# APPENDIX C
# PRELIMINARY CONCEPTUAL STRUCTURE PLAN OPTIONS & FEEDBACK

# CONCEPTUAL STRUCTURE PLAN OPTIONS

This appendix details the preliminary options developed for the Conceptual Structure Plan and the feedback received.

## 1 PRELIMINARY OPTIONS

In response to the site conditions and UBCO's vision for the West Campus Lands, the design team developed three Preliminary Structure Plan Concepts shown in Figures 1 through 3 opposite.

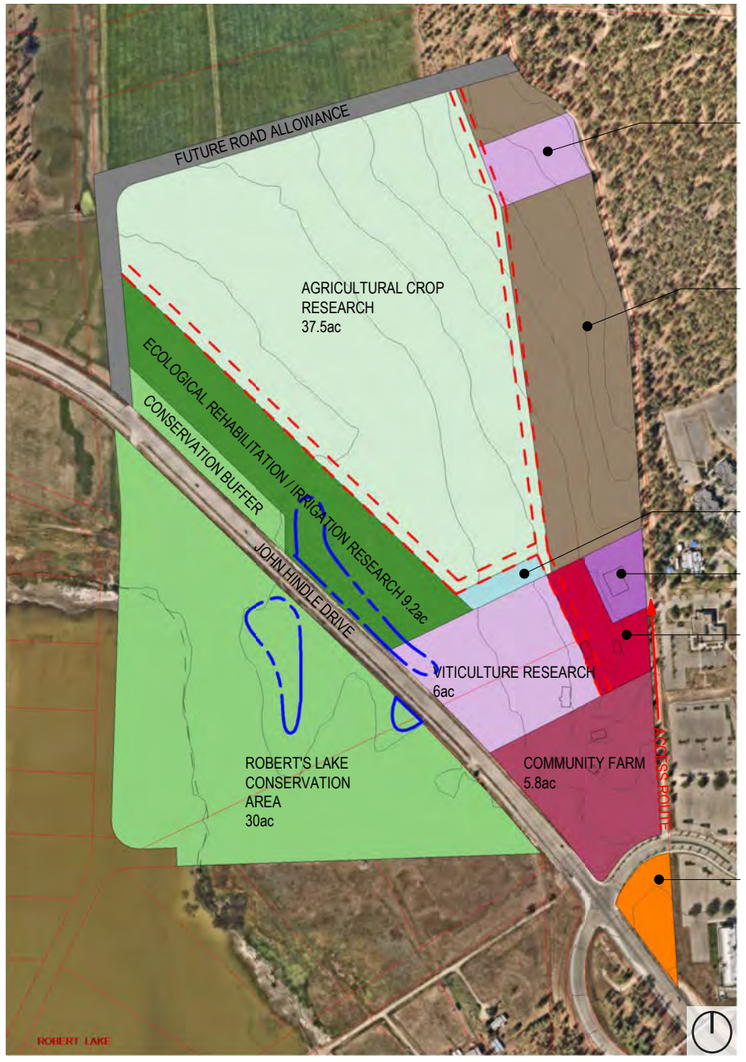
### 1.1 COMMON APPROACH AND APPLICABLE USES

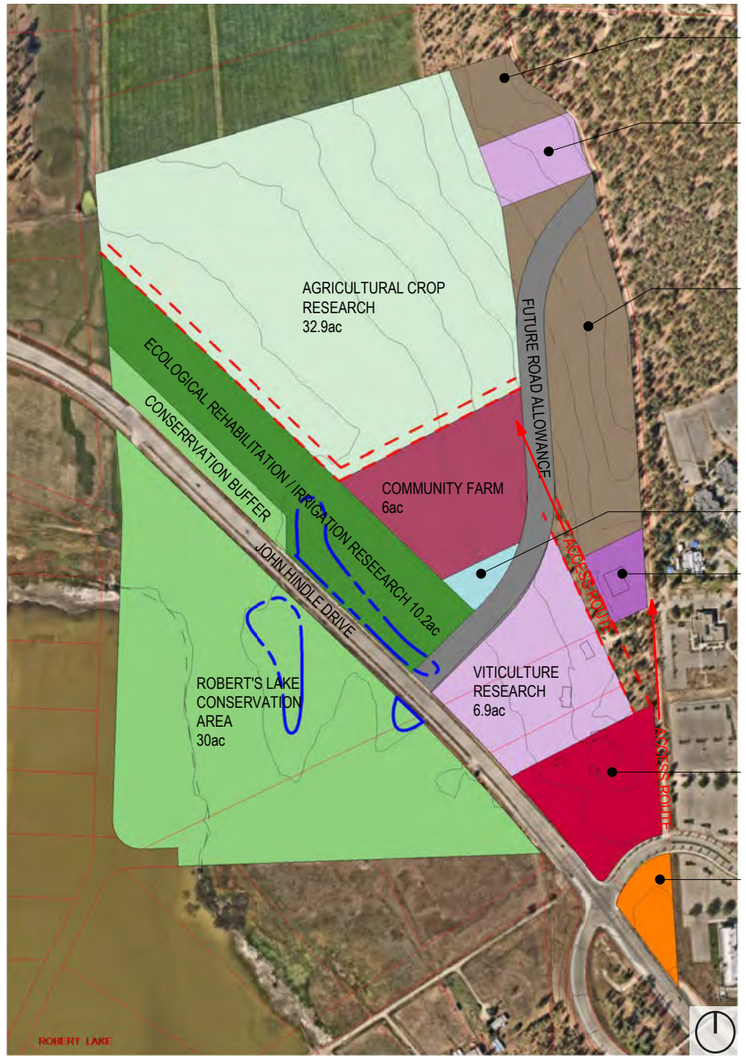
Each of the three Preliminary Structure Plan Concept options breaks the West Campus Lands into the following key use areas:

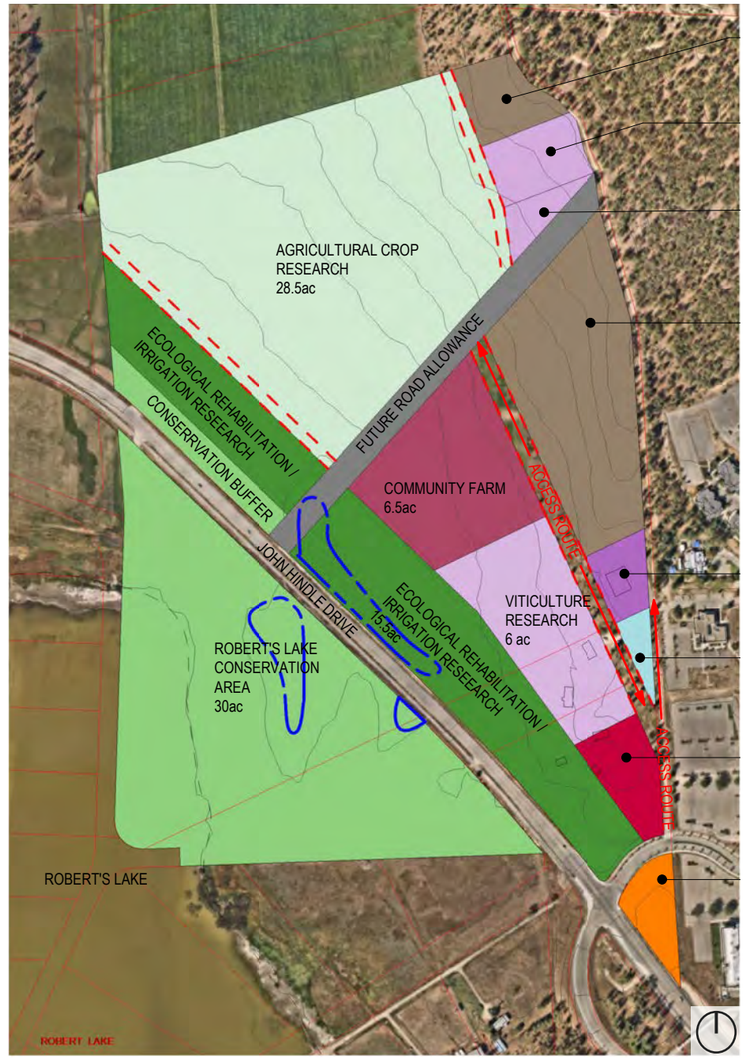
- **Operation Hub:** A support area for common equipment and materials required by UBC to support activities in the West Campus Lands.
- **Community Hub:** A publicly accessed zone for community and student formal and informal education and support services.
- **Community Farm Zone:** A publicly accessed zone for agriculture based community uses.
- **Robert Lake Conservation Area:** A limited access zone for the rehabilitation and conservation of the sensitive Robert Lake ecosystem.
- **Ecological Rehabilitation & Irrigation Research Zone:** A limited access zone for research activities particularly associated with the boundaries between different ecosystems.
- **Agricultural Crop Research Zone:** A limited access zone for general agricultural crop research.
- **Viticulture and Experimental Winery Zone:** A limited access zone for viticulture research.
- **Coniferous Woodland:** A limited access zone associated with the Environmentally Sensitive Area (ESA 2) Coniferous Woodland to support ecological and agricultural research activities.

The arrangement of these elements in each option varies based on the proposed location of the future city roadway connection through the site and potential connections to the Main Campus and surrounding areas.

A following is a detailed description of the three preliminary options, including benefits and challenges of each.




**FIGURES 1-3:** Preliminary Structure Plan Options

## 1.2 PRELIMINARY STRUCTURE PLAN CONCEPT OPTION 1

### General Concept and Site Organization

In Preliminary Concept Option 1, the potential future City road connection is located along the northern and western perimeter of the site to maximize the useable area within the West Campus Lands and allow for internal planning flexibility. This arrangement allows for larger contiguous areas for agricultural crop research in the north and central areas of the site (Development Area C). This area could be divided into different research plots as required. Directly to the west of the agricultural crop research zone, is an area identified for ecological research activities, focussed around ecological rehabilitation and irrigation research, in support of the larger research efforts on the West Campus Lands.

The north-eastern side of the site (Development Area D), characterized by sloped landscapes and coniferous woodland, would be developed sensitively to the area's ecology, maintaining the existing orchard area and considering sympathetic uses such as micro-forestry or agro-ecology research in the woodland areas.

The south-eastern end of the site (Development Area E) is best positioned for infrastructure and access connections with the Main Campus, includes already developed land and is characterized by mild to moderate soil limitations. Given these conditions, this area is proposed to host an operational research hub with potential areas of specific research use such as viticulture, agrovoltaics and an experimental winery, located close to the operational hub for best efficiency. With the easy access to the Main Campus, and in particular, a parking lot, this zone could also host a community farm, accessible to public.

Development Area F, south of Upper Campus Way, is ideally sited to accommodate a ommunity hub, with a community or academic building with direct connection to the Main Campus.

Development Areas A and B, to the south-west of John Hindle Drive would be identified as a conservation area. Given the uniqueness and extreme sensitivity of this environment, conservation and rehabilitation efforts should be prioritized in this zone, with an additional buffer allowed for to the north of the John Hindle Drive.

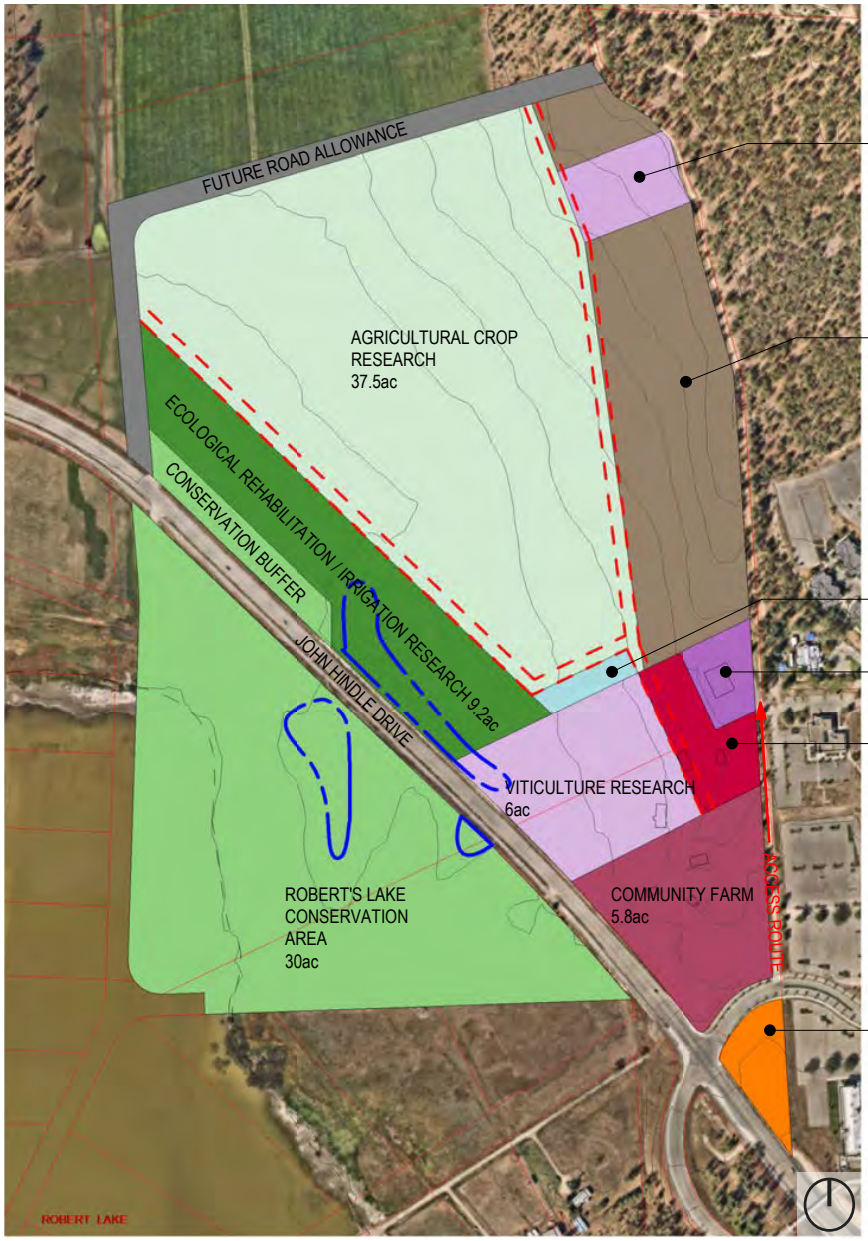
### Benefits and Challenges

The primary benefits to Preliminary Concept Option 1 are:

- The flexibility of planning research in the central portion of the site due to the proposed location of the future city road.
- The strong potential connection, for circulation and services between the Research/Operational Hub and the existing plant growth facility as well as the Main Campus.
- The consolidation of public use functions (Community Farm and Community Hub) with ease of access to the Main Campus and its services (e.g. parking) as well as public roads.
- The opportunity of the Community Hub and Farm to act as a new public gateway to the Main Campus.

The primary challenges to Preliminary Concept Option 1 are:

- Traffic volumes to the Community Farm and Community Hub may need to be considered for potential affect on Upper Campus Way.
- There may be a conflict between the archaeological area of potential and the proposed new road in the north east corner of the site.




**FIGURES 4:** Preliminary Structure Plan Option 1

Lot Boundaries

Internal Access Route

Archaeological AOP (Area of Potential)

Potential Future Road Covenant to Quail Ridge

## 1.3 PRELIMINARY STRUCTURE PLAN CONCEPT OPTION 2

### General Concept & Site Organization

Preliminary Concept Option 2 places the potential future City road connection generally following the UBCO preferred route, with minor refinements. This road alignment cuts through the site and could be used for connection between program elements. This option creates a large open field crop research area in the north-central portion of the site (Development Area C). A community farm is also located in Development Area C, taking advantage of potential access off the future city road. The final zone of Development Area C would be focused around ecological research including ecological rehabilitation and irrigation research.

Specific dedicated research activities, such as viticulture research and an experimental winery, are primarily located in Development E in already disturbed zones. This area would also include the operations hub, supporting all the West Campus Lands. This location is ideal as it allows for connections to both the Main Campus and the future City road.

The north-eastern side of the site (Development Area D) characterized by sloped landscape and coniferous woodland, would be developed sensitively to the area ecology, maintaining the existing orchard area and considering sympathetic uses such as micro-forestry or agro ecology research in the woodland areas.

Development Areas A and B, to the south-west of John Hindle Drive would be identified as a conservation area. Given the uniqueness and extreme sensitivity of this environment, conservation and rehabilitation efforts should be prioritized in this zone, with an additional buffer allowed for to the north of the John Hindle Drive.

Development Area F, south of Upper Campus Way, is ideally sited to accommodate a community hub, with a community or academic building(s) with direct connection to the Main Campus.

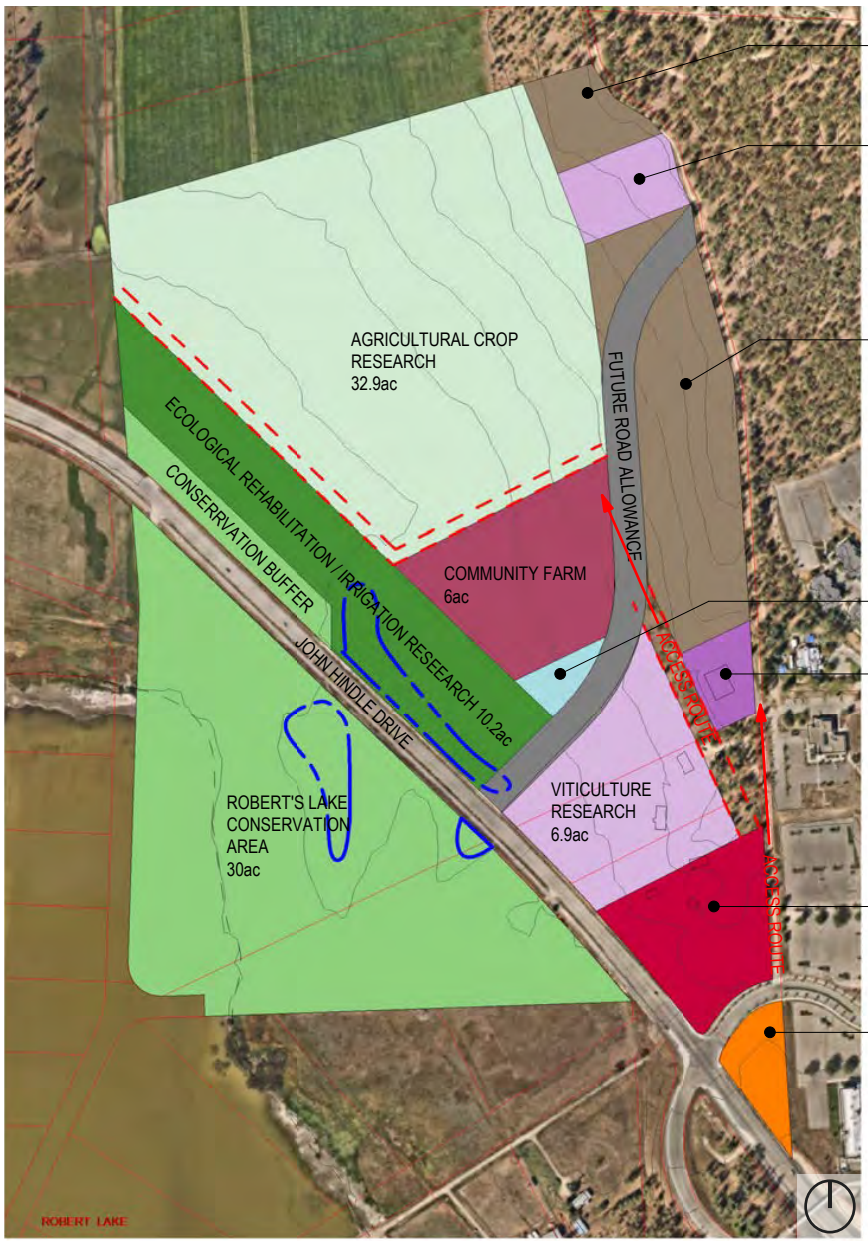
### Benefits and Challenges

The primary benefits to Preliminary Concept Option 2 are:

- A more centralized and consolidated research and academic area with connections to the Main Campus and potential additional access created with the future City road alignment.

The primary challenges to Preliminary Concept Option 2 are:

- A reduced area available for agricultural crop research.
- The placement of the future City road bisects the site, and creates more complex shapes to work with, reducing contiguous area for use.
- The public uses of the site (Community Farm and Community Hub) are not co-located. This increases public circulation on the site in multiple areas.
- If the future city public road does not proceed, the location of the publicly accessed Community Farm would need to reconsidered.




MICRO FORESTRY
AGRO FORESTRY
AGRO ECOLOGY / PERMACULTURE RESEARCH

EXISTING ORCHARD
1.8ac

CONIFEROUS WOODLAND:
MICRO FORESTRY
AGRO FORESTRY
AGRO ECOLOGY / PERMACULTURE RESEARCH
10ac

AGRI VOLTAICS
0.5ac

EXISTING RESEARCH
GREENHOUSE

OPERATIONAL HUB
EXPERIMENTAL WINERY

EXPERIMENTAL WINERY
& EQUIPMENT STORAGE
(OPERATIONAL HUB)
4.3ac

COMMUNITY HUB
HEALTH PROMOTION PROGRAMMING & SERVICES
CLIMATE HUB

**FIGURES 5:** Preliminary Structure Plan Option 2

Lot Boundaries

Internal Access Route

Archaeological AOP (Area of Potential)

Potential Future Road Covenant to Quail Ridge

## 1.4 PRELIMINARY STRUCTURE PLAN CONCEPT OPTION 3

**General Concept & Site Organization**

Preliminary Concept Option 3 proposes a more direct future City road connection from John Hindle Drive, which is a refinement of the City preferred orientation. This road alignment drives the arrangement of uses in Development Area C. This option creates a smaller open field crop research area in the north-central portion of Development Area C. A community farm is also located in this zone, taking advantage of potential access off the future city road. The final zone within Development Area C would be focused around ecological research including ecological rehabilitation and irrigation research. This zone extends beyond Development Area C all along the northern side of John Hindle Drive.

Specific dedicated research activities, such as viticulture research and an experimental winery, are organized in a long linear zone through the centre of the site, crossing Development Areas C, D and E, giving a cross section of soil conditions for study.

The operational hub is located in Development Area E with easy access to the Main Campus as well as to the specific dedicated research activity zones for efficiency.

The north-eastern side of the site (Development Area D), characterized by sloped landscape and coniferous woodland, would be developed sensitively to the area ecology, maintaining the existing orchard area and considering sympathetic uses such as micro-forestry or agro-ecology research in the woodland areas. In this option, the future City road connection would separate the orchard from other potential tree based research to the south.

Development Areas A and B, to the south-west of John Hindle Drive would be identified as a conservation area. Given the uniqueness and extreme sensitivity of this environment, conservation and rehabilitation efforts should be prioritized in this zone, with an additional buffer allowed for to the north of the John Hindle Drive.

Development Area F, south of Upper Campus Way, is ideally sited to accommodate a community hub, with a community or academic building with direct connection to the Main Campus.

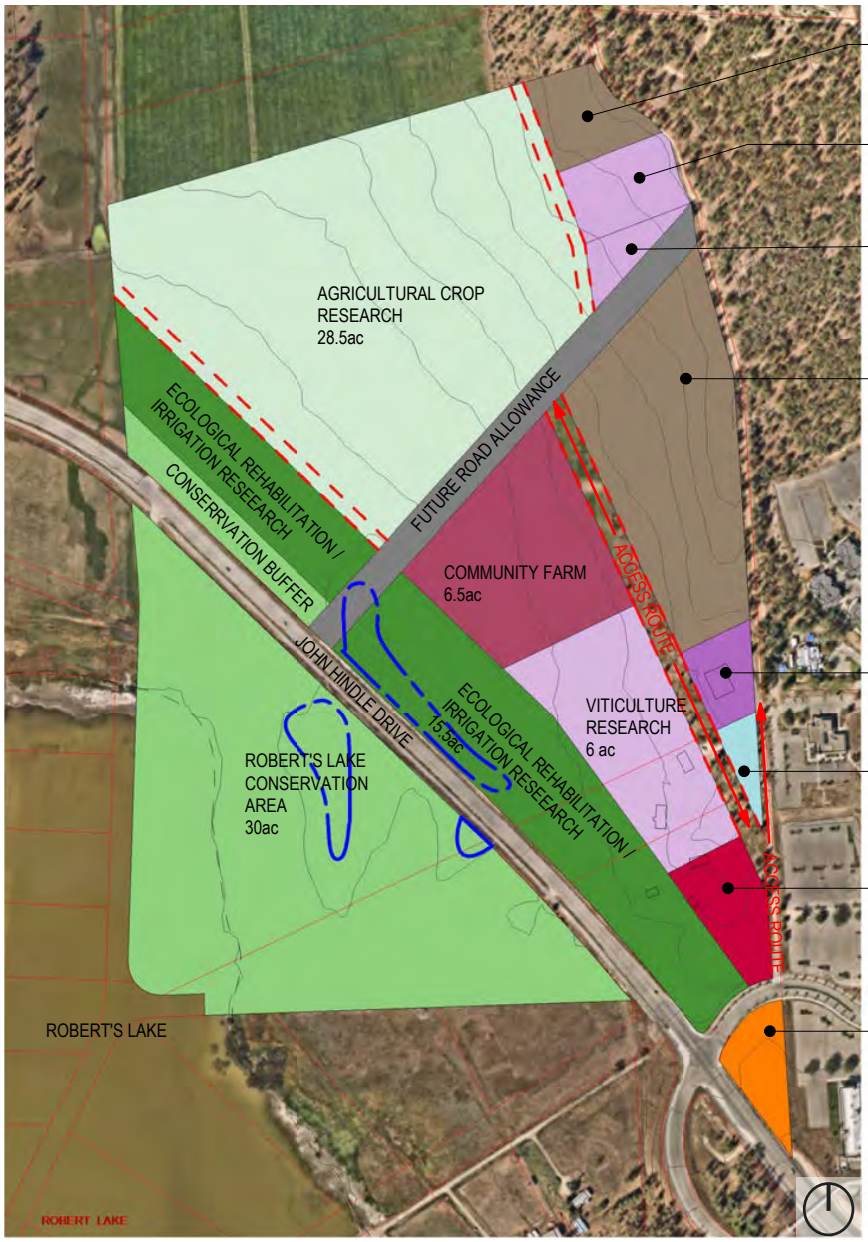
**Benefits and Challenges**

The primary benefits to Preliminary Concept Option 3 are:

- Larger area available for ecological research.
- Specific dedicated research activity areas are co-located with access to the Main Campus and Operations Hub, however, they are spread out in a linear fashion.

The primary challenges to Preliminary Concept Option 3 are:

- A reduced area available for agricultural crop research.
- The placement of the future City road bisects the site, reducing contiguous area for use.
- The public uses of the site (Community Farm and Community Hub) are not co-located. This increases public circulation on the site in multiple areas.
- If the future city public road does not proceed, the location of the publicly accessed Community Farm would need to reconsidered.




**FIGURES 6:** Preliminary Structure Plan Option 3

Lot Boundaries

Internal Access Route

Archaeological AOP (Area of Potential)

Potential Future Road Covenant to Quail Ridge

## 1.5 PRELIMINARY STRUCTURE PLAN CONCEPT OPTIONS FEEDBACK

The original three Preliminary Structure Plan Concept options were workshopped with the UBCO Working Group to develop a simplified version of Option 3 (Figure 7). UBC used this simplified option to obtain feedback from stakeholders to guide the development of the preferred Conceptual Structure Plan.

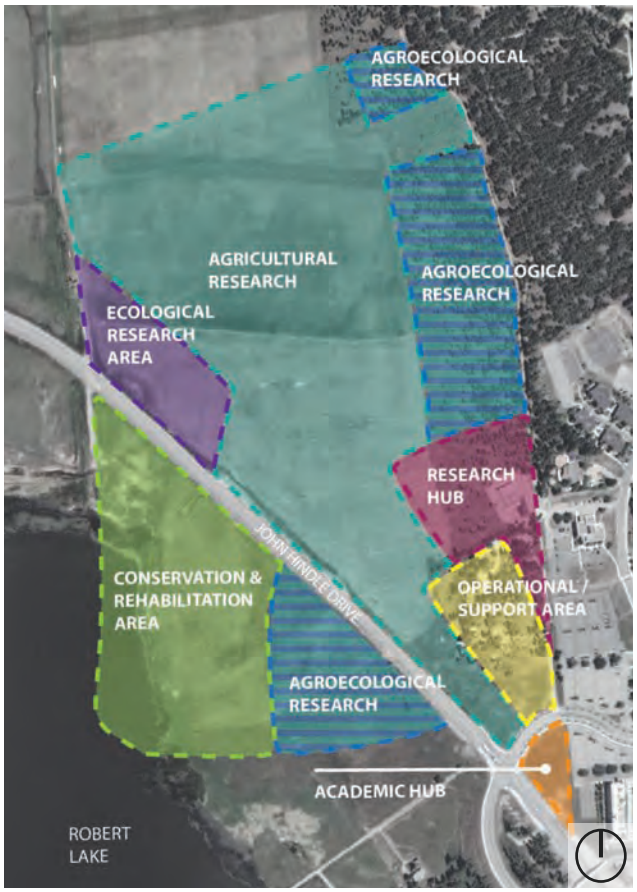
Key feedback received during this process included:

**UBCO Working Group**

- UBC is currently in discussions with the City of Kelowna to confirm whether the existing covenant for the future roadway connection across the site could be discharged. The proposed connection could be maintained as an internal access road for the West Campus Lands.
- Consider potential for more conservation of the ESA 2 designated Coniferous Woodland, or research uses that are more sympathetic to the natural ecology.
- Review opportunities for ecological connections such as seasonal wildlife paths, drainage swales/channels, wetlands in general.
- Consider the placement of more publicly accessed facilities, such as a Community Farm, in closer proximity to the Main Campus to capitalize on available resources, such as parking.
- Consider how infrastructure development might influence the program placement. If the City and GEID owned lands at the east edge of the site could be procured by UBC, there may be opportunities to establish service connections from the Main Campus and locate programs that requires a higher level of servicing to take advantage of this.

**Stakeholder: Agricultural Land Commission (ALC)**

- The ALC expressed concerns about the potential City road across the West Campus Lands. It is very likely that the ALC would not be supportive of the development of any such future road extension.
- Under ALC regulations, research is permitted, but research structures would be limited to 100m2 per parcel. Anything larger, and/or more than one structure under 100 m2 would require an application to the ALC. However, if the research is based on farm uses, there could be a good argument in support of the application.




**FIGURES 7:** Preliminary Structure Plan Simplified Plan

- The ALC noted that there is no requirement to farm agricultural land within the ALR, however restoration activities could require an application. The ALC would distinguish between active and passive restoration. For example, Ducks Unlimited have previously proposed projects to restore agricultural lands within the ALR back to wetlands, and they were required to submit applications and secure approval from the ALC.
- Functions in the Operational/Support Area should be limited to operations that serve or support farm use (e.g., barns for farm equipment). Campus operations or a works yard for the Main Campus would not be permitted.
- The Educational/Institutional (EDINST) designation reflected in the City's 2040 OCP was previously endorsed by ALC which could be an advantage for any Non-Farm Use applications to the ALC for institutional uses in the Academic Hub area.

**Stakeholder: Indigenous Studies at UBCO**

In June 2022, staff and students associated with the Indigenous Studies Summer Intensives and Ecological Inventory toured the West Campus Lands. The intent was to identify areas of value to the Syilx and opportunities for the West Campus Lands to contribute to Indigenous Studies and the Bachelor of Nsyilsxcen Language Fluency (BNLF) program and research.

One significant finding was a high value zone identified along the GEID/City parcels, on the west side of G Lot, and in and around the slope where the southern most house is located on Lot C (refer to Figure 8 this page). This area contains a high number of Saskatoon bushes and berries, particularly along the south and east slopes of this area and along the west side of Parking Lot G. These Saskatoon bushes are one of the most rare of the seven identified Saskatoon varieties, and should be preserved and used for Indigenous studies and research.

A report is being developed by the Indigenous faculty and students involved in the summer intensives. It is anticipated the report will recommend the retention of this area for gathering and study, as well as the possible use of one of the existing houses for picking and drying. The final report should inform the next steps of the Conceptual Structure Plan design process.

Other key findings of the tour were associated with Robert Lake and its surrounding area and included:

- The observation of flora and fauna used by the Syilx people, potentially including spike rushes. The group identified a desire to perform audits, in different seasons, to document the diversity of species.
- The area was identified as an area of importance pre-settlement, used as both a food source and for medicine (associated with the alkalinity of the lake).
- The group noted that there needs to be more archaeological research and assessment to determine if there were more campsites or other structures beyond just summer camping.

**FIGURES 8:** West Campus Lands - Saskatoon Berry zone. Source: UBC

- The movement of wildlife species from Robert Lake across to the Coniferous Woodland needs consideration. Drainage culverts and fencing pose challenges to this movement. A wildlife underpass could be considered for amphibians and small mammals.
- Invasive species were noted in the area. It was noted that the removal of these species and revegetation planning could be performed as part of the Indigenous studies program.

# APPENDIX D
# URBAN SYSTEMS MEMORANDUM

URBAN SYSTEMS

# MEMORANDUM

DATE: October 25, 2022
TO: Dana Graf, Interior Designer, Associate – Kasian Architecture Interior Design and Planning Ltd.
FROM: Thomas Simkins, P.Eng
FILE: 2867.0012.01
SUBJECT: UBCO West Campus Lands

Please see the attached servicing concept sketch and associated magnitude of costs for the University of British Columbia – West Campus Lands. The following describes the general servicing concept and further outlines our assumptions based on unknowns at this stage.

## 1.0 ROADS

The West Campus Lands are to be accessed from existing points along John Hindle Drive and Upper Campus Way. A limited emergency access will be provided along the existing GEID right-of-way off of Upper Campus Way.

The three road cross sections outlined below provide transportation movement through the West Campus Lands. It is our understanding the roads will be low volume and mainly used for agricultural and research purposes and therefore don't meet the standard UBC cross section. It is assumed no access road is required to service the Academic Hub.

### 1.1 SINGLE LANE (4.0M) AGRICULTURAL GRAVEL ROAD

These single lane gravel agricultural roads form the internal roads northwest of the Research and Operational/Support Area. The 4.0m single lane is wide enough to accommodate larger agricultural vehicles with some "pull out" areas for vehicles to pull over if required.

- Includes 0.5m shoulder on both sides
- Standard 'V' ditching both sides 300mm below subgrade

### 1.2 TWO LANE (3.0M) AGRICULTURAL GRAVEL ROAD

The two lane gravel agricultural road is to connect Upper Campus to the Research and Operational/Support Area. The 3.0m lanes with shoulders should be adequate to provide enough width for larger agricultural vehicles and enough width for some form of pedestrian movement. Street lighting is anticipated along this section to also accommodate pedestrian movement.

- Includes 1.0m shoulder both sides
- Includes street lighting

### 1.3 URBAN LOCAL ROAD

The urban local road is to connects the West Campus Lands to Upper Campus through Lot G. It is anticipated this exiting parking lane will be improved to include pedestrian facilities such as sidewalk, curb and gutter, and street lighting.

- Includes 2 – 3.35m lanes with curb/gutter both sides

- Includes sidewalk on a single side
- Includes street lighting

All costing for roads assumes:

- All alignments follow existing topography
- Cross section daylights at edge of ditching/extents of cross section
- Common excavation to subgrade
- Geotech not available at this time - all road structure is assumed to be 100mm asphalt (where required), 100mm base or surface material, 300mm subbase
- Subgrade is adequate and there is no over excavation required

## 2.0 WATER

It is our understanding that water to the West Campus Lands is to service the Research and Operational/Support Area as well as irrigation for future agricultural use. The main tie-in point is to the existing GEID line which runs north south from the reservoir along the right of way. A potential cost savings to provide water to the Research and Operational/Support Area would be to connect to the existing water system near the Plant Growth Research building and should be explored in future design.

A second tie-in for irrigation south of John Hindle Drive is assumed to come off the GEID main running along John Hindle Drive.

The water main servicing the existing Health Building is to be extended to service the future Academic Hub.

- Includes water main scope at both the research & operational/support area as well as the academic hub
- Assumes 250mm diameter PVC water main with hydrants and valves every 100m
- Assumes imported trench backfill material
- Assumes one tie-in to existing mater main in GEID easement and one on John Hindle Drive
- Includes 3 – 150mm services
- Includes 2 irrigation points of connection for future agricultural irrigation systems
- Does not include offsite improvements to the existing system

## 3.0 SANITARY SEWER

The topography of the West Campus Lands dictated that the sanitary sewer be provided via a low pressure system with individual pumps at the future buildings. The low pressure system will service the Research and Operational/Support Area and tie-into the existing gravity system near the intersection of Discovery Ave and University Way.

The gravity sanitary servicing the existing Health Building is to be extended to service the future Academic Hub.

- Includes sanitary main scope at both the research & operational/support area as well as the academic hub
- Includes 50mm diameter low pressure sanitary system tie-in to existing gravity sanitary system at Discovery Ave
- Does not include on site pumps required to connect to the low-pressure system. These systems are generally $7,000-$10,000 depending on anticipated flows and requirements.
- Includes 2 – 50mm diameter services
- Includes 1 – 10mm diameter service
- Assumes 200mm diameter PVC sanitary main extension from Health Building including manholes every 100m
- Assumes imported trench backfill material
- Does not include offsite improvements to the existing system

## 4.0 STORM

The storm water from the West Campus Lands ultimately drains into Roberts Lake. It is our understanding that there are ongoing and future studies around managing the flows into Roberts Lake as to not impact its unique alkali habitat and capacity. It is anticipated the development impacts of the proposed servicing and land use will be minimal.

All future development in the West Campus Lands will need to meet the City of Kelowna SDS Bylaw No. 7900 Section 3 for storm water management. We anticipate the city will require that the storm water system be designed to ensure there is no impact to downstream infrastructure including Roberts Lake.

Generally, the City of Kelowna would require a development to attenuate the 100-year post development flows to the 5-year predevelopment flows. However, this approach would not mitigate the increase in total runoff volume that would ultimately be conveyed to Roberts Lake. The City of Kelowna could consider any increase in total runoff volume as a negative impact environmentally and reduced capacity due to the absence of an outlet at Roberts Lake.

To manage both the increase in runoff flow and volume due to development of the West Lands the following approach should be considered:

- UBCO's Integrated Rainwater Management Plan should be implemented to manage and retain onsite storm water up to 50mm for all additional impervious areas. It is our understanding this would be a building project requirement and cost.
- The increased runoff, beyond the 50mm captured onsite as part of the Integrated Rainwater Management Plan, shall be retained by a storm water facility onsite (within the West Campus Lands) and disposed through infiltration or evaporation. The storm water facility shall be sized to accommodate up to the 100-year event with an emergency overflow to John Hindle Drive.
- The Academic Hub should also implement UBCO's Integrated Rainwater Management Plan to manage and retain onsite stormwater up 25mm for all additional impervious areas. All runoff beyond 25mm shall be retained onsite via infiltration tank or alternative solution and accommodate up to the 100-year event.

Due to limited information at this stage (i.e. development characteristics, soil permeability, etc.) the following assumptions where made to size potential storm water tank for the Academic Hub:

- 75% of the site is develop (increased impermeable area)
- Soils have reasonable permeability and are suitable for infiltration (1.00E-05)
- 100m$^3$ (10x10x1m) tank

- Proposed roads will manage existing storm water via ditching and low impact drainage and/or attenuation and are considered costs within the road's unit pricing.
- Future considerations should be given for increasing attenuation and storm water quality prior to the culverts crossing John Hindle Drive health of Roberts Lake.

Initial sizing of the storm water facility within the Research and Operational/Support Area to retain the 100-year runoff is approximately 90 cubic meters. The sizing is based on the following assumptions:

- Modified rational method and IDF curves from the City of Kelowna SDS Bylaw
- 15% increase for climate changed as suggested by the City of Kelowna SDS Bylaw
- 2000 square meters of additional impervious areas for 3 future buildings as provided by UBCO
- 100-year, 24-hour storm event
- An above ground retention pond has been priced as part of the cost estimate. It is anticipated this will be located between the Combined Research and Operational and John Hindle Drive based on topography and soil permeability.

We believe the approach described above is conservative, meets the intent of the City's SDS Bylaw, while also implementing UBCO's Integrated Storm Water Management Plan. We recommend a storm water management plan, including modeling, be completed prior to development to confirm design criteria and review additional scenarios (i.e. back-to-back events, infiltration rates, development criteria and characteristics).

## 5.0 ELECTRICAL

It is assumed electrical servicing would be provided by Fortis BC via a connection to the Upper Campus to the Research and Operational/Support Area while the Academic Hub would be serviced by extending the existing electrical from the Health Building.

There may be potential cost savings to tie-in into the existing overhead which runs along the southwest edge of the West Campus Lands adjacent to Upper Campus Way. This should be considered in future studies and design.

- Includes 4 runs of conduit in common trench
- Includes copper and vaults (max 60mm spacing)
- Includes 2 tie-ins to existing utility
- Does not include transformers, kiosks, or meters
- Does not include offsite improvements to the existing system

URBAN SYSTEMS MEMORANDUM

DATE: October 25, 2022 FILE: 2867.0012.01 PAGE: 5 of 6
SUBJECT: UBCO West Campus Lands

## 6.0 COMMUNICATIONS/IT

It is our understanding that future buildings in the West Campus Lands will need to be serviced with communication infrastructure. It is anticipated that the communications/IT will be connected to the existing infrastructure at Discovery Ave. As the ultimate number of buildings is unknown at this time, UBCO has provided an assumed total of 4 buildings for purposes of quantifying the total number of quantities.

The Academic Hub will be serviced by extending the existing communications/IT infrastructure from the Health Building.

- Includes 2 runs of conduit in common trench for each future building
- Includes fibre and vaults (max 60m spacing)
- Includes 2 tie-ins to existing utility
- Does not include offsite improvements to the existing system

## 7.0 GAS

The West Campus Lands will be serviced with gas from Fortis BC. It is anticipated that the Research and Operational/Support Area will be connected to existing Fortis BC infrastructure at Discovery Ave and the Academic Hub will be serviced via extending the existing infrastructure from the Health Building.

- Includes 2 tie-ins to existing utility
- Does not include building service or meter
- Does not include offsite improvements to the existing system

## 8.0 DISTRICT ENERGY SYSTEM

It was confirmed by UBCO that the Research and Operational/Support Area does not require connection to the District Energy Systems. However, the Academic Hub will be connected to the existing District Energy System from the Health Building.

- Includes single tie-in at Health Building
- Includes 400mm diameter supply & return pipe
- Includes cost for valves every 100m
- Assumes imported trench backfill material
- Assumes restoration of the existing road/parking areas

## 9.0 GENERAL ASSUMPTIONS

- Assumes existing infrastructure has adequate capacity to service the West Campus Lands and no offsite improvements are required (internal UBCO or third-party infrastructure such as City of Kelowna, GEID, FortisBC).

**URBAN SYSTEMS MEMORANDUM**

DATE: October 25, 2022 FILE: 2867.0012.01 PAGE: 6 of 6
SUBJECT: UBCO West Campus Lands

- Costs do not include onsite servicing requirements such as connections to the future buildings, parking areas, transformers, meters etc.
- Includes 6.5% costs for general requirements including temporary construction facilities, construction survey and layout, traffic management etc.
- Includes 2% costs for miscellaneous removals
- Includes 40% contingency and 15% engineering consistent with a Class D estimate as classified by EGBC.

## 10.0 NEXT STEPS

The concept sketch and magnitude costing are provided at a very high level. It is recommended a further detailed servicing study is completed which includes:

- Future servicing demand calculations of the West Campus Lands and Academic Hub
- Capacity analysis of the existing systems
- Geotechnical study
- Topographic Survey
- Preliminary design with alignments/profiles etc.

Please don't hesitate to contact the undersigned for any follow up questions.

Sincerely,

URBAN SYSTEMS LTD.

Thomas Simkins, P.Eng
Municipal Engineer / Principal

/ts
Enclosure

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URBAN SYSTEMS

## UBCO - West Campus Lands Servicing

| ITEM | DESCRIPTION | UNIT | Unit Price | Quantity | Extension |
|---|---|---|---|---|---|
| **DIVISION 01** | **- GENERAL REQUIREMENTS** | | | | |
| 1.1 | Temp facilities, construction survey and layout, traffic management | L.S. | $ 133,826 | 1 | $ 133,826 |
| **DIVISION 02** | **- EXISTING CONDITIONS** | | | | |
| 2.1 | Miscellaneous removals | L.S. | $ 40,370 | 1 | $ 40,370 |
| **DIVISION 03** | **- ROADS AND PARKING** | | | | |
| 3.1 | Single Lane (4.0m) Agricultural Gravel Road with Shoulder Both Sides (0.5m) | m | $ 296 | 1265 | $ 374,440 |
| 3.2 | Two Lane (3.0m) Agricultural Gravel Road with Shoulder Both Sides (1.0m) w/ Street Lighting | m | $ 728 | 405 | $ 294,840 |
| 3.3 | Urban Local | m | $ 2,639 | 125 | $ 329,813 |
| **DIVISION 04** | **- WATER** | | | | |
| 4.1 | 250mm PVC (includes hydrants, valves, and fittings) | m | $ 663 | 420 | $ 278,250 |
| 4.2 | 150mm Services | each | $ 3,000 | 2 | $ 6,000 |
| 4.3 | Tie-in | each | $ 5,000 | 1 | $ 5,000 |
| 4.4 | Irrigation Point of Connection | each | $ 25,000 | 2 | $ 50,000 |
| **DIVISION 05** | **- SANITARY** | | | | |
| 5.1 | 50mm Services | each | $ 3,000 | 2 | $ 6,000 |
| 5.2 | 50mm Low Pressure Sanitary Forcemain | m | $ 313 | 440 | $ 137,500 |
| 5.3 | Tie-in | each | $ 5,000 | 1 | $ 5,000 |
| **DIVISION 06** | **- STORM** | | | | |
| 6.1 | Storm Water Pond - West Campus Lands ($90m^3$) | each | $ 72,000 | 1 | $ 72,000 |
| **DIVISION 07** | **- ELECTRICAL** | | | | |
| | Electrical | | | | |
| 7.1 | 4 - Conduit (includes conduit, boxes, and copper) | m | $ 283 | 435 | $ 123,250 |
| **DIVISION 08** | **- COMMS/IT** | | | | |
| | IT | | | | |
| 8.1 | 6 - Conduit (includes conduit, boxes, and fibre) | m | $ 573 | 435 | $ 249,400 |
| **DIVISION 09** | **- GAS** | | | | |
| 9.1 | Gas | m | $ 200 | 435 | $ 87,000 |
| | | | | **Subtotal** | $ 2,192,688 |
| | | | | **Contingency (Class D - 40%)** | $ 877,075 |
| | | | | **Engineering (15%)** | $ 328,903 |
| | | | | **Total** | $ 3,398,667 |

URBAN SYSTEMS

## UBCO - Academic Hub

| ITEM | DESCRIPTION | UNIT | Unit Price | Quantity | Extension |
|---|---|---|---|---|---|
| **DIVISION 01** | **- GENERAL REQUIREMENTS** | | | | |
| 1.1 | Temp facilities, construction survey and layout, traffic management | L.S. | $ 34,183 | 1 | $ 34,183 |
| **DIVISION 02** | **- EXISTING CONDITIONS** | | | | |
| 2.1 | Miscellaneous removals | L.S. | $ 10,518 | 1 | $ 10,518 |
| **DIVISION 03** | **- WATER** | | | | |
| 3.1 | 250mm PVC - Retrofit (includes hydrants, valves, and fittings) | m | $ 923 | 55 | $ 50,738 |
| 3.2 | 150mm Services | each | $ 3,000 | 1 | $ 3,000 |
| 3.3 | Tie-in | each | $ 5,000 | 1 | $ 5,000 |
| **DIVISION 04** | **- SANITARY** | | | | |
| 4.1 | 200mm PVC - Retrofit (includes manholes) | m | $ 733 | 55 | $ 40,288 |
| 4.2 | 100mm Services | each | $ 3,000 | 1 | $ 3,000 |
| 4.3 | Tie-in | each | $ 5,000 | 1 | $ 5,000 |
| **DIVISION 05** | **- STORM** | | | | |
| 5.1 | Onsite Stormwater Tank - Academic Hub (100m3) | each | $ 80,000 | 1 | $ 80,000 |
| **DIVISION 06** | **- ELECTRICAL** | | | | |
| | Electrical | | | | |
| 6.1 | 4 - Conduit (includes conduit, boxes, and copper) | m | $ 283 | 135 | $ 38,250 |
| **DIVISION 07** | **- COMMS/IT** | | | | |
| | IT | | | | |
| 7.1 | 2 - Conduit (includes conduit, boxes, and fibre) | m | $ 313 | 570 | $ 178,600 |
| **DIVISION 08** | **- GAS** | | | | |
| 8.1 | Gas | m | $ 200 | 135 | $ 27,000 |
| **DIVISION 09** | **- DISTRICT ENERGY SYSTEM** | | | | |
| 9.1 | 400mm Supply and Return - Retrofit (includes valves, fittings, and restoration) | m | $ 1,728 | 55 | $ 95,013 |
| | | | | **Subtotal** | $ 570,588 |
| | | | | **Contingency (Class D - 40%)** | $ 228,235 |
| | | | | **Engineering (15%)** | $ 85,588 |
| | | | | **Total** | $ 884,411 |