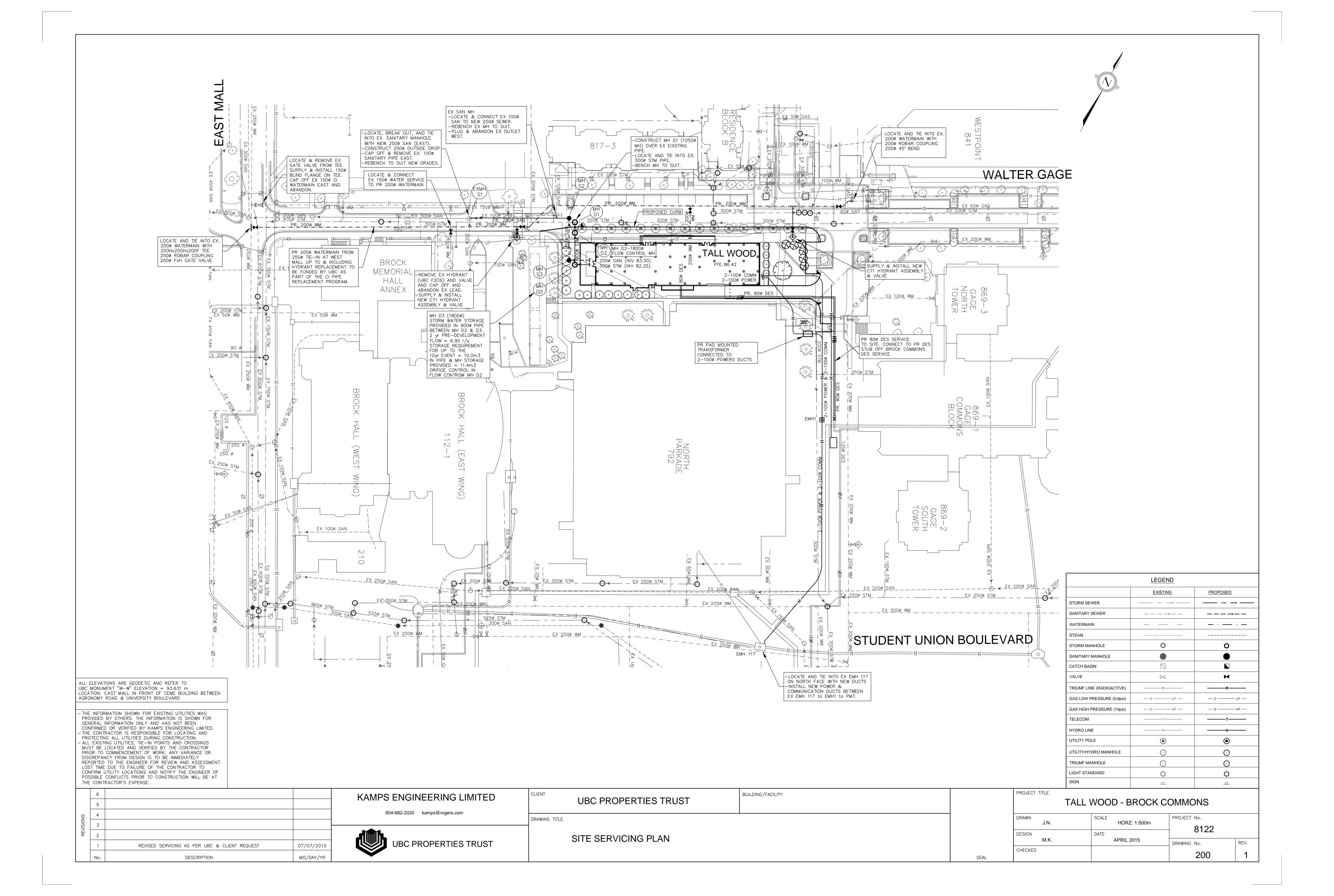
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DESIGN RATIONALE

CAMPUS POCKET PLAZAS

SOUTH ELEVATION

Scale 1:200

There are two small plazas (east and west) that act as social book ends for the project. The east end of the site provides an open public plaza integrating future pedestrian circulation as well as encouraging social interaction between residents, other students, faculties and visitors at UBC. The space will be universally accessible and flexible to accommodate different needs, where one can sit solo at the bench and study with a laptop computer or relax in a small group on the lawn under the cherry trees.

The west end of the site provides an outdoor patio surrounded by a grove of trees that extends from the building. This semi-private "outdoor living room" will create opportunities for residents within the building to socialize and create a place of belonging for residents.

CONTEMPORARY WEST COAST WOODLAND

A large portion of the landscape planting area is covered by native trees, shrubs and groundcovers inspired by Pacific Spirit Park, evoking the surrounding environment and revealing materials used for the building. The west and south sides of the site are planted by a West Coast forest edge planting palette such as vine maples and dogwood trees with native and adopted shade loving ground covers.

The east plaza holds a single Douglas fir tree as a symbol of the coniferous West Coast forest while providing contrast to the mounded lawn and cherry trees.

HIGH AND LOW TECH ENVIRONMENTAL SUSTAINABILITY

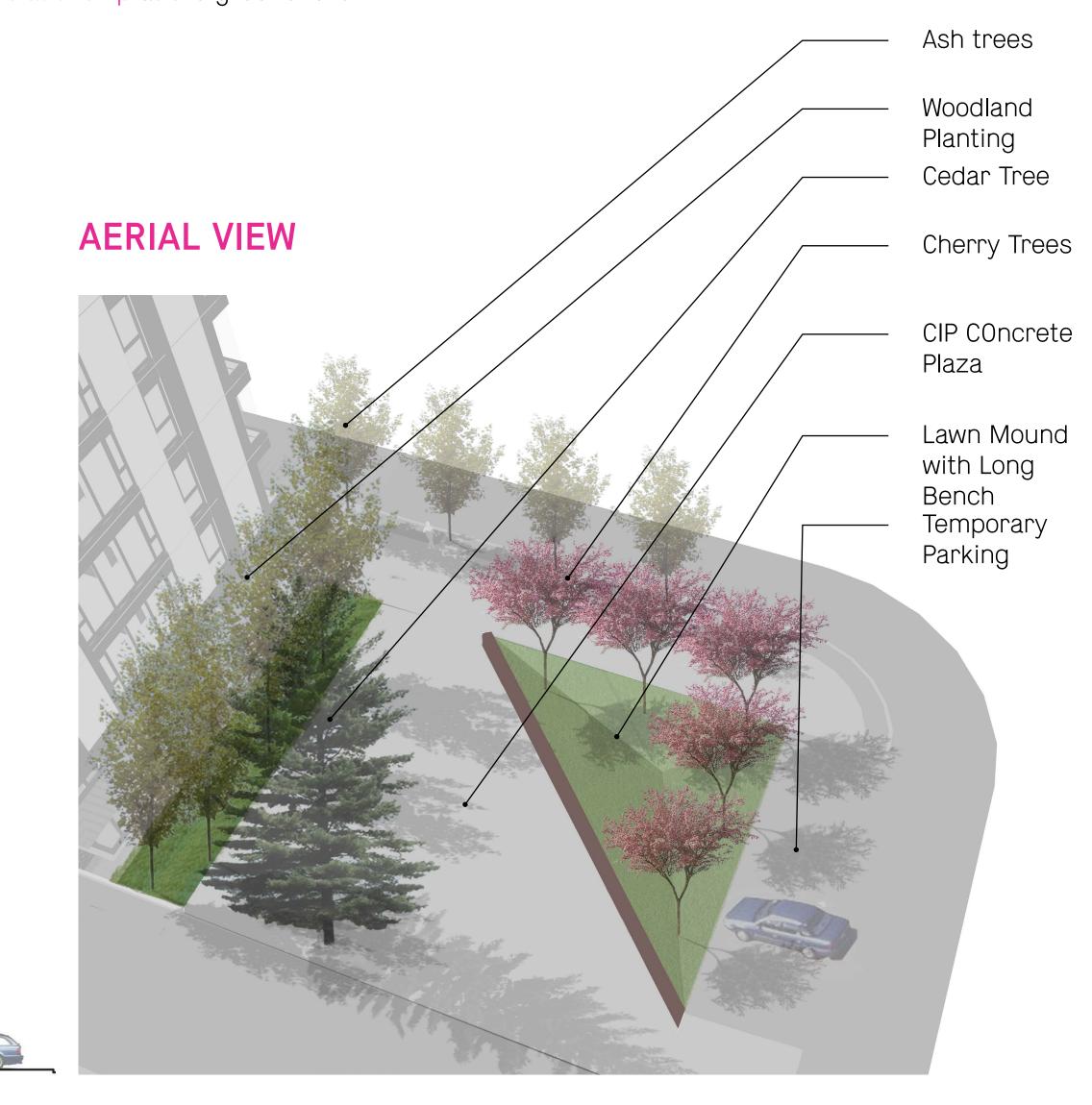
Sustainability will be presented in both high and low technological forms in this project. While the building showcases significant opportunity for sustainable building practices, in contrast the sustainable landscape will be expressed in a low tech approach. This includes native and adopted woodland planting ideal for low water usage (lowered irrigation), storm water reduction, lower maintenance, and habitat contribution. The site furnishings and hardscape materials selection are both sensitive to local and recycled materials where possible.

604 909 4150

CEPTED

Exterior design considerations address safety and security of users through landscape lighting, planting and casual monitoring. landscape lighting will be accommodated through pedestrian level lights located along the Walter Gage Road and pathway North of the North Parkade. Higher lighting levels are proposed at East plaza with tree uplights for Cherry trees and Doug fir tree. Tree canopies and shrub layers will be designed to maintain open lines of sight between 1.2m and 2.5m above grade.

Sightlines are provided through the site from the above-grade suites overlooking the plazas, Walter Gate Road and pathways as well as from the streets. This is further supported through a strong indoor-outdoor relationship at the ground level.



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DP Revision 1

Issued for DP Amend. Jul. 10, 2015

July 23, 2015

Apr. 02, 2015

Student Residence at Brock Commons 6088 Walter Gage Road University of British Columbia

Rationale

Existing Walkway and Tree

Woodland Planting

Patio

Woodland Planting

Service Lane

Plaza

Mound Temporary Parking

Landscape

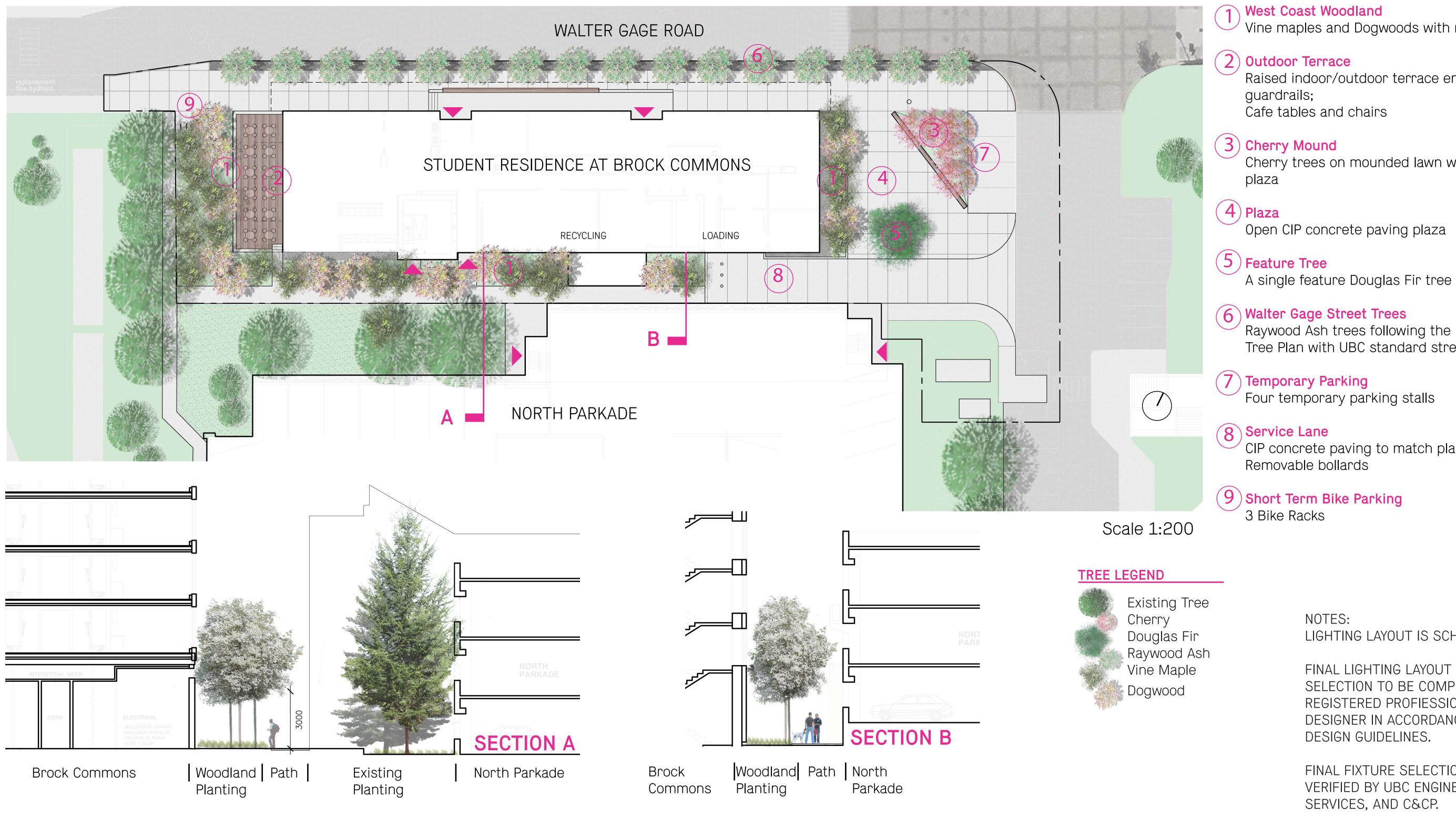
Apr. 02, 2015 1506 Project No.

as noted Drawn|Checked ha | JF

LANDSCAPE SITE PLAN

150

POLYSTICHUM MUNITUM



West Coast Woodland Vine maples and Dogwoods with native ferns

2) Outdoor Terrace

Raised indoor/outdoor terrace enclosed with guardrails; Cafe tables and chairs

HAPA Landscape Architecture Urban Design

403 - 375 West Fifth Avenue Vancouver BC, V5Y 1J6 604 909 4150

hapacobo.com

(3) Cherry Mound

Cherry trees on mounded lawn with long bench facing plaza

Open CIP concrete paving plaza

5 Feature Tree

6 Walter Gage Street Trees Raywood Ash trees following the UBC Campus Street Tree Plan with UBC standard street lights

7 Temporary Parking Four temporary parking stalls

8 Service Lane CIP concrete paving to match plaza and sidewalk; Removable bollards

9 Short Term Bike Parking 3 Bike Racks

> NOTES: LIGHTING LAYOUT IS SCHEMATIC ONLY.

FINAL LIGHTING LAYOUT AND FIXTURE SELECTION TO BE COMPLETED BY REGISTERED PROFIESSIONAL LIGHTING DESIGNER IN ACCORDANCE WITH UBC DESIGN GUIDELINES.

FINAL FIXTURE SELECTION TO BE VERIFIED BY UBC ENGINEERING SERVICES, AND C&CP.

S-01: (9) ROADWAY LIGHT STANDARD, LUXEON T LED BAR, 58W/6000 LUMEN, -15' HT.WITH NEW BASES AND POLES,

S-03: SPECIAL LIGHTING: (6) FOCUSED SPOTLIGHT FOR TREE FOLIAGE, LIGMAN UTAH 2 LED 3W, 4000K, PRODUCT TBD.

S-02: (8) ILLUMINATED BOLLARD, SENTRY 2868 REBELLE ARCHITECTURAL Copyright Reserved. This drawing is and remains at all times the exclusive property of Hapa Collaborative and cannot be used modified or copied without the expressed ritten consent of the landscape architect.

DP Revision 1

July 23, 2015

Apr. 02, 2015

Issued for DP Amend. Jul. 10, 2015

Student Residence at Brock Commons 6088 Walter Gage Road University of British Columbia

Landscape Rationalė

LIGHTING, MH 100W

T LIST	LIGHTING PLAN

SWORD FERN

#2 POT, 450mm 0.C

PLAI	NT LIS	ST				
SYM	QTYBC	TANICAL NAME	COMMON NAME	PLANTED SIZE		
TREES						
AC	18	ACER CIRCINATUM	VINE MAPLE	2.5-3.0m HT. FIELD GROWN		
CN	15	CORNUS NUTTALLII	PACIFIC DOGWOOD	5 cm CAL. B&B		
FA	18	FLAVINUS ANGUSTIFOLIA 'RAYWOOD'	RAYWOOD ASH	7.0 cm CAL. B&B		
PM	1	PEUDOTSUGA MENZIESII	DOUGLA FIR	2.5m HT. B&B		
Р	5	PSRUNUS SPP	CHERRY	5.0cm CAL. B&B		
0110115						
SHRUE	BS AND G	GROUDCOVERS				
Ac	250	ASARUM CAUDATUM	WILD GINGER	#1 POT, 450mm 0.C.		
At	250	ASPLENIUM SCOLOPENDRUM	HART'S TONGUE FERN	#1 POT, 450mm 0.C.		
Bs	250	BLECHNUM SPICANT	DEER FERN #1 POT, 450mm O.C.			

Apr. 02, 2015 1506 as noted

Drawn|Checked ha | JF

Diamond Head Consulting Ltd. Arborist Report

For:

Student Residence at Brock Commons August 14, 2015

To be submitted with Tree Retention Plan Dated: August 14, 2015

Submitted to:
UBC Properties Trust
c/o
Matt Wood
ACTON OSTRY ARCHITECTS INC
111 E 8 Avenue Vancouver BC

Submitted by:



342 West 8th Avenue Vancouver, BC V5Y 3X2





The following Diamond Head Consulting staff performed the site visit and prepared the report. All general and professional liability insurance and individual accreditations have been provided below for reference.

Max Rathburn

ISA Certified Arborist (PN0599A)
ISA Certified Tree Risk Assessor (159)

This report summarizes the planned management of trees on the site. If there are any questions or concerns as to the contents of this report, please contact us at any time.

Contact Information

Phone: 604-733-4886 Fax: 604-733-4879

Email: max@diamondheadconsulting.com
Website: www.diamondheadconsulting.com

Insurance Information

WCB: # 657906 AQ (003)

General Liability: Northbridge General Insurance Corporation - Policy #CBC1935506,

\$5,000,000 (Mar 2015 to Mar 2016)

Errors & Omissions: Lloyds Underwriters – Policy #1010615D, \$1,000,000 (June 2015 to June

2017)

Table of Contents

TABLE	E OF CONTENTS	I
1.0	INTRODUCTION	1
1.1	Limits of Assignment	1
1.2	Purpose and Use of Report	1
2.0	OBSERVATIONS	2
2.1	Site Overview	2
2.2	Tree Inventory	3
2.3	Photographs	4
2.4	Tree Inventory Table	6
3.0	SUMMARY	7
5.0	CONSTRUCTION GUIDELINES	7
6.0	LIMITATIONS	10
7.0	APPENDIX 1 – OVERALL RISK RATING AND ACTION THRESHOLDS	13
1 * - 1		
LIST (of Tables	

Table 2. Tree Inventory......6

1.0

Diamond Head Consulting Ltd. (DHC) was asked to complete an assessment of the trees on and adjacent to the following proposed development:

Civic address: Student Residence at Brock Commons UBC

Project No.: unknown

Introduction

Client name: UBC Properties Trust

Date of site visit: July 16 2015
Weather during visit: Sunny and dry

The trees as within the scope of the proposed project and as specified by the client were assessed, including: species, diameter at breast height (dbh) measured to the nearest 1 cm at 1.4 m above natural grade (tree's base), estimated height and general health and defects. Critical root zones were calculated for each of the trees with the potential for development impacts. Tree hazards were assessed according to International Society of Arboriculture and WCB standards. Suitability for tree retention was evaluated based on the health of the trees and their location in relation to the proposed building envelopes and infrastructure. This report outlines the existing condition of the trees on and adjacent to the property, summarizes the proposed tree removals and retention trees as well as suggested guidelines for protecting the remaining trees during the construction process.

1.1 Limits of Assignment

- Our investigation is based solely on our visual inspection of the trees on July 16, 2015
- Our inspection was conducted from ground level. We did not conduct soil tests or below root examination to assess the condition of the root system of the trees.
- Only the three subject trees were assessed, no other trees have been assessed.

1.2 Purpose and Use of Report

 Provide documentation pertaining to only the three trees as directed by Acton Ostry Architects Inc.

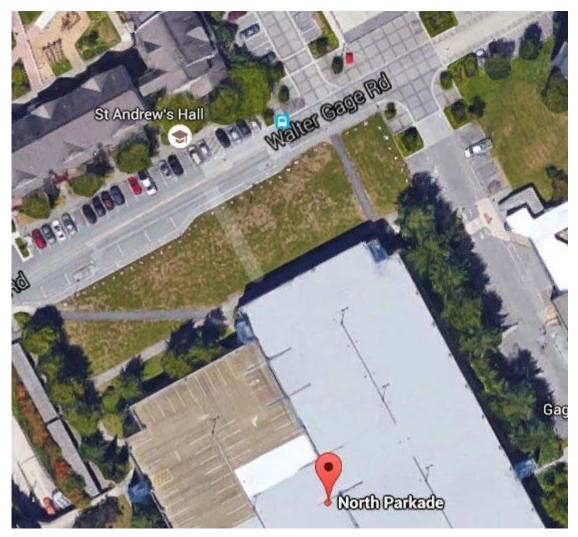


Figure 1. Location of subject site – is adjacent to the North Parkade at UBC

2.0 Observations

2.1 Site Overview

The proposed development is adjacent the North Parkade, and this study focuses only three tree growing within a planting berm adjacent the Parkade. No other trees were assessed for this study. Subject tree attributes, critical root zones and recommendations for the trees are listed below in **Table 1**.

2.2 Tree Inventory

The following is an inventory of assessed trees: tree species, characteristics, comments, recommendations and required root protection zones have been suggested (Table 1). Their locations are illustrated on the accompanying map.

Overall Health and Structure Rating

- **Excellent** = Tree of possible specimen quality, unique species or size with no discernible defects. Or a heritage tree.
- Normal = Trees are in fair to good condition, considering its growing environment and species.
- **Poor** = Trees have low vigour, with noted health and/or structural defects. This tree is starting to decline from its typical species growth habits.
- **Very poor** = Trees are in serious decline from its typical growth habits, with multiple very definable health and/or structural defects.
- **Dead/Dying** = Trees were found to be dead, and/or have severe defects and are in severe decline.
- **High Risk** = Trees have been deemed hazardous by a Certified Tree Risk Assessor utilizing CTRA methods. They have a probability of failure of 3 or higher with a total overall risk rating of 8 (Moderate 3) or above.

Tree Risk Assessment

Using the *Tree Risk Assessment in Urban Areas and the Urban/Rural Interface Release 1.4* manual, published by the International Society of Arboriculture, a Risk Rating out of 12 maximum points was given to the tree as shown in Table 2. The formula used was: **Probability of Failure + Size of Part + Target Area = Tree Risk Assessment (Rating).**

In the Tree Risk Assessment, the tree was rated as follows:

Probability of Failure = (1 low to 5 Extreme). This is the likelihood of branch or whole tree failure. One is the lowest possible score; five is the highest likelihood of tree part failure.

Size of Defective Part = (1 small to 3 large). This section identifies the largest part, which could fail. A part greater than 50 cm is given a rating of 3, a part between 10 and 50 cm is given a rating of 2 and all parts less than 10 cm are given a rating of 1.

Target Area = (1 low to 4 high). The target that the tree could strike is designated a value from 1 to 4 based on the potential to cause personal injury or damage structures and infrastructure.

A value for each of the three categories is assessed and added together in the Risk Rating calculation shown in Table 2. A score of 3-5 indicates a low risk, 6-8 is a moderate risk, 9-11 is a high risk and 12 indicates an extreme risk; this level warrants immediate tree removal. A risk category assigning ranges to the three levels of risk is also provided. Please refer to the table in

Appendix 1 for detailed information on interpretation and implications of risk ratings and categories.

2.3 Photographs



Photo 1. Showing the three subject trees.

Photo 2. Tree #1 is growing adjacent current hardscape



Photo 3. Tree # 2, is the northern edge tree in the row.

Photo 4. Tree #1872 has large surface root sprawling down both sides of the berm.

2.4 Tree Inventory Table

Table 1. Tree Inventory.

Tag#	Common Name	Botanical Name	DBH (cm)	Ht (m)	Overall Condition	Comments	Retain/ Remove	Retention Comments	TPZ (m)
1 (no UBC tag)	Douglas-fir	Pseudotsuga menziesii	51	14	Normal	This tree is growing in between two existing sidewalks.	Remove	This tree is in conflict with the design that includes a driveway, sidewalk other hardscape features.	4m
2 (no UBC tag)	Douglas-fir	Pseudotsuga menziesii	42	14	Normal	This tree is growing at the edge of a tree row, on top of a berm. There are large surface roots extending to the north and south, as well as to the extents of the berm (retaining wall to west and sidewalk to east)	Remove	This tree is in conflict with the design that includes a, sidewalk other hardscape features.	4m
UBC tag# 1872	Douglas-fir	Pseudotsuga menziesii	41	14	Normal	This tree is growing in a tree row, on top of a berm. There are large surface roots extending to the north and south, as well as to the extents of the berm (retaining wall to west and parking lot curb to east)	Retain	Protect as required. Note any changes to the adjacent grade of the berm should be assessed by the project arborist to determine if the tree can be retained.	4m

-(

3.0 Summary

This study inventoried 3 subject trees in relation to the proposed development. Two of the trees are recommended to be removed to accommodate the development, and one tree is recommended for retention. Tree protection measures have been recommended to ensure this tree is adequately protected.

5.0 Construction Guidelines

The following are recommendations for risk mitigation and proper tree protection during the construction phase of the project.

Tree Retention Zones

Eight times the diameter was used in consideration to determine the optimal root protection zone (RPZ) and Tree Protection Zone (TPZ) setbacks, and adjusted to suit the specific needs of the tree and site conditions. **The optimal root protection zone is to be measured in the field from the outer edge of the stem of the tree.** The RPZ is the area around the tree in which no grading or construction activity may occur without project arborist approval and is required for the tree to retain good health and vigor.

The following are tree preservation guidelines and standards for the RPZs:

- No soil disturbance or stripping;
- The natural grade shall be maintained within the protection zone;
- No storage, dumping of materials, parking, underground utilities or fires;
- Any plan affecting trees should be reviewed by a consultant including demolition, erosion control, improvement, utility, drainage, grading, landscape, and irrigation;
- Special foundations, footings and paving designs are required if within the tree protection zone;
- Utilities should be routed around the RPZ;
- Excavation within the tree protection zone should be supervised by a consulting arborist:
- Surface drainage should not be altered so as to direct water into or out of the RPZ; and
- Site drainage improvements should be designed to maintain the natural water table levels within the RPZ.

•

Respecting these guidelines will prevent changes to the soil and rooting conditions, wounding of the trees and contamination due to spills and waste. Any plans for work or activities within the RPZ that are contrary to these guidelines should be discussed with the project arborist so that mitigation measures can be implemented.

Tree Protection Fences

Prior to any construction activity on site, tree protection fences must be constructed at the specified distance from the tree trunks. The protection barrier or temporary fencing must be at least 1.2 m in height and constructed of 2 by 4 lumber with orange plastic mesh screening. This must be constructed prior to tree removal, excavation or construction and remain intact throughout the entire period of construction.

Unsurveyed Trees

Trees that are identified by DHC on the Tree Retention Plan, and within this report as unsurveyed trees have been hand plotted for approximate location only. Their location and ownership cannot be confirmed without being surveyed. The property owner or project developer must ensure that all relevant on and off site trees are surveyed by a legally registered surveyor, whether they are identified by DHC or not.

Removal of logs from sites

Private timber marks are required for the transporting logs from private-owned land in the province of BC. It is the owner of the properties responsibility to apply for a timber mark prior to the removal of any merchantable timber from the site. Additional information can be found at:

http://www.for.gov.bc.ca/hth/private-timber-marks.htm

Regulation of Soil Moisture and Drainage

The excavation and construction activities adjacent to the RPZs can influence the moisture availability to the subject trees. This is due to a reduction in the total rooting mass, changes in drainage conditions and changes in exposure including reflected heat from adjacent hard surfaces. To mitigate these concerns the following guidelines should be followed:

- Soil moisture conditions within the tree protection zones should be monitored during hot and dry weather. When soil moisture conditions are dry, supplemental irrigation should be provided. Irrigation should wet the soil to the depth of the root system (approximately 30 cm deep).
- Any planned changes to the surface grades within the RPZ, including the placement of mulch, should be designed so that the water will flow away from the tree trunks.
- Excavation adjacent to trees can alter the soils hydrological processes by draining the
 water faster than it had naturally. It is recommended that when excavating within 6 m
 of any tree, the site be irrigated more frequently to account for this.

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Tree Pruning

All heavy machinery (excavators, cranes, dump trucks, etc.) working within five meters of tree crowns should be made aware of their proximity to the tree. If there is to be a sustained period of machinery working within five meters of the tree crowns, a line with colored flags should be suspended at the height of the crowns along the length of the protected tree area. If there are concerns regarding the clearance required for machinery and workers within the tree protection zone, or just outside of it, the project arborist should be consulted so that a pruning prescription can be developed or a zone surrounding the crowns can be established. Any wounds incurred to the subject trees during construction should be reported to the project arborist immediately.

Fertilization

Fertilization or root zone enhancement treatments may be recommended by the project arborist during the construction phase.

Paving Within and Adjacent to Tree Protection Zones

If the development plans propose the construction of paved areas and/or retaining walls close to the proposed tree protection zones measures should be taken to minimize impacts. Construction of these features would raise concerns regarding proper aeration, drainage, irrigation and opportunities for adequate root growth. The following design and construction guidelines are recommended be followed to minimize the long-term impacts to trees if any paving or retaining walls are necessary:

- Any excavation activities near the TPZ (tree protection zone) should be monitored by a
 Certified Arborist. Excavation should remove and disturb as little of the rooting zone as
 possible and all roots greater than 2 cm in diameter should be hand pruned.
- The natural grade of the rooting zone should be maintained. Any retaining walls should be designed at heights that will maintain the existing grade to within 20 cm of its current level. If the grade is altered, it should be raised not reduced in height.
- The long-term health of the tree is directly dependent on the volume of available, below ground growing space. If the RPZ must be compromised, the planned distance of structures from the trunks of the subject trees should not be closer than 50% of the RPZ on more than two sides of the tree.
- Compaction of sub grade materials can cause the trees to develop shallow rooting systems. This can contribute to long-term damage to pavement surfaces as the roots grow. Minimizing the compaction of sub grade materials using structural soils and increasing the strength of the pavement reduces the reliance on sub grade for strength.
- If it is not possible to minimize the compaction of sub grade materials, subsurface barriers should be considered to help direct roots downward into the soil and prevent them from growing directly under the paved surfaces.

Plantings within the TPZs

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If there are plans to landscape the ground within the TPZ, measures should be taken to minimize impacts. It is not recommended that the existing grass layer be stripped, as this will damage the surface roots. The grass layer should be covered with mulch at the start of the project, which will gradually kill the grass while moderating soil moisture and temperatures. Topsoil should be mixed with the mulch prior to planting of shrubs; however the depth of this new topsoil layer should not exceed 20 cm. Planting should take place within the newly placed topsoil mixture and should not disturb the original rooting zone of the trees. Two meters around the base of each tree should be left unplanted and covered in mulch.

Monitoring During Construction

Ongoing monitoring should be provided for the duration of the project. Site visits should be more frequent during activities that are higher risk, including the first stages of construction when excavation occurs adjacent to the trees. Site visits will ensure contractors are respecting the recommended tree protection measures and will allow the arborist to identify any new concerns that may arise.

During each site visit the following measures will be assessed and reported on:

- The integrity of the Tree Protection Zone and fencing;
- Changes to TPZ limits including: overall maintenance, parking on roots, and storing or dumping of materials within TPZ. If failure to maintain and respect TPZ is observed, suggestions will be made to ensure tree protection measures are upheld;
- Review and confirmation of recommended tree maintenance including root pruning, irrigation, mulching and branch pruning;
- Health and condition of each tree;
- Damage to trees that may have resulted from construction activities will be noted, as will the health of branches, trunks and roots of protected trees. Recommendations for remediation will follow;
- Changes to soil moisture levels and drainage patterns; and
- Factors that may be detrimentally impact the trees.

All findings and recommendations will be documented in a summary report. All concerns will be highlighted along with recommended mitigation measures.

6.0 Limitations

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related thereto both generally and as instruments of professional service.

4. Conditions affecting the trees subject to this report (the "Conditions", including without limitation structural defects, scars, decay, fungal fruiting bodies, evidence of insect attack, discoloured foliage, condition of root structures, the degree and direction of lean, the general condition of the tree(s) and the surrounding site, and the proximity of property and people) other than those expressly addressed in this report may exist. Unless otherwise stated: information contained in this report covers only those Conditions and trees at the time of inspection; and the inspection is limited to visual examination of such Conditions and trees without dissection, excavation, probing or coring. While every effort has been made to ensure that the trees recommended for retention are both healthy and safe, no guarantees, representations or warranties are made (express or implied) that those trees will remain standing or will not fail. The Client acknowledges that it is both professionally and practically impossible to predict with absolute certainty the behaviour of any single tree, or groups of trees, in all given circumstances. Inevitably, a standing tree will always pose some risk. Most trees have the potential

for failure and this risk can only be eliminated if the risk is removed. If Conditions change or if additional information becomes available at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary. Diamond Head expressly excludes any duty to provide any such modification of Conditions change or additional information becomes available.

- 5. Nothing in this report is intended to constitute or provide a legal opinion, and Diamond Head expressly disclaims any responsibility for matters legal in nature (including, without limitation, matters relating to title and ownership of real or personal property and matters relating to cultural and heritage values). Diamond Head makes no guarantee, representation or warranty (express or implied) as to the requirements of or compliance with applicable laws, rules, regulations, or policies established by federal, provincial, local government or First Nations bodies (collectively, "Government Bodies") or as to the availability of licenses, permits or authorizations of any Government Body. Revisions to any regulatory standards (including by-laws, policies, guidelines an any similar directions of a Government Bodies in effect from time to time) referred to in this report may be expected over time. As a result, modifications to the findings, conclusions and recommendations in this report may be necessary. Diamond Head expressly excludes any duty to provide any such modification if any such regulatory standard is revised.
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- 8. Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.
- 9. Loss or alteration of any part of this report invalidates the entire report.

7.0 Appendix 1 – Overall risk rating and action thresholds

The Overall Risk Rating and Action Thresholds

Risk Rating	Risk Category	Interpretation and Implications
3	Low 1	Insignificant - no concern at all.
4	Low 2	Insignificant - very minor issues.
5	Low 3	Insignificant - minor issues not of concern for many years yet.
6	Moderate 1	Some issues but nothing that is likely to cause any problems for another 10 years or more.
7	Moderate 2	Well defined issues - retain and monitor. Not expected to be a problem for at least another 5 - 10 years.
8	Moderate 3	Well defined issues - retain and monitor. Not expected to be a problem for at least another 1 - 5 years.
9	High 1	The assessed issues have now become very clear. The tree can still reasonably be retained as it is not likely to fall apart right away, but it must now be monitored annually. At this stage it may be reasonable for the risk manager/owner to hold public education sessions to inform people of the issues and prepare them for the reality that part or the entire tree has to be removed.
10	High 2	The assessed issues have now become very clear. The probability of failure is now getting serious, or the target rating and/or site context have changed such that mitigation measures should now be on a schedule with a clearly defined timeline for action. There may still be time to inform the public of the work being planned, but there is not enough time to protracted discussion about whether or not there are alternative options available.
11	High 3	The tree, or a part of it has reached a stage where it could fail at any time. Action to mitigate the risk is required within weeks rather than months. By this stage there is not time to hold public meetings to discuss the issue. Risk reduction is a clearly defined issue and although the owner may wish to inform the public of the planned work, he/she should get on with it to avoid clearly foreseeable liabilities.
12	Extreme	This tree, or a part of it, is in the process of failing. Immediate action is required . All other, less significant tree work should be suspended, and roads or work areas should be closed off, until the risk issues have been mitigated. This might be as simple as removing the critical part, drastically reducing overall tree height, or taking the tree down and cordoning off the area until final clean up, or complete removal can be accomplished. The immediate action required is to ensure that the clearly identified risk of harm is eliminated. For areas hit by severe storms, where many extreme risk trees can occur, drastic pruning and/or partial tree removals, followed by barriers to contain traffic, would be an acceptable first stage of risk reduction. There is no time to inform people or worry about public concerns. Clearly defined safety issues preclude further discussion.

The Table shown above outlines the interpretation and implications of the risk ratings and associated risk categories. This table is provided to inform the reader about these risk categories so that they can better understand any risk abatement recommendations made in the risk assessment report.

