

THE UBC SOUTH CAMPUS FARM:
THE ELABORATION OF AN ALTERNATIVE

by

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ABSTRACT

This thesis examines the possibility of retaining, redesigning, and integrating existing farm and forestlands within the proposed South Campus community development at the University of British Columbia (UBC). The central tenant of my thesis is, given the importance of agriculture in the development of human culture and the UBC Point Grey Campus, and the vital role it will play in the 21st Century, agricultural lands and facilities should be conserved and given a place of importance within the UBC landscape. An explanation is provided on how such an integrative proposal for these lands, collectively known as the UBC South Campus Farm, would support the economic, ecological, and social interests and expectations of the University, and the Greater Vancouver Regional District (GVRD), while providing an exciting learning and living environment for students, faculty staff and community members. An alternative proposal for the South Campus Farm and the South Campus community is provided that supports the stated interests of the University and the GVRD. This is accomplished through a careful assessment of the cultural and biophysical features of the South Campus lands and the subsequent development and application of a regenerative design process applied within a fourfold framework based on the concepts of ecology, economy, integrity and beauty. The final design proposal is compared and evaluated against the current situation and the University development plans.

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For our daughter, Everest Mae.

"Human demands upon the planet are now of a volume and kind that, unless changed substantially, threaten the future well-being of all living species. Universities are entrusted with the major responsibility to help societies shape their present and future development policies and actions into the sustainable and equitable forms necessary for an environmentally secure and civilized world."
- The 1991 Halifax Declaration.

"Perhaps we cannot raise the winds. But each of us can put up the sail so that when the wind comes we can catch it." – E.F. Schumacher.

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1.0 INTRODUCTION

1.1. BACKGROUND

In 1997 the Greater Vancouver Regional District (GVRD) adopted the Official Community Plan for that Part of Electoral Area 'A', which includes the University of British Columbia's (UBC) Point Grey Campus (GVRD, 1997). The OCP established generalized land uses, policies, and other criteria for future campus developments. The plan placed particular emphasis on development policies and procedures specific to those areas of the campus currently underdeveloped or expected to be significantly redeveloped. The OCP document was consistent with the GVRD's growth strategy outlined in their Liveable Region Strategic Plan, and in keeping with its recommendations made a commitment to accommodate a target population of 18,000 on campus residents by the year 2021, a figure roughly double the existing on-campus population and a total population of 24,000 residents expected by the year 2030 (UBC, 2000a; GVRD, 1997).

The goals of the GVRD and UBC embodied in the OCP were:

- To protect and maintain the viability of natural landscapes encompassing UBC;
- To build complete communities that provide a balance of jobs, housing, and services;
- To support the development of a compact metropolitan region by encouraging growth within it and concentrating development in mixed use centres;
- To manage transportation in a manner that favours a reduction of automobile use;
- To promote the University's academic mission and desire to be an internationally significant research and education institution;
- To provide a service that contributes to the economic, social and cultural well-being of our province and country while being sensitive to the issues of our global society; and
- To utilize and divest the University's land resources in a manner that supports the academic mission carried out in a way that is environmentally sound and consistent with regional objectives (GVRD, 1997).

As a result of the OCP process, eight planning or future development areas were identified to receive closer attention through the next planning phase, the Comprehensive Community Plan (CCP).

UBC's South Campus area, the southern portion of the campus bounded to the north by 16th Ave., to the southwest by Southwest Marine Dr. and to the east by Pacific Spirit Regional Park, was one of the eight planning areas identified in the OCP (UBC, 2000a). The OCP established development directions for each of these eight areas (GVRD, 1997). For the South Campus area, the focus of this thesis, the OCP determined that it should be developed as an "urban village in the woods", which could accommodate a variety of housing types, a commercial village centre, a community centre, an elementary school, and any other elements necessary to support a "complete" residential community (UBC, 2000a). The South Campus would retain some of its existing research areas but approximately 75% of this 90⁺ ha area would be converted into residential housing and community services (OCP, 1997). Roughly 90% or 45 ha of the approximately 50 ha currently used by the University for bio-science purposes (Faculties of Agriculture, Forestry and Science, and

Animal Care) would be lost under this redevelopment plan, their facilities consolidated, relocated or most likely, terminated. The OCP did not anticipate the effect that this proposal would have on the Universities bio-science programs nor did it anticipate the controversy it would generate when this loss was further revealed during the next phase of campus planning, the University's Comprehensive Community Planning process.

In February 2000, as a consequence of a public meeting where students openly criticized the University and the GVRD for their apparent disregard for the loss of much of the existing bio-science facilities, the Faculty of Agricultural Sciences with support from the Faculties of Forestry and Sciences submitted a statement of interest to the CCP process. This document entitled "Reinventing the UBC Farm: Urban Agriculture and Forestry on the Point Grey Campus" expressed a certain disappointment with the current campus planning process and its apparent inability to give fair consideration to the retention and incorporation of the remaining on-campus bio-science or working landscapes, particularly in the Mid and South Campus areas (Quayle *et al.*, 2000). Within the document an extensive rationale of why some of these areas should be retained was provided, drawing heavily on the University's own policy documents for support. The authors of this document did not object the University's interest in providing more on-campus housing for more residents. They did however, object to the manner in which this housing development was being considered and challenged those involved with the planning process to consider an inclusive community process where alternative community design proposals that examine the possibility of incorporating working landscapes within the proposed developments, could be given fair and substantive consideration (Quayle *et al.*, 2000). The following statement from the Executive Summary of this document provides an understanding of the Faculty of Agricultural Science's interest and vision for this landscape.

*"With the impending development of the South and Mid Campus lands UBC has a unique opportunity to integrate existing farm and forest lands into an internationally significant centre for sustainable urban agriculture, forest and food systems. The proposed UBC Farm enterprise would promote research, education, and extension on the various social, environmental, economic and ecological dimensions of urban farming and forestry, and sustainable food systems. The main focus of the Farm would be to support the University's educational mandate and to provide an on-campus experiential learning environment for University students, staff, faculty and neighbouring residents. The UBC Farm would be situated on the Point Grey Campus and would include the MacMillan Precinct, Totem Field, the Botanical Garden and the UBC South Campus Farm. The proposed UBC Farm enterprise would benefit the university community as well as a diverse array of local, regional, provincial, national and international constituents." (Quayle *et al.*, 2000).*

While development pressures currently threaten much of the agricultural lands at UBC's Point Grey Campus, recent changes to the Faculty of Agricultural Sciences programs and curricula have provided a great opportunity to participate and inform the development of these areas in a manner that is consistent with the interests of the University and the GVRD. There is also the opportunity to develop and propose viable alternatives through the application of design and planning that could protect and integrate agriculture on the UBC campus in a manner that explicitly supports the commitment of the Faculty of Agricultural Science to sustainability in education, research, ecology and community.

Through this thesis I intend to develop a sound and compelling argument for the conservation and integration of agricultural land and practices on the University of British

Columbia's Point Grey Campus, specifically within the South Campus precinct. The central tenant of my thesis is, given the importance of agriculture in the development of human culture and the UBC Point Grey Campus, and the vital role it will play in the 21st Century, agricultural lands and facilities should be conserved and given a place of importance within the UBC landscape.

1.2. PERSONAL INVOLVEMENT

I became involved in this planning process just over a year prior to the tabling of the *Reinventing the Farm* document through the accidental discovery of the UBC South Campus Farm. Like most UBC students I was completely unaware that a farm existed on campus. Shortly after this discovery my wife and I successfully applied for one of the resident caretaker positions. We moved onto the Farm on June 1st, 1999 and began what we now refer to as the "agricultural period" of our lives. We found it, and still find it hard to believe that we could live on a farm within such a large urban centre.

I learned of the University's intention to develop the South Campus shortly before applying for the caretaker position. At the time I was completing my second year of a three-year masters degree in the UBC Landscape Architecture Program and was actively searching for a thesis topic. After learning about the Farm and its predicament I decided to focus my thesis on the development of an alternate plan. Much of my time over the past 2 years has been spent revealing the University's plans to a wider audience and encouraging the discussion and development of an alternative, one that could accommodate the Universities development interests while retaining, and better integrating the existing biosciences facilities or farmland. Thus began a path of advocacy and investigation into the possibility of retaining and integrating a working farm within a university community. This thesis reveals some of this involvement and the understanding that I have been able to come to and how the Farm could be redesigned so as to lend support to both the University and the planned South Campus Community.

1.3. DESIRED OUTCOMES

I believe that it is important to state the intended outcomes of this thesis project. I have divided these into two categories, those that involve the community and those that involve my personal interests. Such an explanation is useful because it outlines the deliverables associated with this project and openly acknowledges certain biases and motivations.

1.3.1. Community

At the completion of this thesis project I hope to have fulfilled the following community outcomes:

- Reveal the University's plans for the South Campus to the wider community;
- Enter into discussions with the University and various stakeholder groups on the nature of this plan;
- Provide a viable alternative proposal that supports the needs of the University while addressing the interests of the various stakeholder groups that
- Supports the development of a comprehensive, integrated, complete, and to the extent possible, self-supporting community on UBC's South Campus.

1.3.2. Personal

At the completion of this thesis process I hope to have fulfilled the following learning outcomes:

- Develop a more complete understanding of the design process particularly as it applies to community and ecologically based projects;
- Learn more about agro-ecological systems design;
- Develop a visual language for expressing agro-ecological system elements;
- Develop a framework or process for agro-ecological design that might be adapted to other community development projects; and
- Contribute to the needs of the University community.

1.4. SCOPE AND INTENT

Initially the scope of this thesis was restricted to that area known as the UBC South Campus Farm, with a discussion of how the Farm might connect and support adjacent academic and community interests. However, as the project progressed it became evident that in order to develop a viable alternative to the current development proposal, one that gave fair consideration to the inclusion of an operating farm system, it would be necessary to broaden the scope of the thesis to include the South Campus area in its entirety. This would allow for the necessary exploration of how the South Campus Farm might be integrated within the larger community. In the end I settled for a two-tiered approach, which allowed the Farm to be more broadly considered within its contextual community and still be subject to specific consideration through the development of its individual programs and community connections. This broadened scope, allowed me to develop a more grounded landscape design proposal for the South Campus, which includes the South Campus Farm. This proposal, I feel, fully integrates the Farm while meeting the needs and interests of the University. The more focused design process has allowed for the careful consideration and development of those programmatic elements located on or immediately adjacent to the designated South Campus Farm area.

The intent of this thesis project was to carefully consider the re-design of the South Campus bioscience land base and facilities (the Farm) so that they fully embody the research, community, and pedagogical philosophy and mandate of the University. This thesis demonstrates to those involved or interested with the development of the South Campus landscape that there is an alternative to the proposed development - an alternative that meets or exceeds the interests of the University while supporting the principles of sustainability and retaining what little of the remaining on-campus working lands in a manner that is educational, integrative, self-sustaining and exemplary.

Research, planning and design work associated with this thesis built on the work done by others in this area, particularly with the development and academic directions outlined in the Official Community Plan, and a number of the University's strategic planning documents. The input and perspective of current users, key Faculty members and interested members of the UBC and Vancouver community was sought and considered wherever possible.

It is my hope that this thesis project will be used to support the development of a truly sustainable, healthy and complete community on UBC's South Campus - a development that retains and integrates the UBC South Campus Farm. As a consequence the thesis is largely illustrative, in that it provides a vision of what might be possible on the South Campus.

The intent of this thesis project is to reveal the possibility and consequence of enlarging the scope of consideration for the development of UBC's South Campus. I can only hope that it

convinces others that there are other development options for this area, options that more directly support the creation of a healthy, sustainable on-campus community.

1.5. CENTRAL THESIS

The retention, redesign and integration of the UBC South Campus bio-science facilities is necessary for the development of a complete and sustainable community within UBC's South Campus precinct.

If the University is truly committed to the principles of sustainability as stated in its guiding policies, then it should consider the local production food and fibre, the recycling of nutrients, the collection and use of locally available energy, the capture and recycling of water, and the health and well being of the future residents in the development of this landscape. I believe that the inclusion of a working landscape like the that provided by the UBC South Campus bio-science lands (hereafter referred to as the UBC South Campus Farm or Farm) can best support these sustainability goals while at the same time contributing to the academic and leadership mandates of the University.

1.6. SUPPORTING STRATEGIC PLANNING DOCUMENTS

The supporting rationale for this thesis is quite simple; I believe that if properly developed, the UBC South Campus lands, which would include an integrated and complimentary farm system, effectively support and demonstrate the principles, goals and policies articulated with the GVRD and University's strategic planning documents. The most significant of these include the GVRD's *Liveable Region Strategy*, UBC's *TREK 2000, A Legacy and a Promise: Physical Planning at UBC*, the *Academic Plan*, and *Policy #5: Sustainable Development* all of which have informed the development of the previously introduced OCP and CCP documents.

A careful review of these documents suggests that the central thesis directly or indirectly supports the principles, goals and policies articulated in these strategic planning documents. This suggests that perceived differences between those that want to develop these lands and those that would like to see the retention and integration of the existing Farm are not that great. In fact these existing policies may help both parties realize an alternative development proposal that incorporates both interests and in doing so supports the greater interests of the GVRD and UBC.

To better understand how these strategic documents might support and even direct the articulation of my central thesis it may be useful to briefly reveal consider these potentially supportive documents.

1.6.1. Livable Region Strategic Plan

The Livable Region strategy was adopted by the GVRD in 1996 and was largely informed by a vision that was articulated in *Creating Our Future*:

"Greater Vancouver can become the first urban region in the world to combine in one place the things to which humanity aspires on a global basis: a place where human activities enhance rather than degrade the natural environment, where the quality of the built environment approaches that of the natural setting, where the diversity of origins and religions is a source of social strength rather than strife, where people

control the destiny of their community, and where the basics of food, clothing, shelter, security and useful activity are accessible to all." (GVRD, 1996b).

Developed over a period of four years through a process of extensive public and intergovernmental consultation, public participants rejected a business-as-usual approach to regional growth and favoured the development of a strategy that was in keeping with the values expressed in *Creating Our Future* (GVRD, 1996b). Over the course of the planning process four fundamental strategies were adopted. They include:

- Protect the Green Zone;
- Build Complete Communities;
- Achieve a Compact Metropolitan Region; and
- Increase Transportation Choice (GVRD, 1996b).

The central thesis directly supports the first three of these strategies. Support for the fourth strategic direction could be developed through the development and elaboration of the associated programmatic and design elements. There is no anticipated reason why all four of these strategic directions should not be accommodated in the final design proposal.

1.6.2. TREK 2000

The University published the TREK 2000 document in 1999 as a way of establishing a vision for the University as it prepared to enter the 21st Century (UBC, 1999a). The intent of this document is captured in the mission statement.

"The University of British Columbia, aspiring to be Canada's best university, will provide students with an outstanding and distinctive education, and conduct leading research to serve the people of British Columbia, Canada, and the world. The University of British Columbia will provide its students, faculty, and staff with the best possible resources and conditions for learning and research, and create a working environment dedicated to excellence, equity, and mutual respect. It will cooperate with government, business, and industry, as well as with other educational institutions and the general community, to create new knowledge, prepare its students for fulfilling careers, and improve the quality of life through leading-edge research. The graduates of UBC will have developed strong analytical, problem-solving and critical thinking abilities; they will have excellent research and communication skills; they will be knowledgeable, flexible, and innovative. They will recognize the importance of understanding societies other than their own. As responsible citizens, the graduates of UBC will value diversity, work with and for their communities, and be agents for positive change." (UBC, 1999a).

The University proposed to accomplish this through the development of goals and strategies derived from five key areas:

- People;
- Learning;
- Research;
- Community; and
- Internationalization (UBC, 1999a).

A careful review of their associated principles, goals and strategies suggests that the central thesis is coherent with the values and desires expressed in the TREK document. In particular, the central thesis supports the ideals of quality, and leadership, and the ideas of experiential and interactive, interdisciplinary, community connected, learner-centred environments.

1.6.3. UBC Planning Principles

In 1999 the University adopted eight broad planning principles that became the foundation for developing and evaluating proposed physical changes within the campus lands. Together, they are the fundamental guide for the University administration, the broader community and all those who make decisions about the physical form, character and image of the University (UBC, 1999b).

These eight principles are grouped into three broad categories.

UBC: A Complete Community

1. The University Lands: As One

The University Lands are one entity, greater than the sum of their parts. The smallest area is as important as the largest building and both are equally significant to the University's mission. The lands will not be divided between jurisdictions.

2. The Community: Vibrant and Ever-Changing

UBC is a major centre within the larger region and a significant contributor to its economy. Many different uses and landscapes will sustain this energetic, sociable, safe and diverse community. The ever-changing landscape will support the intellectual curiosity, social well-being and spiritual life of its students, residents, faculty, staff and visitors.

UBC: A Unique Place

3. The Experience: A Place To Remember

The University's history, culture and natural setting combine to give the campus meaning and a sense of permanence for students, faculty, staff, residents and visitors. Physical changes will celebrate these attributes and respect their worth.

UBC: A Regional and Global Leader

4. The Environment: Incredible Riches

Graced with an incomparable natural environment in a maritime setting, the University will be a responsible steward, respecting and valuing the land, air and water that sustain this environment.

5. The Endowment: A Legacy Retained

The 1,000 acres that make up the University Lands will be retained by the University in perpetuity and judiciously used to enhance UBC's financial viability. Physical planning and design must be carefully integrated with academic and economic planning. Above all, the land endowment will be the stage to support the University's mission, leading to positive, enriching experiences for all users and visitors and building a sense of identification with the University that will last throughout their lives.

6. The Perspective: A World Beyond

The University is an integral part of the Vancouver city-region and is highly valued by many people across the nation and around the world. As the University grows, the aesthetic, social, economic and ecological significance of each proposed physical change will be viewed from a broader perspective.

7. The Opportunity: Global Leadership In A Changing World

The process of physical change must be flexible and responsive to the changing needs and values of society. The University will experiment with new ideas, establish precedents and provide outstanding leadership in urban planning, architecture, and landscape and building design.

8. The Process: Open And Integrated

The process of physical change must invite the participation of all who have an interest in the outcome and be exemplary in every respect. UBC has the mandate and the strong desire to work in collaboration with all members of the University community and neighbouring communities (UBC, 1999b).

The central thesis directly supports each one of these principles. This amount of agreement between the thesis and these principles suggests that the University should support the retention and integration of the Farm. However, the extent of this support will ultimately be determined by manner in which the thesis is elaborated. Given the importance of the *Planning Principles* to the development of the University's lands it would be prudent to ensure that the Farm's programs "meet or beat" the expectations bound up in these 8 principles.

1.6.4. Academic Plan

The UBC Senate endorsed the *Academic Plan* early in 2000 (UBC, 2000b). Developed by a broadly based committee of 40 faculty, staff, students and alumni, and through hundreds of hours of discussion and consultation the Plan sets out ideas and actions designed to help shape the academic future of the University. The development of these ideas and actions was intended as a way of guiding faculty, staff, students, and alumni in building the university envisioned in *Trek 2000* (UBC, 2000b).

The *Academic Plan* consists of five broad, interrelated goals that highlight the overarching themes that are of priority.

1. Retention and Renewal of Faculty and Staff.
2. The Learning Environment.
3. Research Excellence.
4. Links With the Community.
5. Effective Governance (UBC, 2000b).

The central thesis as described directly supports Goals 2, 3, and 4. It is anticipated that the anticipated programs that would develop as a part of the Farm would directly support Goals 1, and 5. As with the other policy documents there are no apparent or expected contradictions with the central position of this thesis.

1.6.5. The University's Sustainable Development Policy (Policy #5)

Approved by Senate in 1997 the Sustainable Development Policy commits the University to the application of the principles of sustainability in the management and development of its landscape and associated programs (UBC, 1997).

"As part of its responsibility as an educational and research institution and as a signatory to both the Halifax Declaration and the Talloires Declaration by the University Presidents for a Sustainable Future, UBC provides leadership by demonstrating the means to a sustainable community on campus. UBC recognizes that just as the university contributes to a healthy society and economy through education to build up social capital, we also need to invest in maintaining the ecological services and resources, our natural capital, upon which society depends.

UBC seeks to become a centre for teaching and learning about the skills and actions needed to manage ourselves in a sustainable way. This in turn requires responsible fiscal management that enables the university to continue to pursue these goals."
(UBC, 1997).

Under this policy UBC, including its subsidiaries and ancillary operations, is committed to improving its sustainability performance in all areas of operations. As a consequence UBC is required to develop appropriate standards for managing sustainability at UBC. This includes the establishment of specific targets, priorities and timetables for achieving sustainability objectives that are developed in a consultative process that involves faculty, staff and students. In an effort to support the overarching mandate for academic and research excellence, efforts have been focused on the following inter-related areas:

- Protection of environmental life support systems.
- Preservation and enhancement of integral UBC ecosystems at UBC.
- Conservation of resources and reduce waste.
- Application of information and reporting systems that support the development of openly accountable models of decision making that support the principles of sustainability.
- Long-term economic viability through responsible and effective resource management.
- Enhancement in the capacity to teach, research and practice sustainable development principles, and to increase ecological/social/economic literacy and practices among faculty, staff, students, and the community (UBC, 1997).

UBC has underscored that the implementation of this policy requires the mindful balance of ecological, social and economic imperatives, in an open and transparent decision-making process with the involvement of all stakeholders (UBC, 1997).

While the central thesis directly supports the University's *Sustainable Development Policy* the extent to which it supports it will be determined in its elaboration and through the corresponding program development and design phase. Like the other policy documents the *Sustainable Development Policy* will be extremely useful in the development of this project as it requires and supports the development of sustainable programs and landscapes at the University.

1.6.6. Summary

There are a multitude of reasons why the University should support the retention, redesign and integration of the South Campus Farm. This is strongly supported by the manner in which UBC's and GVRD's interests, as articulated through a variety of strategic planning documents, would be met through the realization of this proposal. The extent to which people will agree to the retention of the Farm will be determined by the manner in which the subsequent integration is explained. There is a requirement to explicitly demonstrate that the retention and integration of the Farm fully supports the interests of the University and the GVRD. If this can be done, and done in a way that is irrefutable then there is a possibility that it might actually happen. Consequently, during the development of this thesis project it will be necessary to continually demonstrate how the associated programs and design support and extend the interests of the University and the GVRD.

1.7. THESIS OBJECTIVE

The objective of this thesis is simply to develop an alternative design proposal that supports the retention, redesign and integration the UBC South Campus Farm within UBC and the proposed South Campus Community.

Given this overarching objective and the necessity to adhere and support the interests of the University and GVRD the associated programmatic and design investigation will require the development of an integrated farm system that:

- Sustains itself indefinitely utilizing locally available materials, expertise, and support;
- Operates and is administered as a whole system that encourages the development of synergistic relationships;
- Provides theoretical and applied on-campus educational opportunities while supporting and extending the University's academic mandate;
- Respects the historical, ecological, and cultural foundations of the University;
- Meets or beats the University's expectations articulated in its *Planning Principles*, and *Sustainable Development Policy*; and
- Informs and supports the development of a unique, healthy and integrated community within the South Campus area that demonstrates the University's commitment to excellence and sustainability.

1.8. THESIS ORGANIZATION

The thesis is organized into five chapters. The first chapter introduces the nature, scope and rationale of and for the thesis investigation. The second chapter establishes and explains the subsequent design approach. The third chapter introduces the site and the subsequent analysis of its associated characteristics. The fourth chapter provides a description and explanation of the resulting programmatic elements. The fifth chapter brings the thesis to a close and reflects on the process and outcome, and provides recommendations on how this thesis proposal could be taken further. While some images, illustrations and designs are included within the body of the document, the presentation drawings resulting from the design investigation have been included within Appendix 1.

1.9. THESIS LIMITATIONS

This thesis has one very important limitation; it is my vision. While this thesis focuses on a real situation in order to develop and present a viable alternative, and while this project has received the endorsement from a number of faculty, staff, student, and community

members, it is important to recognize that it is my vision. Given the nature of this academic design process it was impossible to fully consider and involve the community and their interests, which will be necessary if a truly integrated farm system is to be developed within the South Campus area. To achieve this will require community support, which in turn will require real community participation and involvement.

2.0 PROCESS

The development of this design thesis was a convoluted process that occurred in fits and starts. Comparatively little time was spent in the development of the design – which, interestingly, was relatively straightforward. The most difficult aspect of the entire exercise was the development of a method to explain how and why I had developed the final design proposals. The development of this explanation took the better part of six months and in the process became what I believe is the most useful aspect of the thesis.

While an important outcome of this thesis is the development of an alternative plan for the South Campus Farm and community, I believe the process of design – how I arrived at the point where I could begin developing a future image of this area – might have true lasting value. And while I do hope that my designs for this area inspire the UBC community, ultimately the future development should result from an inclusive community design process that solicits and incorporates a wide range of dreams and visions from its members. The design of this community should not result from the vision of a select few i.e. those with the necessary training and technical ability - the planners, developers, designers and engineers. I am convinced that a design process that is informed by a collectively developed design framework, which incorporates a number of fundamental design principles, offers the best possibility of developing a consensus-based design solution.

What follows is a description of the design process that developed over the course of this thesis project.

2.1. DEFINING

The design process that developed over the course of this thesis can be divided into two parts:

1. The development of a series of regenerative or sustainable design principles, which informed
2. The development of a design framework.

This two-part design process was realized only after several unsuccessful attempts at generating a concise series of design principles complete with goals and possible strategies. These attempts failed because they were too complicated and confusing. They also failed to impart a certain depth of meaning. While they were very good at identifying potential sustainable nuts and bolts that could be used to inform the development of the design program, they were unable to impart any real depth of meaning or for lack of a better word, poetry. I needed to develop a process of design that could consider both the practical and the poetic in an uncomplicated fashion.

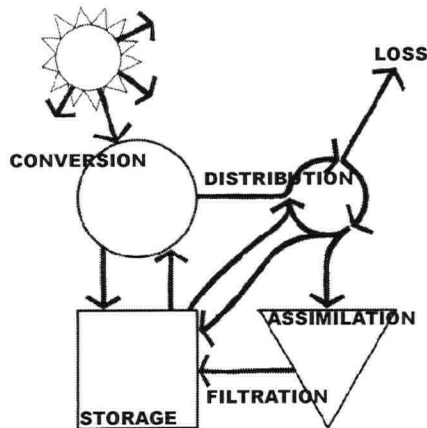
Fortunately, I was able to define this design process in two parts:

1. The identification of five primary regenerative design principles with their associated goals and potential physical design strategies; and
2. A four-part design framework that describes the overarching, design approach in which these regenerative design principles could be applied.

What follows is an explanation of these two aspects of the design process.

2.2. DEVELOPMENT OF REGENERATIVE DESIGN PRINCIPLES

The challenge for ecological designers is to move away from “linear” approaches that consider resources as infinite. This requires designers to think about resources differently and develop regenerative systems that reconnect/recycle outputs, and utilise renewable, non-polluting and longer lasting inputs (Lyle, 1994; Lyle, 1985).

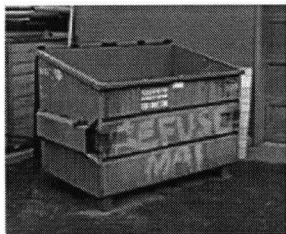


The late John T. Lyle developed the adjacent diagram method to describe regenerative systems. The diagram begins with the *conversion* of sunlight, the primary source of contemporary non-polluting energy, into various forms of matter and energy. *Distribution* of matter and energy is accomplished through mechanisms such as wind, rain, animals and people. *Assimilation* recognises that everything is recycled. Materials and energy that aren't *lost* through entropy are returned, largely to the soil, to be reutilized. *Storage* occurs where matter and energy is held inactive for periods of time awaiting eventual reuse (Lyle, 1994).

Lyle's diagram was used to explore the potential application of regenerative design methods on five

critical elements of the South Campus community, and generate a series of corresponding design principles, goals, and strategies.

2.2.1. Nutrients



The capture and cycling of local nutrients is an important characteristic of regenerative communities. Whenever possible nutrients should be captured, treated and reapplied within the community. There are numerous technologies available that make it possible to return vegetable, animal and even human waste back to the local landscape in a way that improves soil conditions and ultimately local productivity (Roelofs, 1996; Lyle, 1994; Mollison, 1988).

Principle *Develop healthy, productive soils.*

Goals

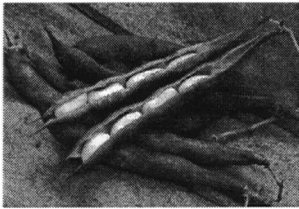
1. Minimize on-site nutrient loss;
2. Minimize the area covered by built infrastructure; and
3. Conserve and improve use of existing soil resources.

Physical Design Strategies

- i. Concentrated developments through the use of:
 - Narrow streets;
 - Limited paved parking;
 - Cluster developments;
 - Reduced building footprints; and
 - Multi-storey buildings.

- ii. Appropriate consideration of onsite resources to:
 - Maximize solar orientation;
 - Equalize cut and fill;
 - Reuse existing infrastructure;
 - Consider and utilise natural drainage features;
 - Appropriately place planned infrastructure developments; and
 - Incorporate existing vegetation.
- iii. On-site nutrient capture and cycling through the use of:
 - Solar aquatic technologies;
 - Composting toilets;
 - Grey water recycling systems;
 - Composting systems;
 - Biofilters;
 - Animals; and
 - Green manure crops.

2.2.2. Food and Fibre



The provision of homegrown food is decreasing throughout North America. This can be attributed to the availability of cheap, subsidised food. The average consumer generally does not know the manner of cultivation and distance that food purchased from a grocery store travels to get there. Regenerative communities consider the effects of the current food and fibre economy. Growing ones own food and fibre improves the health of the local and global

community. It also has the added benefit of improving local food security (Roelofs, 1996; Lyle, 1994).

Principle *Maintain, enhance and create healthy abundant landscapes.*

Goals

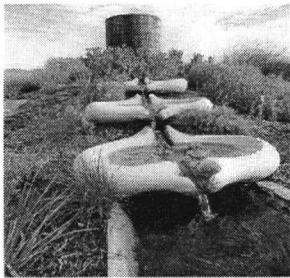
1. Provide the neighbouring community with locally grown organic food;
2. Reduce reliance on off-site food and fibre sources;
3. Manage existing forest areas for long-term conservation and production; and
4. Improve long-term site productivity.

Physical design strategies

- i. Incorporate diverse production systems and methods such as:
 - Agroforestry;
 - Permaculture;
 - Biodynamic farming;
 - Organic farming and gardening; and
 - Aquaculture.
- ii. Improve local food production through the development of:
 - A community farm;
 - Community gardens;
 - Backyard and rooftop gardens;
 - School and business gardens; and
 - Local market gardens.

- iii. Improve the localized cycling of nutrients through:
 - Community composting programs;
 - Solar aquatics facilities; and
 - Availability and application of locally produced animal manure.
- iv. Establish a community forest that could provide:
 - Food;
 - Wood (building material);
 - Firewood (energy);
 - Botanicals; and
 - Money.

2.2.3. Water



Water is an essential site element. Humans require approx. 4 – 8 litres per day yet; on average consume 600 litres per day (indoor and outdoor household use). Regenerative communities rely on on-site water sources the availability of which, dictates use patterns (Roelofs, 1996; Lyle, 1994). Here in Vancouver on-site water availability is seasonal, needs are generally met in the winter/spring months and challenged during the summer and fall. Conservation and retention strategies would have to be geared for the summer and fall (Hay & Oke, 1994).

Principle *Protect, conserve, enhance and cleanse water.*

Goals

1. Reduce water consumption;
2. Utilize on-site water sources;
3. Maximize water conservation, collection, storage, recycling and multiple use; and
4. Eliminate off-site discharge of untreated wastewater.

Physical design strategies

- i. Maximize on-site water retention through the use of:
 - Constructed wetlands and ponds;
 - Permeable swales; and
 - Cisterns.
- ii. Cleanse and reuse water through the use of:
 - Solar aquatic technologies;
 - Biofilters;
 - Greywater recycling systems; and
 - Water collection and reuse.
- iii. Maximize water conservation measures through the use of:
 - Xeriscaping techniques;
 - Composting toilets;
 - Use of efficient water fixtures and delivery systems;
 - Greywater recycling systems; and
 - Water harvesting technologies.
- iv. Incorporation of passive or energy efficient delivery systems such as:
 - Gravity delivered irrigation systems; and

- Alternatively powered (solar, wind, pressure) delivery systems.

2.2.4. Energy



Considered to be the primary change agent of ecological systems, energy is generally taken for granted by today's society. However, as the price of non-renewable fuels increases coupled with an expected decrease in their availability it will become necessary to identify and develop alternative sources. Regenerative communities require sources of renewable energy that do not pollute, are available locally, and are affordable and efficient. Renewable energy sources of this nature are generally limited to solar, wind and hydroelectric energy but may include geothermal and biogas sources (Roelofs, 1996; Lyle, 1994).

Principle *Conserve and use energy efficiently.*

Goals

1. Reduce energy consumption;
2. Minimize or eliminate the use of non-renewable energy sources;
3. Utilise flexible and redundant energy systems; and
4. Develop locally appropriate, renewable energy systems.

Design strategies

- Maximize the use of conservation measures and alternative energy systems such as:*
 - *Passive day-lighting and solar heating strategies;*
 - *Use, selection and placement of shade trees and vegetative wind breaks;*
 - *Solar technologies;*
 - *On-site energy storage systems;*
 - *Fuel cell technology;*
 - *Geothermal systems;*
 - *Hydro systems;*
 - *Co-generation systems;*
 - *Biogas technology; and*
 - *Heat pump technology.*

2.2.5. Community



Regenerative communities are concerned with the beneficial integration of human settlements within nature (Lyle, 1994). This concern extends beyond the development of a healthy, substantive community life that emphasises local and long-term relationships. There is a genuine interest in the environment, which includes care for, connection to and situation in. Regenerative communities, while a far cry from the utopian ideal, suggest what a truly ecological lifestyle might be.

Principle **Cultivate complete, dynamic and regenerative communities.**

Goals

1. Foster and promote a sense of place;
2. Integrate work, residence, study, research and recreation within the community;
3. Foster pride in and commitment to the local community environment;
4. Create safe, healthy, participatory, empowering living environments;
5. Allow for adaptation/change; and
6. Maximize diversity.

Design Strategies

- i. Involve the community in:
 - Community planning/design processes; and
 - The development of community governance models.
- ii. Emphasize the local through a commitment to place-based design.
- iii. Employ adaptable design methods that:
 - Support incremental development patterns;
 - Retain and allow for changeable open space; and
 - Accommodate evolving building envelopes.
- iv. Design with children in mind.
- v. Emphasize community spaces.
- vi. Design for creative, integrated and interconnected community programs.

2.3. DESIGN FRAMEWORK

In an effort to take these regenerative design principles further I developed a design framework consisting of what I believe are four important concepts: ecology, economy, integrity and beauty. The development of each conceptual area was informed by inspiration, instruction and example. Inspirational quotes, definitions and precedents were used as a way of informing and explaining the concept development process. The final outcome of this process was an associated challenge for each conceptual area coupled with a series of possible approaches.

This framework allowed for a deeper exploration of the underlying and often subconscious design process. As a consequence, I was forced to be explicit about the critical elements of the design process. The design framework allowed for a deeper exploration and more explicit understanding of what was driving the design process. It also provided an alternative design approach that could both inform and incorporate community values during the expected development of a future community design process for the South Campus area.

What follows is an elaboration of each of the four concepts encompassed by the design framework.

2.3.1. Ecology

Inspiration:

"If we are to have an accurate picture of the world, even in its present diseased condition, we must interpose between the unused landscape and the misused landscape a landscape that humans have used well." (Berry, 1995).

"Knowledge of place - where you are and where you come from -is intertwined with knowledge of who you are. Landscape, in other words, shapes mindscape." (Orr, 1998).

Definition:

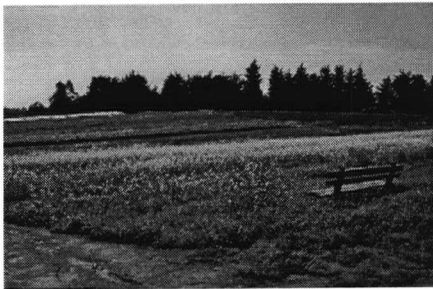
e•col+o•gy *n.* **1.** the study of the relationships between living organisms and their environment. **2.** the set of relationships of a particular organism with its environment. [from Greek *oikos* house + *-logy* indicating the science or study of, from *logos* the word.] (Hanks, 1979).

Ecology implies education - an education that involves the world and seeks to understand the relationships that exist between the living and non-living. A relatively new term, it has acquired another meaning, one that wrongly emphasizes the relationships, which occur outside humanity's influence. Coupled with this evolution in meaning has been a corresponding de-emphasis of its educational focus. Ecology is one of the pillars of my design framework because of its ability to capture the imperatives of understanding (learning) and of appreciating that which we inhabit - a participatory reverence that I think if fully recognised, is useful.

Precedent:

The possibility of developing on-farm programs, which integrate learning with participation and management, supports the expanding educational approach of many UBC faculties. I have selected three precedents that embody the principle of ecology as defined in by this design framework. The selected precedents exemplify participatory learning environments where the pursuit of ecological knowledge and appreciation is paramount. All three emphasize the practical; it is through participation that one learns and develops an appreciation for the natural world. The emphasis on participation particularly with the land, as in the UCSC and City Farm examples, enforces an appreciation for our role within the context of nature. As a consequence, this participatory approach reconnects and places its participants within nature while providing practical skills that support theoretical knowledge. Students learn and participate within a framework of application and this participation helps support these three facilities.

Center for Agroecology and Sustainable Food Systems



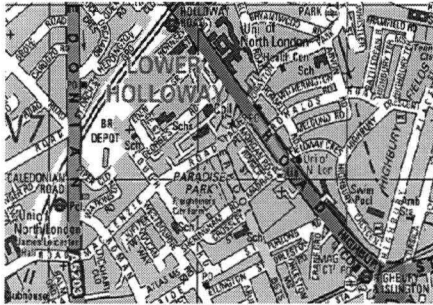
The Center for Agroecology and Sustainable Food Systems (CASFS) is a research and education group at the University of California, Santa Cruz. The Center's goal is to research, develop, and advance sustainable food and agricultural systems. The focus of the Center's research and education efforts is to increase understanding of the social, economic, political and ethical foundations of agricultural sustainability; to establish the ecological and agronomic basis for

sustainable production systems; and to demonstrate and facilitate the use of information critical to the adoption of these systems (CASFS, 2001).

At the heart of this internationally recognized program are two on-campus facilities: the 25-acre Farm and the four-acre Alan Chadwick Garden. Located at two different sites on the UC Santa Cruz campus, the Farm and Garden serve as facilities for the Apprenticeship

Program and other activities of CASFS, which include undergraduate and graduate classes, research, and public tours (CASFS, 2001).

City Farms



City Farms are environmental and agriculture projects located in urban centres that provide people with the opportunity to learn about the inter-relationship between urban and rural environments, humans and plants and animals, and the important influence of the seasons. At this time the City Farm movement is generally restricted to Europe and Australia (FCFCG, 2001).

The city farm movement began in the early 1970's, when initiatives sprang up in parts of Europe aimed at bringing derelict land back into use for the benefit of the local community, and which used farm animals as a central part of their activities. Initial projects started in the Netherlands, which used farm animals for educational purposes and later spread to England where government funding was used to set up the City Farm Advisory Service in 1976. Since then the City Farm movement has enjoyed steady growth with farms becoming established in numerous urban areas across the UK and Europe (FCFCG, 2001).

Schumacher College



Located in South Devon, England Schumacher College is an international centre for ecological studies that explores the foundations of a new paradigm through a program of individual residential courses taught by visionary teachers and more recently a one-year MSc. level program in Holistic Science. Those who teach at the College are selected for the significance of their work and their contribution to radical ecological thinking. The Dartington Hall Trust, a charity committed to innovative educational projects, established the College in 1991. The foundation of the College rests on the belief that the prevailing worldview, which has dominated Western civilization, has serious limitations and that a new vision is required to help human society, particularly with its relationship to the Earth (Schumacher College, 2001).

What is interesting about this precedent is the manner in which its daily affairs support what is being taught in the classroom. The meals are vegetarian and are prepared by the staff and students. Locally grown seasonal organic produce is predominantly used. All students and a number of the staff are housed on site. Everyone is expected to share in the communal tasks of cooking and cleaning (Schumacher College, 2001).

Challenge **Encourage and explore new ways of considering the environment and by doing demonstrate how society might become more active and supportive ecological participants.**

Approach

1. Provide holistic experiential learning opportunities that reveal and reconnect people with their environment.
2. Establish systems that embody and support the principles of sustainability and health.

3. Reveal the benefits of integrating agroecological systems within communities.
4. Establish extensive local, regional, national and international connections with ecologically orientated institutions.
5. Protect, reveal, enhance and integrate local natural systems within the farm and the surrounding UBC community.
6. Continually look to Nature as model and mentor.

Supporting Commentary

*"Ecological education - the way of the future - will require the reintegration of **experience** into education, because experience is an indispensable ingredient of good thinking. One way to do this, for example, is to use the campus as a laboratory for the study of its own food, energy, materials, water and waste flows. Research on the ecological impacts of a specific institution reduces the abstractions of complex issues to manageable dimensions, and does so on a scale that lends itself to finding solutions - an antidote to the despair felt by students who understand problems but are powerless to affect change."* (Orr, 1999).

2.3.2. Economy

Inspiration

*"The local community must understand itself finally as a community of interest - a common dependence on a common life and a common ground. And because a community is, by definition, **placed**, its success cannot be divided from the success of its place, its natural setting and surroundings: its soils, forests, grasslands, plants and animals, water, light, and air. The two economies, the natural and the human, support each other; each is the other's hope of a durable and a liveable life."* (Berry, 1987).

Definition

e•con•o•my *n.* 1. careful management of resources to avoid unnecessary expenditure or waste; thrift. 2. a means or instance of this; saving. 3. sparing, restrained, or efficient use, esp. to achieve the maximum effect for the minimum effort. 4. the orderly interplay between the parts of a system or structure: *the economy of nature*. 5. *Archaic.* the management of household affairs; domestic economy. [via Latin from Greek *oikonomia* domestic management, from *oikos* house + *-nomia*, from *nemein* to manage.] (Hanks, 1979).

Economy is a useful term to guide the development of this design project as it underscores the importance of careful management - management of resources in a manner that is both restrained and respectful. True economics requires careful measurement, analysis, response, and an informed involvement that if done well considers systems as wholes not parts and looks to the future, working with timeframes that extend beyond conventional 5 or 10-year terms. An economic approach necessitates discipline - a discipline concerned with the future health and viability of the community.

Precedent

I have selected three precedents that support an "extended" interpretation of economy. All three are managed in a way that generates the revenue necessary for their continued existence. But what is different is that by-and-large their management is restricted by a set of principles that place health, education and leadership above their need to generate revenue. Conventional economic interests take a backseat to their principles and their

beliefs. And it is this belief that permeates everything that they do. It creates and affects, in the words of Wendell Berry, their "household" economies.

These precedents in their own way have interpreted what it means to be an economist in the 21st Century. And their interpretations, though different are quite compelling. The Center for Urban Agriculture provides an outstanding example of how a working farm can prove otherwise and survive and thrive within a suburban neighbourhood. Landsake counters the "tragedy of the commons" and The John Lyle Center is a living classroom that is preparing a new class of economists for the challenges of the 21st Century.

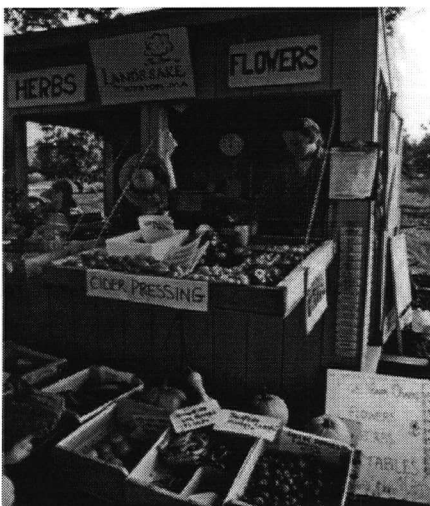
Center for Urban Agriculture



The Center for Urban Agriculture is a non-profit organisation, established in 1997 to preserve and operate the historic Fairview Gardens Farm in Goleta California. The farm's 5.7 ha produce over a hundred different fruits and vegetables distributed through a subscription farming program, on-farm produce stand, wholesale and speciality restaurant sales and attendance at local farmers markets. The farm feeds approximately 500 families, and directly employs over 20 people.

Additional funding is required to support the farm's cultural programs, which include festivals, workshops, tours, lectures, cooking and gardening classes, on-farm apprenticeships, and nation-wide school and community outreach and consultation. The Center's mission is to demonstrate the economic viability of sustainable agricultural methods for small farm operations; research and interpret the connections between food, land and community well being; and nurture the human spirit through on and off farm educational programs and public outreach (Ableman, 1998).

Fairview Gardens is an example of the potential that small integral urban farms and gardens hold for urban communities. With community support the Center convinced the farm's owners and city officials that the highest and best use for the farm was not housing but to grow food. The Center accomplished this through the development of on-farm programs that revealed how agriculture can nourish the spirit as well as the body, and how the farm had become an important place of interest and beauty in an increasingly banal and ecologically barren community.



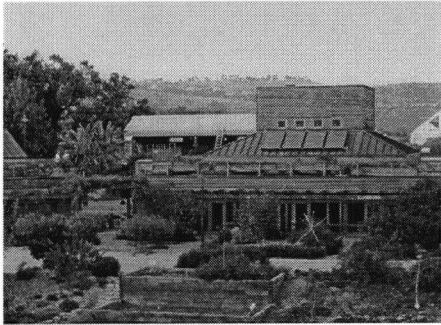
Land's Sake Community Farm

Land's Sake is a non-profit organisation in Weston, Massachusetts that is responsible for managing most of the town's 910 ha of conservation land. Besides growing organic fruits, flowers and vegetables, Land's Sake harvests firewood and timber from the town's extensive community forest, collects and makes syrup and cider from the town's sugar maple and apple trees and runs a variety of environmental education programs. The organisation employs a full-time staff of three, along with dozens of young people of various ages and education, and a few volunteers (Donahue, 1999).

Land's Sake was established in 1980 to provide a secure institutional home dedicated to the caring of community

land while providing employment and educational opportunities for local young people. Land's Sake's non-profit status has allowed for direct contracting with the Weston Conservation Commission to care for community land, free of the limitations imposed on municipal agencies. Their non-profit status has also allowed them to work and care for private land – a flexible arrangement that helps to establish connections between public and private lands (Donahue, 1999).

John T. Lyle Center for Regenerative Studies



The John T. Lyle Center for Regenerative Studies (The Lyle Center) is an interdisciplinary university-based setting for education, demonstration and research in regenerative and sustainable systems at Cal Poly University in Pomona, California. Students from any discipline at the Cal Poly campus can participate in courses. Currently, a community of 20 students resides on the site working with regenerative systems as part of their daily lives. The Center was originally designed to accommodate a total of 100 student residents (CRS, 2001).

The comprehensive design of the 7.3 ha facility provides a living environment for faculty, students and visitors to study passive solar designed buildings, renewable energy capture, water recycling, nutrient cycling, food growing systems, aquaculture, native habitat and human communities (CRS, 2001; Lyle, 1994).

The Lyle Center is dedicated to the education, demonstration and research of sustainable systems and technologies. These three objectives are interdependent and all contribute to the projects underway at the Center. These projects include alternative energy production, integrated waste management, natural area preservation, human and social systems, built form, aquaculture, and sustainable food production (CRS, 2001; Lyle, 1994).

Challenge **To conduct our affairs with humility in a manner that supports the true definition of economy - the careful management of resources in a way that maximizes health and benefits for all.**

Approach

1. Develop and use local, non-polluting, renewable energy sources.
2. Build-in accountability. Use full lifecycle or ecological accounting methods to guide decision-making.
3. Close nutrient and energy loops, enhance feedback mechanisms and support and encourage system redundancies.
4. Strive to support the health and longevity of all system elements.
5. Support local needs first.
6. Maximize synergistic connections and relationships.
7. Utilize consensus decision-making management methods.

Commentary

"What we have before us, if we want our communities to survive, is the building of an adversary economy, a system of local or community economies within and to protect against the would-be global economy. To do this, we must somehow learn to reverse the flow of the siphon that has for so long been drawing resources, money, talent

and people out of our countryside with very little if any return... We must figure out new ways to fund, at affordable rates, the development of healthy local economies. We must find ways to suggest economically - for finally no other suggestion will be effective - that the work, the talents and the interest of our young people are needed at home." (Berry, 1995).

2.3.3. Integrity

Inspiration

"A place is not a place until people have been born into it, have grown up in it, lived in it, known it, died in it - have both experienced and shaped it, as individuals, families, neighbourhoods, and communities, over more than one generation. Some are born in their place, some find it, some realise after long searching that the place they left is the one they have been searching for. But whatever their relation to it, it is made a place by slow accrual, like a coral reef." (Stegner, 1992).

Definition

in+teg+ri+ty *n.* 1. adherence to moral principles; **honesty**. 2. the quality of unimpaired; **soundness**. 3. **unity**; **wholeness**. [from Latin *integritas*.] (Hanks, 1979).

I generally associate integrity with those that transcend the human condition through their words and deeds. As a consequence, I think of individuals, single profound individuals who by the manner in which they conduct their lives improve the human condition. The lives of these individuals expose the possibilities of humanity and reconnect us to that which is true. I believe that we can get this same inspiration from the environment around us but often it is much more difficult for us to see. The discipline of ecology is helping to address this difficulty.

Gandhi taught, "Be the change you want to see in the world." To behave, to act out, to live that which you believe is true is integrity made manifest. I have included integrity within this framework because I think it is important to consider the connectivity of our designs - how they might re-connect us with the natural world, the spiritual realm, with other people and communities of people, and with ourselves. Integrity implies health so these connections must be an improvement on current conditions.

Precedent

The opportunity to develop farm programs at UBC that demonstrate integrity and leadership is an exciting possibility. Imagine on-campus farm programs that support the increasing commitment to sustainability and health - what currently is taught in the classroom, written about in articles or delivered in speeches can now be done locally, demonstrated and revealed. We can now practice what we preach.

I have selected three precedents that embody the definition of integrity. Each speak to the commitment that their respective communities have for "walking the talk"- the Adam J. Lewis Center for Ecological Studies to living education, Village homes to ecological community living, and Beech Hill Farm to integrated educational organic farming. Each precedent suggests possibilities for improving the manner in which we exist on this planet. The manner in which this is done is hopeful, exciting and exemplary. Each one is interesting, informative, and beautiful. They are tangible examples of what ecological living can be like.

The Adam J. Lewis Center for Environmental Studies



The Adam Joseph Lewis Environmental Studies Center at Oberlin College in Oberlin, Ohio, which opened early in 2000, is designed to serve as a living laboratory and model of sustainable architecture. It was designed to give all Oberlin students and faculty and the larger community the opportunity to work in and with a building that represents the most advanced knowledge and practice in sustainable design. Students and faculty were also involved in the planning and design of this building and many more will be involved in modifying and enhancing the technologies and design strategies they find there. The idea is to provide a facility that supports

the investigation and learning required for reducing the human footprint on the earth (Orr, 1998).

Although the Environmental Studies Center sits within a college campus, its exemplary qualities in the area of sustainable design and education will undoubtedly have a great influence on the international community. The Center is a tremendous example of the prestige, influence and energy that a new and innovative sustainable development can create. Through its very existence the Adam Joseph Lewis Environmental Studies Center challenges students and society to become active builders of sustainable community.

Village Homes



Village Homes is a 27 ha, 242-unit mixed -use residential development located on the outskirts of Davis, California. Initiated in the early 1970's by local graduate students in an effort to create a local sustainable residential development that embodied the ideals of the garden city. In spite of numerous roadblocks Michael and Judy Corbett, the eventual designers and developers of this project, were able to realise the creation of this project, which remains a leading international example of

sustainable residential development (Corbett and Corbett, 2000).

Village Homes includes a number of innovative features. The community is structured to maximize solar orientation allowing for the possibility of solar heating and energy production. Agriculture is integrated within the community with 7.5 ha set aside for cultivation. A variety of home types and sizes accommodate a variety of family incomes, sizes and types. Reduced street widths, the elimination of thru-streets and the inclusion of backyard travel corridors and common areas add to the feeling of community. A central drainage system that includes swales, creeks and ponds takes care of runoff. Community facilities include childcare, a swimming pool, restaurant and business centre (Corbett and Corbett, 2000; Corbett, 1980).

Beech Hill Farm



College of the Atlantic's Beech Hill Farm in Bar Harbour, Maine is located off-campus and includes approximately 2 ha of diversified, certified organic farmland, several acres of heirloom apple trees, 30 ha of managed forest land, a barn, farmhouse, farmstand, outbuildings, and greenhouses. The farm was donated to the College by alumni in May of 1999. It has become an integral and highly valued facility of the College. COA is currently in the process of using this facility to preserve working local

farmland and create a hands-on educational resource for students, farmers, and community members.

COA is committed to managing the Beech Hill Farm as a working, sustainable organic farm that provides fresh produce for the campus cafeteria and continues to serve local customers through wholesale accounts and a retail farmstand. The College's students, staff, faculty, and farm managers work collaboratively to meet the farm's threefold goal of demonstrating local and sustainable food production, and good land management and providing applied education opportunities.

Challenge To support the creation of an integral community that connects body and spirit to the land, the University, Vancouver and beyond.

Approach

1. Demonstrate respect and humility in the use of Creation.
2. Design with nature in a manner that supports or improves health and well-being.
3. Reveal and explore the benefits of integrating agroecological systems within communities.
4. Establish and maintain local, regional, national, and international connections with ecologically orientated institutions.
5. Look to nature as model and mentor.
6. Demonstrate and support beneficial leadership in the area of agroecology and integral systems design.

Supporting Commentary

"... we can, each of us, work to put our own inner house in order. The guidance needed for this work cannot be found in science or technology, the value of which utterly depends on the ends they serve; but it can still be found in the traditional wisdom of mankind." (Schumacher, 1973).

*"...I aspire
downward. Flyers embrace
the air, and I'm a man
who needs something to hug.
All my dawns cross the horizon
and rise from underfoot.
What I stand for
is what I stand on."
(Berry, 1980).*

2.3.4. Beauty

Inspiration

"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." (Leopold, 1968).

"We can say that man's management of the land must be primarily orientated towards three goals - health, beauty and permanence." (Schumacher, 1973).

Definition

beau+ty *n. p. +ties.* **1.** the combination of all the qualities of a person or thing that delight the senses and please the mind. **2. Informal.** an outstanding example of its kind. **3. Informal.** an advantageous feature. [from old French *biauté*, from *biau* beautiful.] (Hanks, 1979).

If this definition is extended and applied in the manner suggested by the preceding quotes, beauty is the consequence of getting a number of things right. If we are able to instil the principles of ecology, economy and integrity, as defined in this framework, then we have a good chance of supporting the development and presence of beauty. Beauty suggests the presence of something greater - an approach that is concerned with and considerate of the everyday - an approach that celebrates and respects the presence of the creative spirit. In short beauty is the pure expression of the engagement between the land and all that it supports.

Precedent

Beauty is an element that is often forgotten or negated by today's society. Beauty has become equated with superficiality - with surface. Like economy, a lot has been lost in this redefinition. I believe that beauty or true beauty suggests depth and is the sum expression of the nature and integrity of one's actions. It is the harmonious summation of applied ecological, economic and integral design principles. It is the Holy Grail. If we get these right it may be beautiful. I believe that all of the previous precedents support this. I have selected another three that express this element most clearly and uniquely.

Highgrove Estate is a living testament of an individual's commitment to principles. The strength of his character is revealed throughout his property. The Solar Living Centre is a business enterprise that challenges the economic norm by remaining true to the principles of its founders. It demonstrates ecological leadership that engages the mind, pleases the senses, and generates income. Pilchuck Glass School provides an outstanding example of the synergistic possibilities of applied creativity, aesthetics and landscape.

Highgrove Estate



and Charles, 1993).

Purchased in 1980 by HRM Charles, the Prince of Wales, Highgrove Estate has evolved into what many leading experts believe is the most important garden/farm estate to be developed in Britain in recent times. The Prince began actively farming the property in 1985 with the intention of developing it as a Home Farm (demonstration farm) for local farmers. In 1987 he began the process of converting the farm to organic practices. Within ten years the entire farm, which had grown to include 772 ha, was being cultivated organically (Charles

The Prince, guided by a sense of responsibility, has used Highgrove to successfully demonstrate that sustainable agriculture operations can benefit from an attention to aesthetics. He currently uses his appreciation for beauty to reveal and expand on the more utilitarian aspects of the farm. For example, the farm's sewage is treated using reed bed technology, a method that does not harm the environment and adds to the beauty of the landscape through the creation of a wetland environment. This is but one example of the care and attention that the Prince has given to his property. In doing so he is demonstrating the expanded possibilities that consideration and incorporation of aesthetics might bring to farm operations (Charles and Charles, 1993).

Real Goods Solar Living Center



The Real Goods Solar Living Center in Hopland, California is an example of a business that has successfully expressed its interest in sustainability through the design and management of its commercial buildings and landscape.

The Real Goods Company began over twenty years ago in California as a small chain of retail outlets selling solar panels and other green goods. Since that time it has evolved into a multimillion-dollar business that does most of its business via the mail and Internet selling everything from composting toilets to entire energy systems. In 1993 Real Goods embarked on an ambitious mission that would see it, in the words of its founder John Schaeffer, "walk its talk." The outcome was the development of a central facility that embodies and demonstrates Real Goods holistic approach to sustainability (Schaeffer, 1997).

The facility, located on a former industrial dumpsite, houses a showroom and distribution warehouse for the "real goods". It also includes extensive onsite demonstrations of sustainability such as the treatment of wastes, responsible re/use of water, the production of food, the creation of wildlife habitat, and the capture and use of local wind and sun energy. The facility and its surrounding landscape successfully embody and demonstrate the beliefs and principles of the company while acting as a working showroom (Schaeffer, 1997).

Pilchuck Glass School



The Pilchuck Glass School located on Victoria Hill in the Victoria community of Stanwood, Washington, approximately two hours south of Vancouver, was founded in 1971 by the internationally renowned glass artist Dale Chihuly. The school was established incrementally over the next three decades on 25 ha of the Pilchuck Tree Farm generously donated by Anne and John Hauberg. Since its auspicious beginning Pilchuck has broadened the scope of glass blowing and the

contemporary interest in glass as a visual arts medium, provided a catalytic environment for leading visual artists and served as a model of education in the visual arts (Oldknow, 1996).

What is unique to this precedent is the manner in which it evolved to become one of the leading seasonal visual arts schools and how its incremental evolution affected the design and construction of the campus. The structure is very organic and responds wonderfully to

both itself and the landscape. Beauty and creativity permeate every aspect of the school, from what is being taught inside the studio, to how glass is made, and the effect of its use. Pilchuck provides a strong example of how culturally informed practices can enhance the experiential life and meaning of a community.

Challenge **To fuse and transform the ecological, economic and integral framework in a way that catches the eye, inspires the mind, and touches the heart - ultimately to demonstrate hope in action.**

Approach

1. Create no ugliness here or anywhere.
2. Demonstrate and express the deeper meaning of quality, care, respect and attention.
3. Reveal the beauty of the everyday through the careful application of attention.
4. Investigate and promote the development of a sustainable aesthetic.
5. Reveal and respect the genus loci as broadly and as intimately as is possible.

Supporting Commentary

"I am convinced there's more to beauty than biology, more than cultural convention. It flows around and through us in such abundance, and in such myriad forms, as to exceed by a wide margin any mere evolutionary need. Which is not to say that beauty has nothing to do with survival: I think it has everything to do with survival. Beauty feeds us from the same source that created us. It reminds us of the shaping power that reaches through the flower stem and through our own hands. It restores our faith in the generosity of nature. By giving us a taste of the kinship between our own small minds and the great Mind of the Cosmos, beauty reassures us that we are exactly and wonderfully made for life on this glorious planet, in this magnificent universe. I find in that affinity a profound source of meaning and hope. A universe so prodigal of beauty may actually need us to notice and respond, may need our sharp eyes and brimming hearts and teeming minds, in order to close the circuit of Creation." (Sanders, 1998).

3.0 SITE ANALYSIS

3.1. APPROACH

The analysis of the site required a range of available information both biophysical and cultural. This information was collected and combined with personal observations and anecdotes gained from living on the site for two years. This information informed the subsequent design development process.

The design approach used to analyze and incorporate the site information was admittedly phenomenological in nature and comparatively similar to the approach described by Christophe Girot, which acknowledges and exposes intuitive responses during the design process. As stated by Girot,

"The primary purpose of this highly intuitive and experiential approach to working with sites is to draw as much as possible from the potential of any given place and to assess which existing landscape elements might be of real significance for the design yet to come" (1999).

The intent of this approach is to couple and assess the "insubstantial" or personally experienced qualities of the site together with the requisite collection of quantifiable site information.

3.2. SITE DESCRIPTION



UBC's South Campus precinct is triangular in shape, the southwest and northwest boundaries created by two major University access roads, Southwest Marine Drive and West 16th Avenue, respectively. The eastern leg of the triangle is formed by the western boundary of Pacific Spirit Park. The South Campus area is sparsely developed with much of its lands (> 85%) remaining in forest, field or nursery. The photogenic South Campus Road partially bisects the site effectively separating the agrarian field, nursery and research areas from the other research developments. The entire area is surrounded and visually protected by mature second growth forest.

3.3. SITE SELECTION

As discussed previously the selection of the site changed over the course of the development of the thesis. Originally the site was restricted to the areas located directly south of South Campus Road identified in the OCP as a future Housing Reserve and biosciences area. This site was selected for the following reasons:

- Both areas are contiguous and enclose a landscape of sufficient size to allow for a variety of programmatic elements including forestry, animal and horticultural agriculture;
- The site includes the expected bio-sciences facilities;
- This area will probably be the last area developed on campus given the expected progress of developments in the South Campus and the application of a 12 year development moratorium over much of the site; and

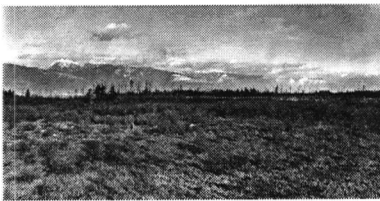
- It is the one area of the South Campus that has minimal built infrastructure, and the improvements that have been made to the area correspond with the programmatic requirements of a farm.

That was the initial plan. However, after having spent some time developing the program for this site it became clear that in order to develop a viable proposal that might interest the University I would need to demonstrate how the South Campus Farm would support the residential development planned for this area. It also became clear that in order to be taken seriously this project would have to attempt to accommodate the potential residential housing that was displaced from the Farm area.

As a consequence I opened up the study area to include a consideration of the farm within the context of the South Campus area. In this way I was able to more fully explore and demonstrate how the Farm would integrate and support the proposed community development. I was also able to explore ways of accommodating the anticipated population of 5000 people within a substantially reduced area – a direct consequence of retaining a sizeable farm area on the South Campus.

3.4. A BRIEF HISTORY

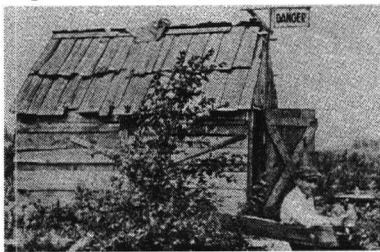
3.4.1. Past



The University of British Columbia is found within the traditional territory of the Musqueam First Nation. The Musqueam inhabited the Point Grey area for several thousands of years and until the time of contact, the forests of this area were their hunting grounds and the beaches their pastures (LARC 405 Studio, 1993).

In 1869, UBC was surveyed by the Crown for commercial logging and was then selectively logged by the Hastings Sawmill Company between 1870 and 1891. Labour intensive, selective harvest methods left many seed trees, which supported the rapid regeneration of the forest. In the early 1900's the Provincial Forest Service issued timber sales for the remaining salvageable redcedar trees to feed the rapidly growing cedar shake industry (LARC 405 Studio, 1994).

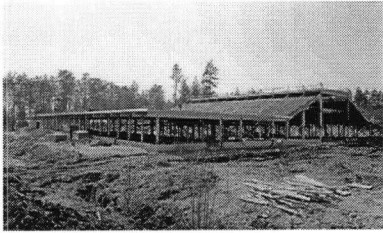
Agriculture played a very important role in the development of the campus. Around 1915



after the area was cleared the Faculty of Agriculture was involved in the clearing of debris to prepare the land for agricultural research and the future university (LARC 405 Studio, 1993). The University's first farm was established along what is now West Mall, directly west of the Chemistry building. Over the subsequent years the Faculty of Agriculture's interests shifted to the south end of main campus where they established their animal facilities.

Remnants of this time include the Barn Coffee Shop, the Landscape Architecture Studios and Horse Barn, all located on Main Mall.

As the University expanded to accommodate a growing student population agricultural activities were shifted from the main campus area towards Mid Campus. From the 50's until the early 80's agricultural research and teaching facilities occupied most of the mid campus



area. In the mid 70's development shifted agriculture from mid campus across 16th Ave. to the recently cleared South Campus area (LARC 405 Studio, 1993).

3.4.2. Present

Today agriculture at UBC is faced with the prospect of a third displacement. Due to spatial constraints and escalating land values, land based agricultural research and activities are not seen to be a practical and economically sustainable use of the remaining campus lands.



In 1997 UBC's Official Community Plan was passed. In an effort to reduce commuter traffic flows it called for a doubling of the campus's current residential population through the provision of more residential housing. In order to meet the housing recommendations of the OCP, the last remaining on-campus working landscapes - the vestiges of our agricultural heritage in the South and Mid Campus areas, were

identified for development (GVRD, 1997). Prompted by this development threat the Faculty of Agricultural Sciences has become a leading participant in the development of a public planning process. Students, faculty, staff and community members have come together to develop and promote a vision for agriculture at UBC that is informed by the principles of sustainability and considers and better integrates instruction, learning, research, and community (Quayle *et al.*, 2000).

3.4.3. Future



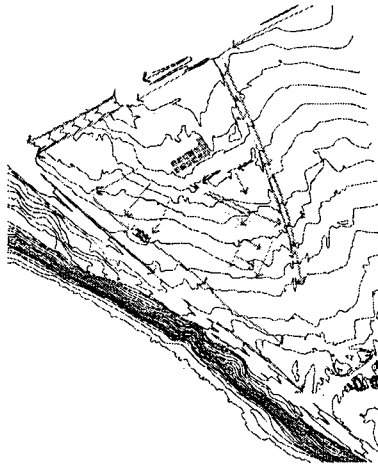
What does the future hold for land based agricultural practices at UBC? If student response to recent changes to the Faculty of Agricultural Sciences' curricula provides any indication, the future is full of hope. Students are genuinely excited by the possibility of retaining landbased, sustainably managed, integrated, participatory agro-ecological systems here on the UBC campus that demonstrate and challenge the Faculty, University and society. Over the last century agriculture has left a rich legacy to UBC. As we enter the 21st Century with all its associated ecological challenges, agriculture and in particular agricultural studies, provides a perspective that is rich with possibility. The UBC Farm is but one demonstration of this possibility.

3.5. INFRASTRUCTURE

3.5.1. Ecological

Topography and Drainage

UBC's South Campus is located on the Point Grey plateau, at an elevation of approximately 100 metres above sea level. This area has an average slope of 4% towards the south and southwest with a slope range of 2% to 6%. As a consequence there are no notable landforms on the site. Westbrook Mall lies along the main ridge in the area (LARC 405 Studio, 1993).

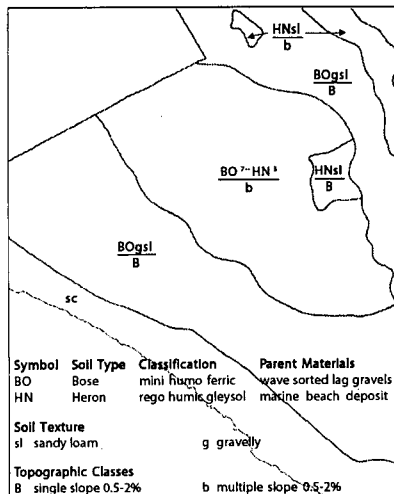


The orientation of the site allows for excellent afternoon solar gain. Potential views to the southwest of Georgia Strait are blocked by vegetation along South Campus Rd. and Southwest Marine Dr.

Permeable soils coupled with even, gradually sloping topography, mask the effects of surface drainage. In addition drainage patterns have been altered by development. Consequently, it is difficult to determine the exact drainage pattern of surface and subsurface water. Given the general south-south-west aspect it can be assumed that much of this water drains in the direction of this slope. In areas along South Campus Road, Westbrook Mall and the southern boundary of the 'South Field' drainage ditches have captured

these overland flows. The water collected by these improvements appears to be channelled to the southeast corner of the site where it passes under Southwest Marine Drive and down the cliffs to the ocean (Talisman, Land Resource Consultants, 1996; LARC 405 Studio, 1994).

Soils



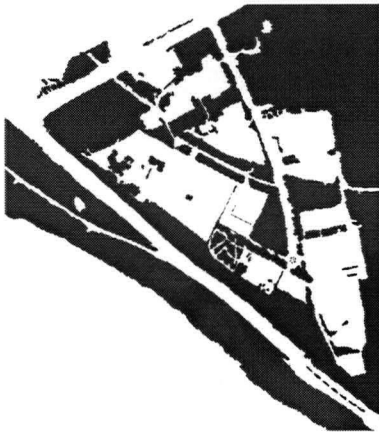
The soils of the South Campus lands consist of two orders: Podzolic and Gleysolic. The Podzolic Order is represented by the Bose Series, a Mini Humo-Ferric Podzol. The Gleysolic Order is represented by the Heron Series, a Rego Humic Gleysol (McBride, 1975).

Bose soils occur throughout the South Campus as a gravelly sandy loam material, often in association with Heron soils. The parent material consists of a mantle of wave washed lag gravels approximately 1-2 m thick overlaying Newton Glacio-Marine deposits. Bose soils are generally well to rapidly drained but can be affected by the presence of Newton deposits and Heron soils which restrict drainage and contribute to the creation of perched water

tables. The Bose soils have an Agriculture Capability Classification of 4, which is limited by factors such as stoniness and moisture availability during the growing season (McBride, 1975).

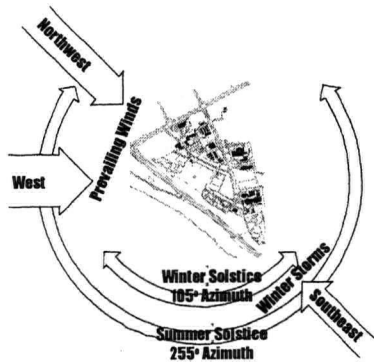
Heron soils occupy depressional areas in the western and mid areas of the South Campus, often in association with Bose soils. The parent material consists of Sunny Side Sands. Drainage is poor due to the depressional nature of the associated topography and the shallowness of a restrictive subsurface Newton Stoney Clay layer. Heron soils have an agriculture capability classification of 5 with limiting factors being stoniness and poor drainage (McBride, 1975).

Vegetation



Given the history of this site much, if not all, of the vegetation has been effected by past developments. Clearings that were developed in the 1970's today are either covered by built infrastructure and parking lots or by agricultural fields, animal housing and horticultural/forestry operations (greenhouses or fields). Between or surrounding these developments is a fringe of the remnant second growth forest. Red Alder, Douglas Fir, Bigleaf Maple and Western Redcedar dominate the vegetation of these forested areas. More recently disturbed areas exhibit greater numbers of Red Alder and Bigleaf Maple. In these areas the understory is quite dense with a mixture of young Douglas Fir and Western Redcedar trees. In those areas with a more mature forest the

understory is less dense with a mixture of salal, sword fern and Western Hemlock saplings (Dunster, 1999; Talisman, Land Resource Consultants, 1996).



Climate

UBC's South Campus has a Mediterranean type of climate that is characterized by warm, rainy winters and cool, dry summers. The Vancouver Island and Olympic Mountains protect the area from the direct onslaught of Pacific storms while the Coast Mountain Range shields the area from most major influxes of Arctic air during winter months (Hay & Oke, 1994).

The area receives an average annual rainfall of 1200 mm, the majority of which falls in the months between October and March. December tends to be the wettest month and August the driest. Soil moisture deficiencies occur between

June and September (Hay & Oke, 1994).

Mean daily temperatures peak in August around 17°C and reach a low of 2.5°C in January. On average the number of frost-free days exceeds 200. Hours of sunshine peak in July with 1461 hours on average received during the April to October growing season. 769 hours of accumulated heat units are received during the April to October months (Huglin Index of 1094) (Hay & Oke, 1994).

The mean annual wind speed for the area is 7.9 km/hr with the prevailing winds mainly originating in the West. Winter storms generally blow in from the southwest (Hay & Oke, 1994).

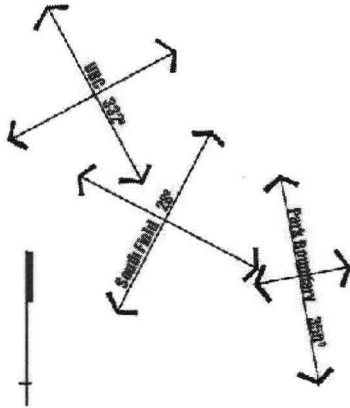
3.5.2. Built

Jurisdiction and Built Infrastructure

Please refer to the plan provided in Drawing 3, Appendix 1.

An extensive description of the built infrastructure found within the South Campus bioscience areas is provided in Appendix 2.

Orientation



UBC has responded to the cardinal grid in a number of different ways. To maximize the connection and views to Howe Sound the central University axis was shifted 332° from True North and positioned along the Main Mall ridgeline. This decision created a grid pattern of supporting streets that continue to influence the orientation of development in the Main and Mid Campus areas. This primary grid influence was broken in the South Campus area.

South Campus provides three different responses to the cardinal grid. The NRC building and Bio Science facilities continue the expression of UBC grid south of 16th Ave. The Fisheries, BC Research, Paprican and TRIUMF facilities are shifted 350° from True North in response to local topography and the western boundary of Pacific Spirit Park. This new grid allows for the best solar orientation on campus. The Forestry, Botany, Agriculture and nursery facilities in the South Field area south of South Campus Rd. are shifted only 28° from the cardinal grid in what appears to be a response to the local topography and dominant southwest views.

UBC Properties' proposal for the South Campus provides a somewhat unstructured or flexible response to each of these grid influences.

3.5.3. Future Plans



The University of British Columbia plans to develop the South Campus area over the next 30 years. This is being done largely to respect the recommendations of the 1997 Official Community Plan, which prescribes the development of more on-campus housing (UBC, 2000a). A combination of residential, research and community service developments is anticipated for this area with a final average Floor Space Ratio of 1.3 and with a final population of 5000 residents. At this time most of the development will be residential. 80% of the residential housing will be market; the remaining 20% will be rental, 50% of which will be subsidized. 40% of the housing will be ground-oriented and most buildings will be four stories or less. An elementary school and commercial centre are also planned for this area (UBC 2000a). Of these amenities the school is the one most demanded by the local community. The projected enrolment for the school is between 500 and 600 students (Young, 2000).

3.6. PRELIMINARY SITE ANALYSIS

3.6.1. Issues

The issues that surround the development of the South Campus Farm and landscape include the following:

- The University's plan to develop the Animal Science and Animal Care/Zoology facilities within the next 5-10 years as outlined articulated by the Comprehensive Community Plan and Support by the OCP.
- The South Campus lands are considered to be too valuable (economically) to remain in an "undeveloped" state.
- The prevalent underlying perception that agriculture is a "lower" type of land use when compared to residential or commercial developments.
- Due to a government-imposed tuition freeze the University is "strapped" for cash and is searching for ways of generating much needed endowment funds.
- Budget cuts have decreased the use and condition of the current South Campus bioscience facilities.
- Local security and safety issues have increased due to the isolated location and lack of use.
- Many existing facilities are old and require upgrades to improve efficiencies, reduce costs and waste, and improve their usefulness to researchers, staff and students.
- The ad hoc manner in which this area was developed has contributed to a legacy of unrelated and often incompatible site users and uses.
- The isolated location coupled with a lack of direct management has resulted in the deterioration and abuse of the South Campus land base facilities. Many of the areas serve a secondary function as storage/disposal sites for finished or abandoned projects, outdated equipment and excess materials.
- This lack of interest and attention has impacted the ecology and the aesthetics of the area.
- Most of the facilities and programs fail to support many of the principles and policies outlined in recent GVRD and UBC documents.

3.6.2. Opportunities

There are a number of readily identifiable opportunities:

- A large area (approximately 15 ha) of available, arable, cleared land for agricultural projects. It is currently under-utilized with excellent drainage and aspect.
- A relatively large area (15+ ha) of second growth forest that could support a forestry/agroforestry program.
- The secluded, enclosed and contiguous nature of the site further supports the development of a sustainable farm system.
- The site has numerous amenities including gas, hydro, water, and road access.
- The current use of the site is generally compatible with the proposed agricultural/forestry program.
- Most of the current occupants could be accommodated within the proposed sustainable farm system development.
- The location is world class. Internationally there are very few locations that exist that would allow for the creation of a sustainable farm system within such a large and complete university and with such a large population centre.

- South Campus Road is a natural break point between the proposed residential development and the proposed farm area.
- The proposed farm area is sandwiched between two identified greenway corridors the East Mall/Hydro Right-of-Way greenway and the S.W. Marine greenway. Both could be accommodated within the farm area and would serve to bring more people in contact with the farm.

3.6.3. Initial Design Response

Some of my initial responses to the site, the issues and the opportunities are listed as follows:

- The program for the "farm" should be inclusive. With its facilities threatened by development, reduced funding, age and inattention, the area clearly demonstrates that exclusivity or protectionism is ultimately problematic. If people do not know that the farm exists or they are prevented from connecting with it then how and why are they supposed to support its retention? The final program should be inclusive and should draw on the strengths of a number of different participants and the synergies that develop from their combination. Consequently, an ecologic or systems approach should be used to ensure efficiency, connectivity, synergy, feedback, and redundancy.
- Forestry, Zoology, Botany and Plant Operations should be included as important and equal partners with Agricultural Science in the development of a sustainable farm facility. Other possible participants include various NGOs, community members, and faculties and departments such as Architecture, Planning, Education, Medicine, Engineering and Fine Arts.
- In the interests of security, safety, and efficiency the Animal Care Centre should be relocated on-campus so that it can more directly serve the departments of Medicine and Zoology. It is highly likely that this self-contained facility will generally not require an arable land base.
- A collective middle or working landscape should be retained and integrated within the UBC campus in a manner that informs and responds to the needs and interests of the University and the surrounding community.
- Any proposed development should meet or exceed the interests of UBC and the GVRD as expressed in their recent planning and policy documents.
- All activities should respect the ecology and health of the environment and as such should be required to meet some reasonably strict organic regulations.
- It is expected that the initial switch to more organic/sustainable methods will be difficult. A process of gradually integration may ensure success. Dr. Stuart Hill, a social ecologist, has characterized such a process as a progression from shallow to deep sustainability.
- Limited residential housing should be incorporated on the farm site for security and logistical purposes. Those that occupy this housing should work or study on the farm.
- The farm should include a working forest in addition to aquaculture, agriculture and agroforestry operations. Animals and plants should be incorporated allowing for a direct investigation and expression of how agriculture and forestry operations might exist in an urban environment.

4.0 DESIGN EXPRESSION

4.1. PROGRAM DEVELOPMENT

The development of the program occurred quite early on in the thesis project. A number of possible programmatic elements were developed through a combination of ad hoc interviews, an identification of elements currently absent from the University environment, and a review of successful precedents. By far, the direct experience and review of a number of precedents through on-site visitations helped confirm the final selection of the programmatic elements that were included in the final landscape plan.

Eight main programmatic elements were identified for inclusion within the final landscape plan for the South Campus precinct. They include a:

- Village Area;
- Elementary or Farm school;
- Farm Centre;
- Community Forest Area;
- Central Farm Area;
- Market Garden Area
- Residential or Farm College; and a
- Nursery Area.

In practice these programmatic elements would be knit together or integrated in an ecological fashion. However, for the purposes of this thesis I have provided a separate description of each of these programmatic elements coupled with a brief explanation of how they support each other, and the Farm.

4.2. SUMMARY OF PROGRAMMATIC ELEMENTS

4.2.1. Village Area



The village area encompasses much of the northern portion of the site as shown in Drawing 10 (Appendix 1). This includes a mixed-use village centre, and surrounding medium and higher density neighbourhoods. Connectivity between the Village and the Farm is provided through the location of an elementary school, an OCP designated element that also forms the heart of the South Campus community.

This design for the South Campus village area differs significantly from that currently being proposed by the university in that there is a real emphasis on:

- Reducing the impact of development;
- Maximizing useful green space;
- Increasing diversity;
- Reducing waste;
- Using regenerative technologies;

- Improving the interconnectivity within the community and to the rest of the campus;
- Reducing impervious surfaces including road widths;
- Reducing the amount of through traffic;
- Improving energy efficiency through better solar orientation; and
- Retaining and fully integrating a diverse working Farm system.

Ultimately, there is increased consideration given to liveability, health, education and the environment.

Programmatic Elements

A number of important programmatic elements have been incorporated into the design of the South Campus village area (Drawing 10, Appendix 1).

Elements with quantifiable areas include:

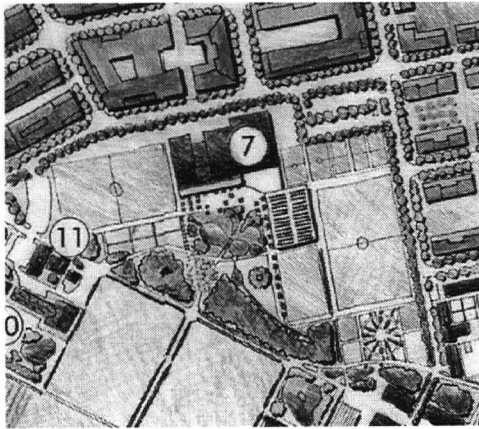
- | | |
|--|--|
| ▪ Medium density residential neighbourhood (13.4 ha) | ▪ Elementary school (3.5 ha) |
| ▪ Mixed-use village centre (5.4 ha) | ▪ Internal green space within residential neighbourhoods (6.5+ ha) |
| ▪ Shopping centre (1.3 ha) | ▪ Road right-of-ways (15 ha) |
| ▪ High density residential area (1.7 ha) | |
| ▪ Public "greens" – excludes community forest (2.4 ha) | |

Specific programmatic elements include:

- | | |
|--|---|
| ▪ Productive landscape plantings | ▪ Provision of backyard laneways that encourage alternative travel patterns |
| ▪ Incorporation of water catchment and storage facilities | ▪ Provision of backyard and community greens that could be managed in a aesthetic or productive fashion |
| ▪ Solar aquatic facilities to treat community wastes | ▪ Provision of a variety of housing types to serve a diverse population |
| ▪ Development organized to maximize solar orientation | ▪ Three towers are prescribed to meet the population requirement and to take full advantage of the potential ocean views to the southwest |
| ▪ Community orientated network of roads and paths | ▪ Elementary school is a central element |
| ▪ Residential roads have gravel verges to maximize the infiltration of water | |
| ▪ Reduction of roads and road widths | |

The location and development of the South Campus Village is critical to the development and integration of the Farm. The design provides a suggestion of how the Farm and the Village could be developed in an integrated fashion that supports one another's interests while providing a community space that would far exceed the expectations and interests of the University and GVRD.

4.2.2. Farm School



As discussed previously, the required elementary school (GVRD, 1997) would be located between the village and farm areas and would occupy a total area of 3.5 ha (Drawings 10 & 11, Appendix 1). The school building would be of a size necessary to accommodate an expected enrolment of 500+ students (Young, 2000). The location of the school, while not substantially different from that of the current University proposal, takes full advantage of the energetic potential associated with edge environments. By locating the school between the farm and the village there is an opportunity to reveal and explore the differences between rural and urban

environments. As a metaphor, the school can act as an educational bridge that connects these seemingly incompatible environments.

Given the school's location it could have a rural character, possibly incorporating an agriculture or forestry theme through the detailing of its exterior and interior spaces. Given its location between rural and the built environments the school could incorporate a number of educational elements that suggest possible connections. Areas of attention could include:

- Improving energy efficiency, in the types and amounts of building materials, and in the manner in which energy is collected, stored and used;
- Exposing process, be it education, energy use, nutrient cycling, etc.;
- Improving connections to and involvement in outdoor environments;
- Expanding educational programs to include a more substantial consideration of the environment, including environmental issues and benign or regenerative technologies;
- Utilizing different educational models that place more emphasis on applied and experiential learning; and
- Providing facilities that allow for a variety of community uses and activities.

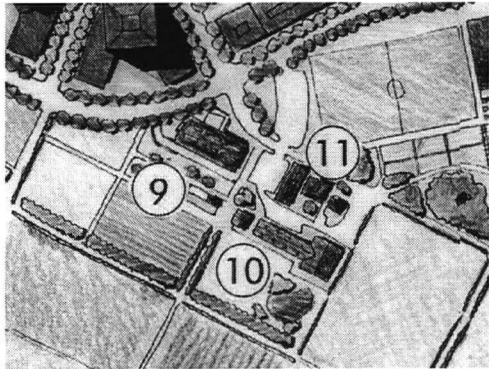
Programmatic Elements

Programmatic elements that would be included in the design of the Farm School are:

- | | |
|--|---|
| <ul style="list-style-type: none">▪ Teaching facilities that accommodate 500-600 students▪ A regulation sized gymnasium▪ 2 regulation sized outdoor fields▪ 1 smaller outdoor field area▪ A tot lot▪ Adequate staff and visitor parking▪ 3 tennis courts▪ 2 basketball courts▪ An outdoor classroom area▪ An integral solar aquatic facility▪ Incorporation of alternative energy technologies | <ul style="list-style-type: none">▪ A pond/stream system that collects, stores, and treats much of the water that falls on the site▪ 1 large teaching garden area▪ Several play areas where natural elements are highlighted▪ Edible or useful landscape plantings▪ In school facilities that allow for weekend or evening community activities or events▪ A system of pathways that connect the school to the Village, the Farm, and the University, Pacific Spirit Park, and local greenways |
|--|---|

This proposal provides a unique opportunity to extend the educational program of the school by placing it within a "heightened" environment where young minds could be exposed to a wide variety of environmental learning experiences.

4.2.3. Farm Centre Area



Drawings 10 and 11 show that South Campus Farm Centre area would be located at the southern terminus of East Mall, which provides the main point of entry onto the Farm (Appendix 1). This area would be a hub of activity and as such would contain three important programmatic elements:

- The UBC Farm Centre (10)
- The South Campus Community Centre (9)
- The Farm Market (11)

All of these facilities support programs that rely on community support and participation. As a consequence, they are best located at the main entrance to the farm, preferably in a fashion that requires the least amount of productive land. The resulting designs meet this requirement by situating these developments on an impacted area of the farm. The proposed buildings are situated in a way that takes advantage of the local topography and aspect. Building envelopes are reduced and positioned in a way that reduces the development of productive soils. Required parking areas are reduced by using parking facilities associated with the adjacent field activities.

The UBC Farm Centre

The Farm Centre would be the administrative heart of the farm. As such, the centre would consist of a main building that provides office space for core farm staff, and the following facilities:

- A public meeting room;
- Small kitchen;
- Resource room and library; and
- Two small second floor apartments for visiting staff and researchers.

The building is positioned over an area of impacted soil and overlooks the southern field areas of the Farm. A large deck is incorporated on the south side of the building to take full advantage of the southern exposure and to provide connections to the outdoors (Drawing 13, Appendix 1). Parking is provided along the north side of the building. Shared parking arrangements are provided in lots located between and to the north of the proposed Farm Market and Community Centre. A 0.5 ha demonstration garden complete with a retention pond is located directly adjacent to the Centre to provide visitors with direct educational and experiential opportunities (Drawings 10 & 11, Appendix 1).

The South Campus Community Centre

Originally intended to be located outside of the farm area, the Community Center was incorporated within the farm as a way of creating connections between the Farm and the Village. To reduce the need for a large on-farm community center an assumption was made that a number of community functions could be met by the elementary school facility. These functions would include the provision or sharing of classroom/workspace, and access to

playing fields and other outdoor recreation facilities. The resulting reduction in size would then allow for a beneficial integration within the proposed farm area. Within this arrangement the Community Centre would provide larger community meeting and resource rooms than those provided by the Farm School.

Similar to the other on-farm buildings, the facility would incorporate and reveal the latest in environmental technology (solar energy collection, rainwater capture and storage, treatment of wastes, etc.). The building would be sited along East Mall at the entrance of the farm on an area of impacted soils. Here it would take full advantage of the topography and open southern views. Associated with this development would be approximately 1 ha of land that would be cultivated, providing much needed community garden space to the residents of the high-rise apartments located adjacent to the Farm (Drawings 10 & 11, Appendix 1).

Farm Market

In keeping with the traditional practice of selling agricultural goods at the farm gate, I have located the Farm Market within this area of concentrated activity. Positioned at the southern terminus of East Mall, at the southern edge of the Village centre, and surrounded by complementary on-farm facilities, the Farm Market connects the "fruits" of the Farm with potential buyers. As a consequence, the Farm Market serves an important economic function within this area of concentrated on-farm development.

As illustrated in Drawings 10, 12 and 13 in Appendix 1, the Farm Market would include a market building that would allow for the display and sale of goods produced on the farm. An existing building, currently being used as a shop, would be incorporated into this development and would provide a space where goods could be prepared for sale in the market or for distribution to other areas of the community. Parking would be shared with the Farm and Community Centre facilities. The buildings and landscaping would be designed in a way that maximizes indoor/outdoor relationships and takes full advantage of the southern exposure.

4.2.4. Community Forest Area



Within the South Campus precinct an area of managed woodland would be retained. This area, the South Campus Community Forest, would consist of approximately 25 ha of forestlands divided roughly into five areas:

- The corner of SW Marine Drive and 16th Ave.;
- Along 16th Ave. across from Hampton Place development;
- An area along the boundary of Pacific Spirit Park at the north east area of the site;
- A small area located along the proposed East Mall greenway just south of the Paprican research facility; and
- The areas surrounding the UBC South Campus Farm area (Drawing 10, Appendix 1).

The South Campus Farm could provide the management of this forested area but management would be done to benefit the community as a whole. Consequently, management of these areas would be done in a sustainable fashion using a system of

harvest and management similar to that employed in small, sustainable woodlot systems. Merv Wilkinson, a UBC Agricultural Science Alumni, provides an excellent precedent of this on his southern Vancouver Island farm. The Wildwood Tree Farm is an internationally recognized example of how a small forest area can be sustainably managed while continuing to provide a substantial quantity of quality timber and other forest-botanical products (Loomis, 1990).

While the details surrounding the exact management of this area are beyond the scope of this thesis, it is anticipated that the community forest might be able to generate a number of products that would be of use to both the Farm and the South Campus community. These may include some wood for construction purposes but most likely should be able to provide a source of fuel wood, as well as an assortment of botanical products that could be distributed to the surrounding community through the Farm Market.

Ultimately, the South Campus Community Forest would provide a much-needed example of how a program of economic forest management could be successfully integrated with seemingly incompatible recreational and education programs. While examples of this integration exist in rural forests like Wildwood and within the rural community forests of North Cowichan, little has been done to develop this integration within our urban communities and forests.

An integrated working community forest would extend the overall program of the farm by:

- Expanding the economic base of the farm and the community;
- Increasing education and research opportunities, particularly in the area of agroforestry;
- Providing a regenerative source of fuel, fibre, and forest botanicals;
- Expanding the range of forest activities; and
- Providing a unique example of sustainable urban woodland management.

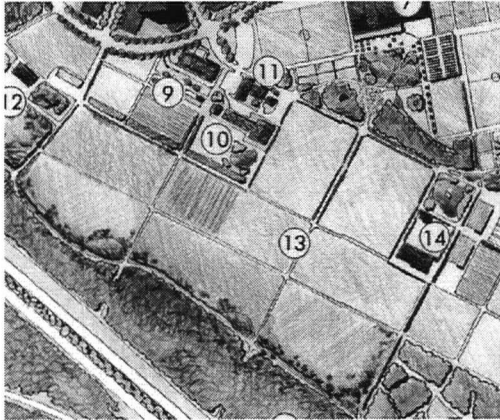
Programmatic Elements

There are a number of important programmatic elements that could be integrated into the designation and management of the community forest areas. They include:

- Areas of sustainably managed forest
- Incorporation of an extensive public trail system
- Conservation areas
- Harvest areas
- Wildlife protection and enhancement elements
- An interpretive program
- Incorporation of proposed SW Marine and East Mall greenways
- Areas for agroforestry projects
- Research and education areas and facilities

Public education and safety, and environmental sensitivity would be paramount and therefore would require careful consideration. An important feature of the community forest would be the integration of an applied agroforestry program, currently identified as a critical academic component of the South Campus Farm program and an area of academic interest shared by the Faculties of Forestry and Agriculture.

4.2.5. Central Farm Area



The central farm area refers to those farm areas that would be actively cultivated or used to support livestock. This area is generally described as the 12 ha of open fields that surround the proposed Farm Centre. These field areas are in turn, bounded by the proposed Community Forest, the Farm School and the Market Garden area. To minimize the need for further development the current field situation was accepted. These areas could be managed under a rotational pasture/crop regime. Under this system of management, on any given year several hectares of field could be brought under active cultivation leaving the remainder as pasture, which

would supply the fodder necessary to support a contingent of livestock. The management of this area would be done using a rotational scheme, where after a time cultivated areas would be returned to pasture and pasture areas would be brought under cultivation.

Given the sustainable underpinnings of the Farm there would be a desire to meet the feed requirements of all on-farm animals with forage grown on the farm. Given that roughly 8 ha would be available as pasture at anyone time, the farm can only support a small population of animals – roughly 16 animal units. This translates roughly into a small herd of 5 small dual-purpose cows with calves, 5 pigs, a flock of 30 sheep, a pair of smaller-type working horses, and a large flock (100+) of dual-purpose chickens. The exact numbers of animals would vary depending on the quality of forage and types of animal breeds.

The incorporation of animals requires a certain amount of infrastructure beyond the availability of pasture. Most of these animals would require some type of shelter throughout the year, during times of inclement weather and around birthing. To meet these requirements and provide for the storage and stockpiling of feed, a small bank barn has been placed adjacent to the market garden. A bank barn is a barn type that takes advantage of a sloping situation to provide at ground access at two different levels. This ability to access two different levels or stories provides for efficiencies, which reduce the need for a large structure. The development of a retention pond to the north of the barn provides the fill necessary to develop a level paddock that allows access to the second story of the barn (Drawing 13, Appendix 1). Given this improved access, the second floor could accommodate other non-livestock related activities such as barn dances, meetings, and exhibitions.

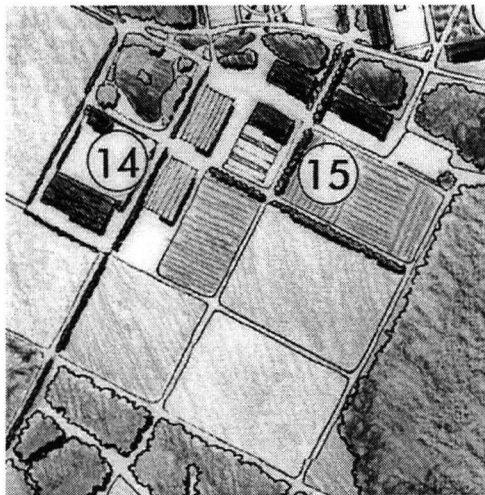
Permanent fencing is another type of field infrastructure that is required for the containment of livestock. Much of the fencing surrounding the margin of field areas could be supplied through the use of hedgerows. These "living" fences would have the added benefit of providing habitat for wildlife, supplemental forage for livestock, additional crops for harvest,

and shelter from wind. Given the permanent nature and the amount of time required to fully develop these “fences”, they have been placed along field margins in a manner that encloses the outside boundaries while maintaining the internal contiguity of the fields. This internal openness allows for a wide variety of field programs such as rotational grazing regimes that utilize portable electric fencing, and events that require large open spaces such as fairs and dog trials.

Areas of water capture and retention that reduce the reliance on City water are included within the central farm area. As indicated in Drawings 11 and 12 (Appendix 1) these are located in a number of places that currently exhibit water-holding capabilities. Water that collects or is stored in these ponds would be available to irrigate crops and livestock. The incorporation of alternatively powered pumps such as windmills or solar pumps would allow this water to be moved to storage ponds or cisterns located at high points on the Farm. Water stored in this way could then be piped throughout the farm using gravity pressure.

A community-type of infrastructure is provided in the central farm area through the location and development of greenways and public right-of-ways. Most people find the open nature of agricultural fields very attractive and interesting. Situating greenways and pathways along the field margins and existing laneways respectively, includes and connects the surrounding community in a very simple way. Potential vandalism and theft should be prevented through the inclusion of caretaker housing within a number of the proposed on-farm developments.

4.2.6. Market Garden Area



The market garden is located in the area of the Farm currently occupied by the Botanical Gardens Nursery. There is a very real possibility that this nursery facility will be moved onto Mid Campus to an area closer to the main entrance of the Botanical Gardens. If this happens it will leave behind an area that could easily be converted to a market garden operation.

The Market garden area as realized in this plan would occupy an area of approximately 4 ha and would provide fresh vegetables and fruits for sale and distribution through the Farm Market. The program of the Market Garden would be extended through the provision of organic, horticulture training

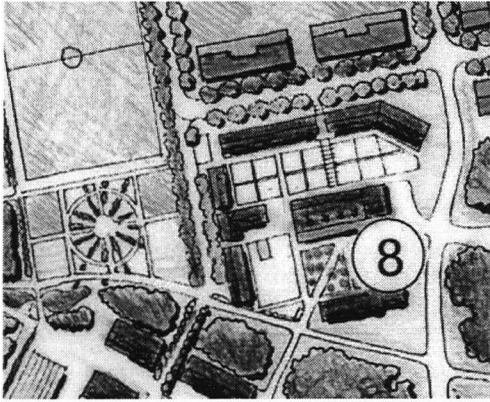
and by supplying the adjacent residential college with fresh fruit and vegetables. Horticulture training would involve twenty or so interns taught over the course of 6 to 8 months in a program similar to that provided at UC Santa Cruz. There the interns pay for the opportunity to live, work and learn on an organic farm. At the end of 6 months they have a certificate in organic horticulture, which allows them to work on organic farms or start operations of their own (CASFS, 2001). An internship program would extend the educational offerings of the Farm while generating revenue both through the production of marketable food items, and associated tuition payments.

While much of the existing nursery facilities would adequately support such an operation there would be a need to develop a teaching/lab facility and a shop. In order to reduce the likelihood of theft and vandalism two residential suites could be provided above the shop

building. The proximity to the barn would also allow for the regular monitoring of livestock. Interns would be provided with housing within the residential college located immediately to the north of the garden area.

Vehicle access to the Market Garden would be from the former Wesbrook Mall with a small amount of parking provided adjacent to the teaching/lab facility. Pedestrian bike access would be provided by way of the East Mall Greenway, which swings past, and between the garden and residential college. Additional connections would be provided from the north by way of the realigned Wesbrook Mall, and from the south through the Arboretum.

4.2.7. Residential College

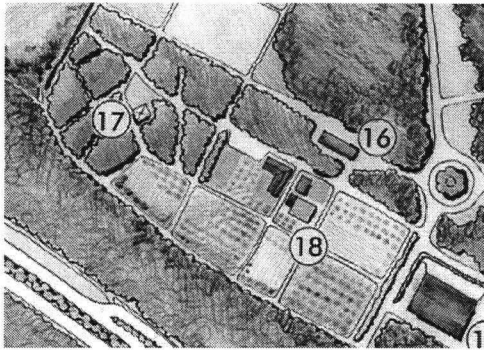


A 1 ha residential college located at the southern end of the realigned Wesbrook Mall provides housing for a population of approximately 80 students, researchers, visiting faculty, and lecturers associated with the South Campus Farm. The college is modelled after the two current on-campus graduate colleges, Green College and St. John's College where students are housed and fed within a collegial community environment that supports the academic mission of the university. This college would differ from these on-campus precedents in a number of ways.

- Most of the fresh vegetables required to feed the residents would be grown within its immediate precinct. To the extent possible, the South Campus Garden would meet additional food requirements. Those required provisions not available from the Farm would be sourced from local growers and business.
- The College would treat and recycle its own wastes through the incorporation and management of a solar aquatic facility.
- Rainwater would be captured and stored on site for irrigation and sanitary uses.
- A number of alternative energy sources would be incorporated into the facility and would be managed by the residents.
- College residents would participate in the day-to-day management of the facility including the preparation of daily meals, washing up, regular maintenance, laundry, etc. thereby reducing the need for paid staff and supporting the development of a supportive community atmosphere.
- College residents would be involved in some academic aspect of the Farm, Village or University.

The idea behind this arrangement is to provide a living example of a sustainable community. Similar to the John T. Lyle Center for Regenerative Studies residents at the College would be provided with a unique educational experience additional to the research, learning and/or teaching that they might be doing on the Farm, in the Village or up on campus. An opportunity exists to develop a residential community that demonstrates the principles of sustainable living through applied educational living. Such a program would nicely compliment and extend the other proposed Farm programs.

4.2.8. Nursery Area



The nursery area includes three main components:

- The UBC Plant Operations Nursery (18)
- An arboretum (17)
- A composting facility (16)

Apart from the composting facility the nursery and arboretum are merely reconfigurations or improvements to existing infrastructure. The composting facility is an addition that anticipates the University's interest in reducing the organic waste that currently leaves the campus.

Nursery

The existing Plant Operation Nursery has been retained and incorporated within the South Campus Farm. Under a new arrangement the Farm would run the Nursery under contract for the University. In addition to meeting the University's plant needs the Farm would be able to develop a program for the propagation and introduction of productive or useful plants. This is a new market opportunity for British Columbia that could extend the Farm's proposed agroforestry and organic horticulture programs while adding another economic enterprise. The redevelopment and incorporation of the nursery would also require the development of a new and cooperative relationship between the Farm and Plant Operations staff.

Arboretum

The arboretum would retain and improve on the existing rhododendron nursery. Improvements would include the additional complimentary plantings of useful perennials, shrubs and trees a small interfaith chapel and system of access and connection to the Farm and Southwest Marine Drive. Most significant of these improvements is the interfaith chapel. The arboretum currently exists as a kind of sanctuary, tucked into the southern-most corner of the Farm. It is a peaceful, quiet space – a space that, much like the Nitobe Garden, encourages inner reflection. The Interfaith Chapel would be the Farm's teahouse. The Chapel would extend the program of this site and the Farm to include and recognize the importance of a spiritual dimension. It would also extend the kind of activities that could be accommodated on the Farm.

Composting Facility

The inclusion of a composting facility within the Farm is a concrete way of connecting the Farm with the University. Currently, the University is exploring ways of reducing the flow of organic waste from the campus while the Farm is looking for ways to increase the fertility of its soils without the use of artificial fertilizers. There is a tremendous opportunity for the Farm to be able to incorporate this organic waste thereby helping to close the University's nutrient loop. In this way the Farm would act as green infrastructure for the University. To encourage the efficiency of this "marriage" of needs, the Farm could provide a potential location for a facility that would compost these wastes. As shown in Drawings 10 and 11 (Appendix 1), this facility is located next to the nursery in an area that currently is being used to store soil and other landscape materials. The development of a southern entrance to the South Campus would allow for the movement of material into this site without needing to pass through the residential community. The composting facility is located a distance away from the residential neighbourhoods to reduce the potential for contact with any unpleasant

smells. In addition the composting systems currently under consideration, generate little or no unpleasant odours.

4.3. SUMMARY

It is impossible to fully explain the nature to of these proposed programs within the confines of this thesis. This is mainly a result of the number of programs that were considered but is further complicated by their interconnectedness and resulting synergies. While the full revelation of these details will be necessary if any of these programs are considered for development, the real value in this exercise is the revelation of the opportunity that exists if the South Campus is developed with integrity, due diligence, and creativity. These programs and designs are just a taste of what is possible.

5.0 ASSESSMENT AND CONCLUSION

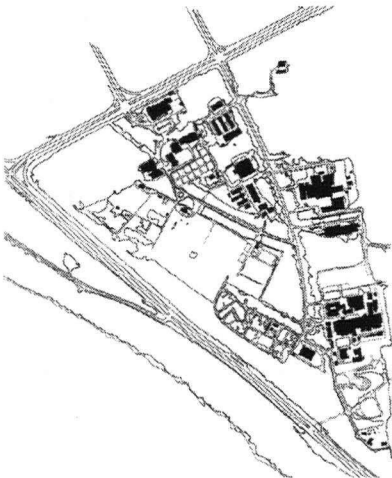
5.1. REVIEW OF DEVELOPMENT OPTIONS

What follows is a summary of the various options that were considered over the course of this thesis project. The development options were considered in light of:

1. The amount of built infrastructure required;
2. The amount open space provided, be it recreational, working or natural;
3. The residential population that could be accommodated;
4. The extent to which the option supports the outcomes of the UBC OCP and CCP processes;
5. The integrative nature of the development;
6. The manner in which the University's academic mandate is considered or supported;
7. The ability to accommodate/incorporate existing site uses; and
8. The ability of the resulting community to support the economic, ecologic and social principles of sustainability.

An initial assessment of the five development options suggests that the final alternative proposal provides the least amount of infrastructure per capita while supporting a projected final population of 5000. It incorporates most if not all of the requirements for the future South Campus development established by the OCP and CCP processes. It is integrative in nature, considering the needs of current site users, while establishing strong linkages with on and off-campus communities through the incorporation of greenways, public access and transport, and compatible program placement and development. Existing research and education facilities including the UBC South Campus Farm are incorporated and used to enhance the nature of the development. The design and projected development of the community reflects a deep commitment to principles of ecological, economic and social sustainability. It does all this and houses the requisite 5000 souls while allowing for the retention and incorporation of the UBC South Campus Farm.

5.1.1. Current Situation



Available residential housing is well below the desired 5000. Currently there are only two on-site apartment suites which house a total population of 5. Existing infrastructure in many areas is aging and unkempt which suggests that much of this area is currently under appreciated and under utilized by the University. Built infrastructure is limited to <50% of site. Most of the remaining undeveloped areas are in a naturalized or naturalizing condition. Currently most of the South Campus area is reserved for research purposes. While exact figures are difficult to obtain the University has been claiming that the South Campus lands are worth between \$4 and \$10 million an acre (Kalke, 1999). As a consequence, this situation is unacceptable ecologically, economically and socially.

5.1.2. UBC Properties' Proposals



The only difference between these proposals is the configuration and placement of the proposed bioscience facilities. This option maximizes the residential development to meet the OCP goal of 5000 residents. This residential development will include a high-density town centre with lower density residential areas for an overall density rating of 1.2 FSR. A large elementary



school is situated at the heart of community. Bioscience facilities, concentrate the activities of the current South Campus residents (Forestry, Botany, Zoology, Animal Care, Agricultural Sciences, and the Botanical Gardens (11 ha from ~60 ha). Built infrastructure maximized to >75% of the site requires the removal of most if not all of the natural vegetation and habitat areas. Less than 20% of the South Campus land area will be retained for research. Ultimately these proposals support the interests of UBC (the generation of a substantial endowment) at the expense of potential land-based teaching and research opportunities.

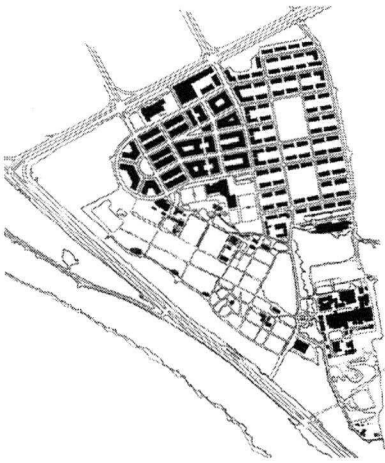
5.1.3. Initial Alternative



My initial development proposal focused on the area to be retained as the UBC South Campus Farm. The consequence of this action severely reduced the potential residential area, lowering the projected population to 3000. The non-farm areas indicated in the UBC Properties' proposals, which included the proposed town centre and eastern residential area, were accepted as is. The Farm areas located in the area bounded by 16th Ave., South Campus Road, Wesbrook Mall and Southwest Marine Drive were retained as a working farm. As a consequence, built infrastructure was reduced to ~50% of the site. The Farm would serve as the ecological infrastructure for the site. It would also accommodate 80⁺ residents. The elementary school would remain at the heart of community but would be connected more directly to the

Farm. Approximately 60% of the South Campus would be retained for research. While this option allows for the retention and integration of the South Campus Farm it does so ignoring the direction provided by OCP and at significant economic expense to UBC. This option does not harmonize the needs of the Farm with the needs of the University. It also does not fully explore the relationship/interconnection between the Farm, the University and the proposed community development.

5.1.4. Final Alternative



The final option that was completed as part of this thesis allows for the retention of a sizeable farm area with a corresponding areal reduction and density alteration to the potential residential development area. However, it accomplishes this within OCP guidelines and meets the goal of 5000 residents. The proposed developments are redesigned to accommodate density and minimize impervious cover, while maximizing useable green space and solar orientation. The south farm area is redesigned and better integrated into the community through the placement of common amenities such as a community centre, elementary school, farm residence, and greenway. On-site infrastructure coverage is further reduced from the initial alternative proposal to <50% of the site. Ecological

infrastructure is retained and enhanced on the farm between residential buildings and within the surrounding community forest. More than 60% of South Campus is retained for research. This option provides benefits to the University, to those interested in retaining the South Campus Farm and future community residents.

5.2. CONCLUSION

With expected development of the South Campus lands the University of British Columbia has a unique opportunity to retain, redesign, and integrate the existing farm and forest lands in a manner that supports its interests and demonstrates how working landscapes can benefit their surrounding communities.

The UBC South Campus Farm is a viable proposal, one that supports and extends the ecological, economic, and social interests of the GVRD and UBC as articulated by their strategic planning documents. This thesis demonstrates that if given the consideration it deserves, the UBC South Campus Farm could have a tremendously beneficial effect on the proposed development of this area.

In a world that is rapidly succumbing to the effects of environmental degradation and resource exploitation the University has a responsibility to demonstrate leadership and excellence in the area of sustainability as described in *Trek 2000* through the creative exploration of an alternative development process. This thesis project indicates that an alternative of this nature is possible and necessary, and the University and the world would be a better place for it.

I end this thesis with a quote from Wendell Berry, which describes far better than I can, the changes in human behaviour required to see developments like that of the South Campus and the UBC South Campus Farm realized in a way that is truly beneficial.

"The standards of our behaviour must be derived, not from the capability of technology, but from the nature of places and communities. We must shift the priority from production to local adaptation, from innovation to familiarity, from power to elegance, from costliness to thrift. We must learn to think about propriety in scale and design as determined by human and ecological health. By such changes we might again make our work an answer to despair." (2000).

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APPENDIX 1 - PRESENTATION DRAWINGS

DRAWING 1 - BEGINNINGS

DRAWING 2 - HISTORY: AGRICULTURE AT UBC

DRAWING 3 - SITE INFRASTRUCTURE

DRAWING 4 - APPROACH: REGENERATIVE DESIGN STRATEGIES

DRAWING 5 - DESIGN FRAMEWORK: ECOLOGY

DRAWING 6 - DESIGN FRAMEWORK: ECONOMY

DRAWING 7 - DESIGN FRAMEWORK: INTEGRITY

DRAWING 8 - DESIGN FRAMEWORK: BEAUTY

DRAWING 9 - CONCEPTUAL SCHEMES

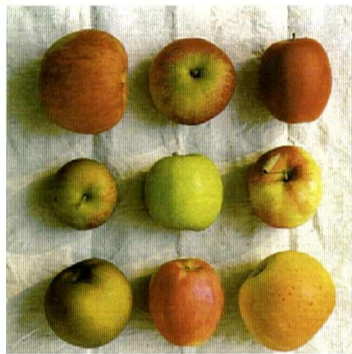
DRAWING 10 - SOUTH CAMPUS PLAN

DRAWING 11 - UBC SOUTH CAMPUS FARM

DRAWING 12 - COMMUNITY CROSS SECTIONS

DRAWING 13 - FARM CROSS SECTIONS

DRAWING 14 - DEVELOPMENT SCENARIOS: COMPARATIVE OUTCOMES



The UBC South Campus Farm provides a unique opportunity to integrate a working research farm within a newly planned community development. This presentation describes how the Farm could be transformed into a beneficial partner in the creation of an integrated sustainable development that supports the ecological, economic, social, and educational interests of the University. I have also redesigned the proposed community development to improve the connection with the Farm. This design investigation moves beyond theory and provides a practical suggestion of how a permanent, mutually beneficial and economically feasible sustainable community farm could be realized at the University of British Columbia.



UBC SOUTH CAMPUS FARM

UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER, BC

Beginnings

DRAWING 1

base::design::detail D. MASSELINK 01.2001

history PRESENT FUTURE



1870-81 Area selectively logged. **1888** Provincial Legislature passes the *University Act* thereby establishing UBC. **1910** Pt. Grey selected as future site of UBC. **1914** Work begins on preparing the land & is subsequently halted by WWI. **1915** UBC opens temporary Fairfield facilities. **1919** Subjected to an intense forest fire. **1922** The Great Trek occurs. **1923** Construction of UBC's first buildings begin. **1925** UBC moves to Point Grey.

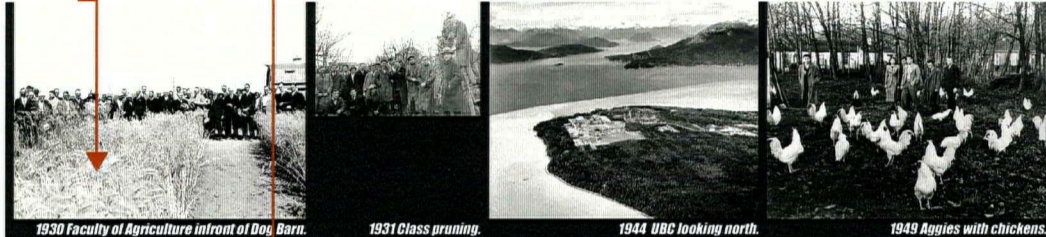
past

The University of British Columbia is found within the traditional territory of the Musqueam First Nation. The Musqueam inhabited the Point Grey area for several thousands of years and until the time of contact this area were their hunting grounds and the beaches their pastures.

In 1869, UBC was surveyed by the Crown for commercial logging. It was then selectively logged by the Hastings Sawmill Company between 1870 and 1891. Labour intensive, selective harvest methods left many seed trees, which supported the rapid regeneration of the forest. In the early 1900's the Provincial Forest Service issued timber sales for the remaining salvageable redcedar trees to feed the rapidly growing cedar shake industry.

Agriculture played a very important role in the development of the campus. Around 1915 after the area was cleared the Faculty of Agriculture was involved in the clearing of debris to prepare the land for agricultural research and the future university. UBC's first farm was established along what is now West Mall, directly west of the Chemistry building. Over the subsequent years the Faculty of Agriculture's interests shifted to the south end of main campus where they established their animal facilities. Remnants of this time include the Barn Coffee Shop, the Landscape Architecture Studios and Horse Barn, all located on Main Mall.

As the University expanded to accommodate a growing student population agricultural activities were shifted from the main campus area towards Mid Campus. From the 50's until early the 80's agricultural research and teaching facilities occupied most of the mid campus area. In the mid 70's development shifted agriculture from mid campus across 16th Ave. to the recently cleared South Campus area.



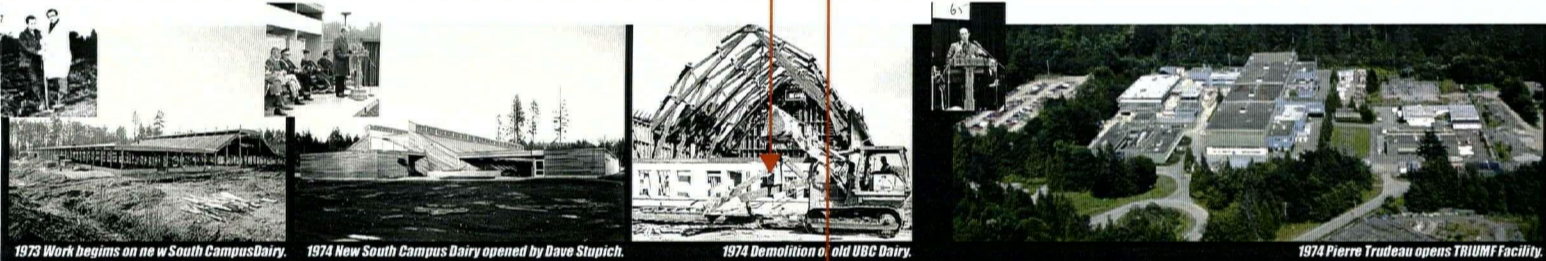
1932 UBC almost closes due to the *Great Depression*. **1939** Enrolment reaches 2400 students. **1947** Returning WWII veterans push enrolment to 9374 students forcing UBC to develop temporary facilities.



1951 New Horticulture Greenhouse facility opened.



1965 MacMillan construction started. **1966** Clearing of South Campus begins. **1967** MacMillan Building completed. **1968** Pig, sheep & beef facilities established at South Campus site. **1969** Construction of TRIUMF facility begins.



1973 Construction of the South Campus Dairy Facility begins. **1974** South Campus Dairy officially opens. **1975** Old dairy buildings demolished. **1976** TRIUMF opens. **1975** B Lots established. **1976** Construction of South Campus Animal Care Facilities begin.

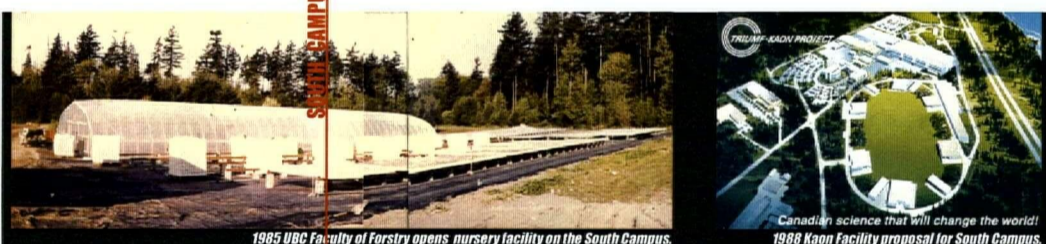
present

Today agriculture at UBC is faced with the prospect of a third displacement. Due to spatial constraints and escalating land values, landbased agricultural research and activities are not seen to be a practical and economically sustainable use of the remaining campus lands.

In 1997 UBC's Official Community Plan was passed. In an effort to reduce commuter traffic flows it called for a doubling of the campus's current residential population through the provision of more residential housing. In order to meet the housing recommendations of the OCP, the last remaining on-campus working landscapes - the vestiges of our agricultural heritage in the South and Mid Campus areas, were identified for development. Prompted by this development threat the Faculty of Agricultural Sciences has become a leading participant in the development public planning process. Students, faculty, staff and community members have come together to develop and promote a vision for agriculture at UBC that is informed by the principles of sustainability and considers and better integrates instruction, learning, research, and community.

future


What does the future hold for land based agricultural practices at UBC? If student response to recent changes to the Faculty of Agricultural Sciences' curricula provides any indication, the future is full of hope. Students are genuinely excited by the possibility of retaining landbased, sustainably managed, integrated, participatory agro-ecological systems here on the UBC campus that demonstrate and challenge the Faculty, University and society. Over the last century agriculture has left a rich legacy to UBC. As we enter the 21st Century with all its associated ecological challenges, agriculture and in particular agricultural studies, provides a perspective that is rich with possibility. The UBC Farm is but one demonstration of this possibility.



1980 South Campus Animal Care/Zoology facilities completed. **1981** Discovery Park established at South Campus. **1982** Construction of Avian & Quail Research Centre begins on former South Campus dump site. **1985** UBC South Campus Forestry Nursery established. **1987** South Campus Avian & Quail Research Centre completed. **1988** UBC Real Estate Corporation created. **1988** TRIUMF/Kaon project initiated.



1991 South Campus Forestry Nursery closes. **1992** Kaon proposal stopped. **1993** UBC hosts meeting of Bill Clinton & Boris Yeltsin. **1995** The C.K. Choi Building opens. **1996** UBC South Campus Dairy Facility closes. **1997** UBC OCP completed. **1998** UBC hosts APEC. **1999** UBC begins the Comprehensive Community Planning process. **2000** UBC completes CCP process. **2000** Faculty of Agriculture Sciences opens new Dairy Centre in Agassiz.



UBC SOUTH CAMPUS FARM

UNIVERSITY OF BRITISH COLUMBIA VANCOUVER, BC

Agriculture at UBC

DRAWING 2

base::design::detail D. MASSELINK 01.2001

HOME PLACE



UBC's South Campus precinct is triangular in shape, the southwest and northwest boundaries created by two major University access roads, Southwest Marine Drive and West 16th Avenue, respectively. The eastern leg of the triangle is formed by the western boundary of Pacific Spirit Park. The South Campus area is sparsely developed with much of its lands (> 85%) remaining in forest, field or nursery. The photogenic South Campus Road partially bisects the site effectively separating the agrarian field, nursery and research areas from the other research developments. The entire area is surrounded and visually protected by mature second growth forest.



ecological infrastructure

topography & drainage

UBC's South Campus is located on the Point Grey plateau, which is elevated approximately 100 metres above sea level. This area has an average slope of 4% towards the south and southwest with a slope range of 2% to 6%. As a consequence there are no notable landforms on the site. Westbrook Mall lies along the main ridge in the area.

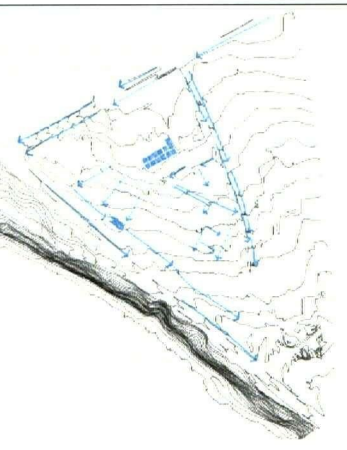
The orientation of the site allows for excellent afternoon solar gain. Potential views to the southwest of Georgia Strait are blocked by vegetation along South Campus Rd. and Southwest Marine Dr.

Permeable soils and even, gradually sloping topography mask the effects of surface drainage. In addition drainage patterns have been altered by development. Consequently it is difficult to determine the exact drainage pattern of surface and subsurface water. Given the general south-southwest aspect it can be assumed that much of the water drains in the direction of this slope. Areas along South Campus Road, Westbrook Mall and along the southern boundary of the 'South Field' these overland flows have been captured by drainage ditches. The water collected in these improvements appears to be channelled to the southeast corner of the site where it passes under Southwest Marine Drive and down the cliffs to the ocean.

The soils of the South Campus lands consist of two orders: Podzolic and Gleysolic. The Podzolic Order is represented by the Bosc Series, a Mini Humo-Ferric Podzol. The Gleysolic Order is represented by the Heron Series, a Rego Humic Gleysol.

Bosc soils occur throughout the South Campus as a gravelly sandy loam material, often in association with Heron soils. The parent material consists of a mantle of wave washed lag gravels approximately 1-2 m thick overlying Newton Glacio-Marine deposits. Bosc soils are generally well to rapidly drained but can be affected by the presence of Newton deposits and Heron soils which restrict drainage and contribute to the creation of perched water tables. The Bosc soils have an Agriculture Capability Classification of 4, which is limited by factors such as stoniness and moisture availability during the growing season.

Heron soils occupy depressional areas in the western and mid areas of the South Campus, often in association with Bosc soils. The parent material consists of Sunny Side Sands. Drainage is poor due to the depressional nature of the associated topography and the shallowness of a restrictive subsurface Newton Stoney Clay layer. Heron soils have an agriculture capability classification of 5 with limiting factors being stoniness and poor drainage.



vegetation

Given the history of this site much, if not all, of the vegetation has been effected by past developments. Clearings that were developed in the 1970's today are either covered by built infrastructure and parking lots or by agricultural fields, animal housing and horticultural/forestry operations (greenhouses or fields). Between or surrounding these developments is a fringe of the remnant second growth forest. Red Alder, Douglas Fir, Bigleaf Maple and Western Redcedar dominate the vegetation of these forested areas. More recently disturbed areas exhibit greater numbers of Red Alder and Bigleaf Maple. In these areas the understorey is quite dense with a mixture of young Douglas Fir and Western Redcedar trees. In those areas with a more mature forest the understorey is less dense with a mixture of salal, sword fern and Western Hemlock saplings.



climate

UBC's South Campus has a Mediterranean type of climate that is characterised by warm, rainy winters and cool, dry summers. The Vancouver Island and Olympic Mountains protect the area from the direct onslaught of Pacific storms while the Coast Mountain Range shields the area from most major influxes of Arctic air during winter months.

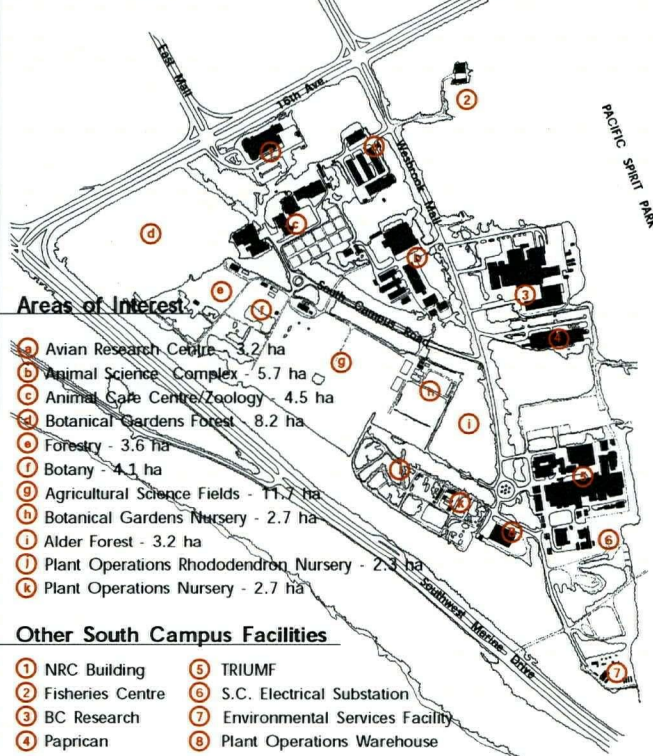
The area receives an average annual rainfall of 1200 mm, the majority of which falls in the months between October and March. December tends to be the wettest month and August the driest. Soil moisture deficiencies occur between June and September.

Mean daily temperatures peak in August around 17°C and reach a low of 2.5°C in January. On average the number of frost-free days exceeds 200. Hours of sunshine peak in July with 1461 hours on average received during the April to October growing season. 769 accumulated heat is received during the April to October months (Huglin Index of 1094).

The mean annual wind speed for the area is 7.9 km/hr with the prevailing winds mainly originating in the West. Winter storms generally blow in from the southwest.

structure

jurisdiction and infrastructure



Areas of Interest:

- (a) Avian Research Centre - 3.2 ha
- (b) Animal Science Complex - 5.7 ha
- (c) Animal Care Centre/Zoology - 4.5 ha
- (d) Botanical Gardens Forest - 8.2 ha
- (e) Forestry - 3.6 ha
- (f) Botany - 4.1 ha
- (g) Agricultural Science Fields - 11.7 ha
- (h) Botanical Gardens Nursery - 2.7 ha
- (i) Alder Forest - 3.2 ha
- (j) Plant Operations Rhododendron Nursery - 2.3 ha
- (k) Plant Operations Nursery - 2.7 ha

Other South Campus Facilities

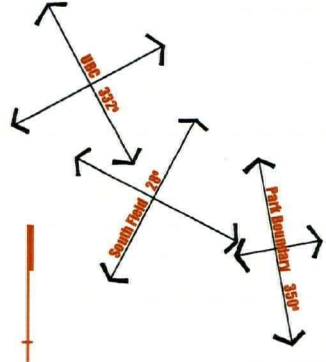
- (1) NRC Building
- (2) Fisheries Centre
- (3) BC Research
- (4) Paprican
- (5) TRIUMF
- (6) S.C. Electrical Substation
- (7) Environmental Services Facility
- (8) Plant Operations Warehouse

orientation

UBC has responded to the cardinal grid in a number of different ways. To maximise the connection and views to Howe Sound the central University axis was shifted 332° from True North and positioned along the Main Mall ridgeline. This decision created a grid pattern of supporting streets that continue to influence the orientation of development in the Main and Mid Campus areas. This primary grid influence was broken in the South Campus area.

South Campus provides three different responses to the cardinal grid. The NRC building and Bio Science facilities continue the expression of UBC grid south of 16th Ave. The Fisheries, BC Research, Paprican and TRIUMF facilities are shifted 350° from True North in response to local topography and the western boundary of Pacific Spirit Park. This new grid allows for the best solar orientation on campus. The Forestry, Botany, Agriculture and nursery facilities in the South Field area south of South Campus Rd. are shifted only 28° from the cardinal grid in what appears to be a response to the local topography and dominant southwest views.

UBC Property's proposal for the South Campus provides a somewhat unstructured or flexible response to each of these grid influences



design methodology

Given the Faculty of Agriculture Sciences', the University's and society's increasing interest in and concern for the environment I have utilised and applied many of the principles of sustainable or regenerative design in my consideration of UBC's South Campus lands.

In an effort to deal with the complexity of an environmental design approach I developed a methodology that helped me consider the application of regenerative design in this project. The resulting design methodology consists of three components: the **base**; the **design**; and the **detail**.

Base became the most important and therefore most extensively investigated aspect of the design process and was extensively used during the development of the eventual designs. It includes historic and site information, a summary of the basic design approach, and a detailed description of the design framework used to extend and elaborate the design approach. **Design** is concerned with the primary elements of the proposed design. **Detail**, is an extension of design. It is used to develop a better understanding of the design and provide a suggestion of possible development scenarios.

UBC SOUTH CAMPUS FARM

UNIVERSITY OF BRITISH COLUMBIA VANCOUVER, BC

Infrastructure

DRAWING 3
base::design::detail D. MASSELINK 01.2001

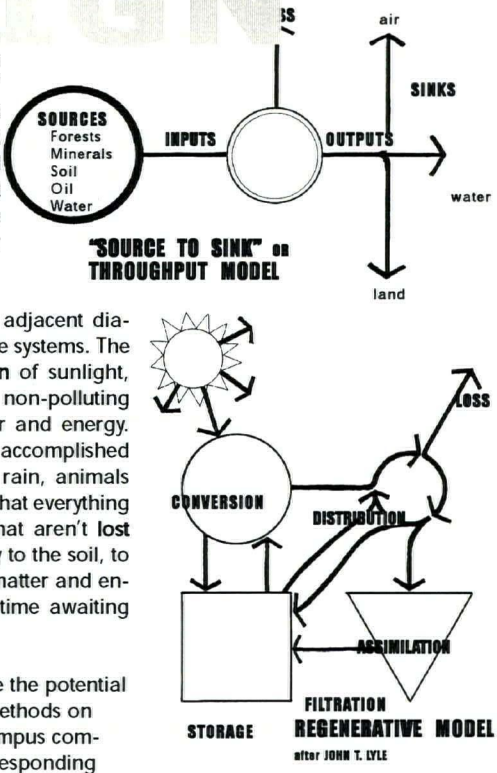
strategies

regenerative design

The challenge for ecological designers is to move away from "linear" approaches that consider resources as infinite. This requires designers to think about resources differently and develop regenerative systems that reconnect/recycle outputs, and utilise renewable, non-polluting and longer lasting inputs.

The late John T. Lyle developed the adjacent diagram method to describe regenerative systems. The diagram begins with the **conversion** of sunlight, the primary source of contemporary non-polluting energy, into various forms of matter and energy. **Distribution** of matter and energy is accomplished through mechanisms such as wind, rain, animals and people. **Assimilation** recognises that everything is recycled. Materials and energy that aren't lost through entropy are returned, largely to the soil, to be reutilised. **Storage** occurs where matter and energy is held inactive for periods of time awaiting eventual reuse.

I have used Lyle's diagram to explore the potential application of regenerative design methods on five critical elements of the South Campus community, and generate a series of corresponding design principles, goals, and strategies.



community



principle:
Cultivate complete, dynamic and regenerative communities

goals:
Promote a sense of place.

Integrate work, residence, study, research and recreation.

Foster pride in and commitment to the local community environment.

Create safe, healthy, participatory, empowering living environments.

Allow for adaptation/change.

Maximize diversity.

design strategies:

Involve the community.

community planning/design processes

community governance models

Emphasise the local.

place-based design

Adaptable designs.

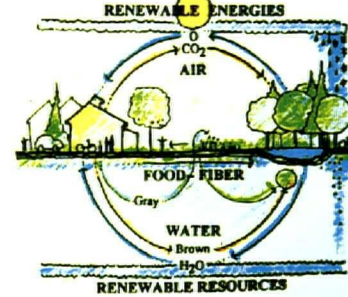
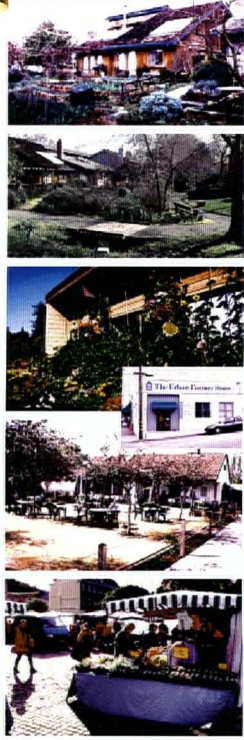
retain open space

accommodating building envelopes

Design for children.

Emphasise community spaces.

Develop community programs.



Regenerative communities are concerned with the beneficial integration of human settlements within nature. This concern extends beyond the development of a healthy, substantive community life that emphasises local and long-term relationships. There is a genuine interest in the environment, which includes care for, connection to and situation in. Regenerative communities, while a far cry from the utopian ideal, suggest what a truly ecological lifestyle might be.

nutrients

principle:
Develop healthy, productive soils.

goals:
Minimise on-site nutrient loss.

Minimise the area covered by built infrastructure.

Conserve and improve use of existing soil resources.

physical design strategies:

Concentrate development

narrow streets

limited paved parking

cluster developments

reduced building footprints

multistorey buildings

Maximise use of site features

maximise solar orientation

equalise cut and fill

reuse existing infrastructure

use natural drainage features

appropriate placement of infrastructure

incorporation of existing vegetation

On-site nutrient cycling

solar aquatics

composting toilets

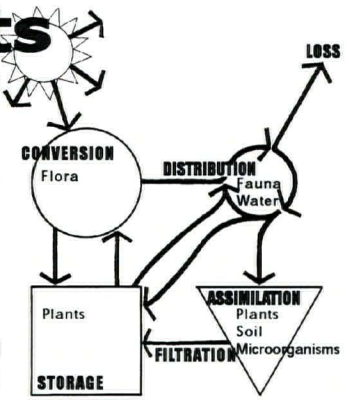
greywater recycling

composting systems

biofilters

animals

green manures



The capture and cycling of local nutrients is an important characteristic of regenerative communities. Whenever possible nutrients should be captured, treated and reapplied within the community. There are numerous technologies available that make it possible to return vegetable, animal and even human waste back to the local landscape in a way that improves soil conditions and ultimately local productivity.

water

principle:
Protect, conserve, enhance and cleanse water.

goals:
Reduce water consumption.

Utilize on-site water sources

Maximize water conservation, collection, storage, recycling and multiple use.

Eliminate off-site discharge of untreated wastewater.

physical design strategies:

On-site water retention

constructed wetlands

permeable swales

cisterns

Water cleansing and reuse

solar aquatics

biofilters

greywater recycling

water recycling

Water conservation

xeriscaping

composting toilets

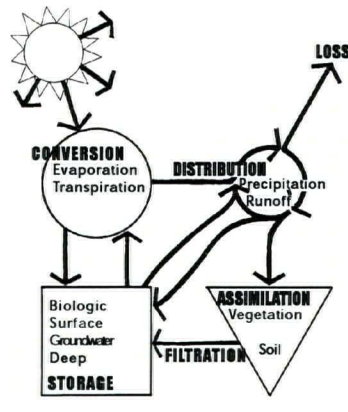
efficient water fixtures

greywater recycling

water harvesting and

Passive delivery systems

gravity delivered irrigation water



Water is an essential site element. Humans require approx. 4 - 8 litres per day yet, on average, consume 600 litres per day (indoor and outdoor household use). Regenerative communities rely on on-site water sources the availability of which, dictates use patterns. Here in Vancouver on-site water availability is seasonal, needs are generally met in the winter/spring months and challenged during the summer and fall. Conservation and retention strategies would have to be geared for the summer and fall.

food & fibre

principle:
Maintain, enhance and create healthy abundant landscapes.

goals:
Provide the community with locally grown organic food.

Reduce the need for off-site food and fibre sources.

Manage existing forest areas for long term conservation and production.

Improve long term site productivity.

physical design strategies:

Alternative, diverse production

methods,

agroforestry

permaculture

biodynamic farming

organic farming and gardening

aquaculture

Local food production

community farm

backyard and rooftop gardens

school and business gardens

local market garden

Local use of nutrients

community composting

solar aquatics

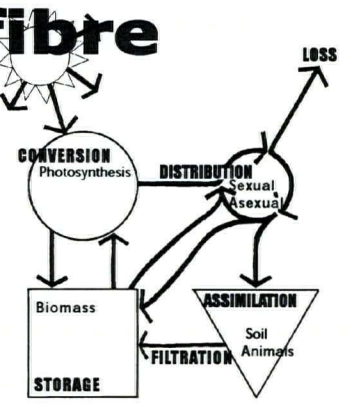
local animal manure

Community forests

wood

firewood

botanicals



The provision of homegrown food is decreasing throughout North America. This can be attributed to the availability of cheap, subsidized food. The average consumer generally does not know the manner of cultivation and distance that food purchased from a grocery store travels to get there. Regenerative communities consider the effects of the current food and fibre economy. Growing ones own food and fibre improves the health of the local and global community. It also has the added benefit of improving local food security.

energy

principle:
Conserve and use energy efficiently.

goals:
Reduce energy consumption.

Minimize or eliminate the use of non-renewable energy sources.

Utilise flexible and redundant energy systems.

Develop locally appropriate renewable energy systems.

physical design strategies:

Passive day-lighting

Passive solar heating

Shade trees

Vegetative wind breaks

Solar panels

On-site storage systems

Fuel cell technology

Thermal massing

Water - thermal storage

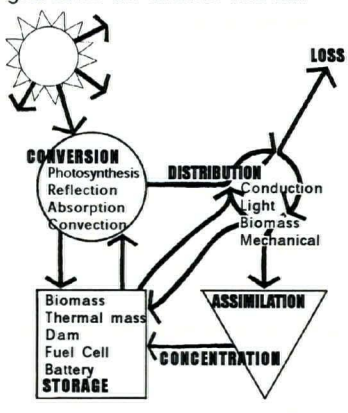
Geothermal

Hydro

Co-generation

Biogas

Heat pumps



Considered to be the primary change agent of ecological systems, energy is generally taken for granted in today's society. However, as the price of non-renewable fuels increases coupled with an expected decrease in their availability it will become necessary to identify and develop alternative sources. Regenerative communities require sources of renewable energy that do not pollute, are available locally, and are affordable and efficient. Renewable energy sources of this nature are generally limited to solar, wind and hydroelectric energy but may include geothermal and biogas sources.



UBC SOUTH CAMPUS FARM

UNIVERSITY OF BRITISH COLUMBIA VANCOUVER, BC

Approach

DRAWING 4

base::design::detail D. MASSELINK 01.2001



ecology DESIGN FRAMEWORK inspiration



"If we are to have an accurate picture of the world, even in its present diseased condition, we must interpose between the unused landscape and the misused landscape a landscape that humans have used well."

WENDELL BERRY

"Knowledge of place - where you are and where you come from - is intertwined with knowledge of who you are. Landscape, in other words, shapes mindscape."

DAVID ORR

definition

ecology *n.* 1. the study of the relationships between living organisms and their environment. 2. the set of relationships of a particular organism with its environment. [from Greek *oikos* house + *-logy* indicating the science or study of, from *logos* the word.]

Ecology implies education - an education that involves the world and seeks to understand the relationships that exist between the living and non-living. A relatively new term, it has acquired another meaning, one that wrongly emphasizes the relationships, which occur outside humanity's influence. Coupled with this evolution in meaning has been a corresponding de-emphasis of its educational focus. Ecology is one of the pillars of my design framework because of its ability to capture the imperatives of understanding (learning) and of appreciating that which we inhabit - a participatory reverence, which I think if fully recognised, is useful.



precedent

The possibility of developing Farm programs that integrate learning with participation and management supports the expanding educational approach of many UBC faculties. I have selected three precedents that embody the principle of ecology as defined in by this design framework. The selected precedents exemplify participatory learning environments where the pursuit of ecological knowledge and appreciation is paramount. All three emphasise the practical; it is through participation that one learns and develops an appreciation for the natural world. The emphasis on participation particularly with the land, as in the UCSC and City Farm examples, enforces an appreciation for our role within the context of nature. As a consequence, this participatory approach reconnects and places its participants within nature while providing practical skills that support theoretical knowledge. Students learn and participate within a framework of application and this participation helps support these three facilities.



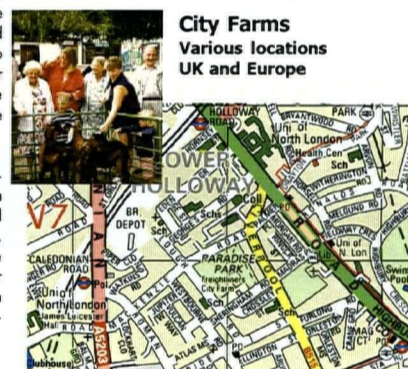
Center for Agroecology and Sustainable Food Systems
UC Santa Cruz, Santa Cruz, CA

The Center for Agroecology and Sustainable Food Systems is a research and education group at the University of California, Santa Cruz. The Center's goal is to research, develop, and advance sustainable food and agricultural systems. The focus of the Center's research and education efforts is to increase understanding of the social, economic, political and ethical foundations of agricultural sustainability; to establish the ecological and agronomic basis for sustainable production systems; and to demonstrate and facilitate the use of information critical to the adoption of these systems.

At the heart of this internationally recognised program are two on-campus facilities: the 25-acre Farm and the four-acre Alan Chadwick Garden. Located at two different sites on the UC Santa Cruz campus, the Farm and Garden serve as the facilities for the Apprenticeship and other activities of the Center for Agroecology and Sustainable Food Systems, which include undergraduate and graduate classes, research, and public tours.

City Farms are environmental and agriculture projects located in urban centres that provide people with the opportunity to learn about the inter-relationship between urban and rural environments, humans and plants and animals, and the important influence of the seasons. At this time the City Farm movement is generally restricted to Europe and Australia.

The city farm movement began in the early 1970's, when initiatives sprang up in parts of Europe aimed at bringing derelict land back into use for the benefit of the local community, and which used farm animals as a central part of their activities. Initial projects started in the Netherlands, which used farm animals for educational purposes and later spread to England where government funding was used to set up the City Farm Advisory Service in 1976. Since then the City Farm movement has enjoyed steady growth with farms becoming established in numerous urban areas across the UK and Europe.



City Farms
Various locations
UK and Europe



Schumacher College
Devon, UK

Located in South Devon, England Schumacher College is an international centre for ecological studies, which explores the foundations of a new paradigm through a program of individual residential courses taught by visionary teachers and more recently a one year MSc. level program in Holistic Science. Those who teach at the College are selected for the significance of their work and their contribution to radical ecological thinking. The College was established in 1991 by the Dartington Hall Trust, a charity committed to innovative educational projects. The foundation of the College rests on the belief that the prevailing worldview which has dominated Western civilisation has serious limitations and that a new vision is required to help human society particularly with its relationship to the Earth.

What is particularly interesting about this precedent is the manner in which its daily affairs support what is being taught in the classroom. The meals are vegetarian and are prepared by the staff and students. Locally grown seasonal organic produce is predominantly used. All students and a number of the staff are housed on site. Everyone is expected to share in the communal tasks of cooking and cleaning.

challenge

Encourage and explore new ways of considering the environment and by doing demonstrate how society might become more active and supportive ecological participants.

approach

1. Provide holistic experiential learning opportunities that reveal and reconnect people with their environment.
2. Establish systems that embody and support the principles of sustainability and health.
3. Reveal the benefits of integrating agroecological systems within communities.
4. Establish extensive local, regional, national and international connections with ecologically orientated institutions.
5. Protect, reveal, enhance and integrate local natural systems within the farm and the surrounding UBC community.
6. Continually look to Nature as model and mentor.



Ecological education - the way of the future - will require the reintegration of experience into education, because experience is an indispensable ingredient of good thinking. One way to do this, for example, is to use the campus as a laboratory for the study of its own food, energy, materials, water and waste flows. Research on the ecological impacts of a specific institution reduces the abstractions of complex issues to manageable dimensions, and does so on a scale that lends itself to finding solutions - an antidote to the despair felt by students who understand problems but are powerless to affect change.

DAVID ORR



UBC SOUTH CAMPUS FARM

UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER, BC

Design Framework

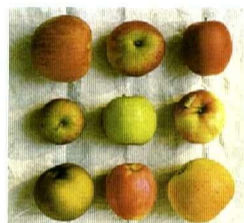
DRAWING 5

base::design::detail D. MASSELINK 01.2001

economy

DESIGN FRAMEWORK

inspiration



"The local community must understand itself finally as a community of interest - a common dependence on a common life and a common ground. And because a community is, by definition, placed, its success cannot be divided from the success of its place, its natural setting and surroundings: its soils, forests, grasslands, plants and animals, water, light, and air. The two economies, the natural and the human, support each other; each is the other's hope of a durable and a liveable life."

WENDELL BERRY



definition

e•con•o•my *n.* 1. careful management of resources to avoid unnecessary expenditure or waste; thrift. 2. a means or instance of this; saving. 3. sparing, restrained, or efficient use, esp. to achieve the maximum effect for the minimum effort. 4. the orderly interplay between the parts of a system or structure: *the economy of nature*. 5. *Archaic.* the management of household affairs; domestic economy. [via Latin from Greek *oikonomia* domestic management, from *oikos* house + *-nomia*, from *nemein* to manage.]

Economy is a useful term to guide the development of this design project as it underscores the importance of careful management - management of resources in a manner that is both restrained and respectful. True economics requires careful measurement, analysis, response, and an informed involvement that if done well considers systems as wholes not parts and looks to the future, working with timeframes that extend beyond conventional 5 or 10-year terms. An economic approach necessitates discipline - a discipline concerned with the future health and viability of the community.



precedent

I have selected three precedents that support an "extended" interpretation of economy. All three are managed in a way that generates the revenue necessary for their continued existence. But what is different is that by-and-large their management is restricted by a set of principles that place health, education and leadership above their need to generate revenue. Conventional economic interests take a backseat to their principles and their beliefs. And it is this belief that permeates everything that they do. It creates and affects, in the words of Wendell Berry, their "household" economies.

These precedents in their own way have interpreted what it means to be an economist in the 21st Century. And their interpretations, though different are quite compelling. The Center for Urban Agriculture provides an outstanding example of how a working farm can prove otherwise and survive and thrive within a suburban neighbourhood. Landsake counters the "tragedy of the commons" and The John Lyle Center is a living classroom for the challenges of this Century.



Center for Urban Agriculture
Fairview Gardens, Goleta, CA

The Center for Urban Agriculture is a non-profit organisation, established in 1997 to preserve and operate the historic Fairview Gardens Farm. The farm's 5.7 ha produce over a hundred different fruits and vegetables distributed through a subscription farming program, on-farm produce stand, wholesale and specialty restaurant sales and attendance at local farmers markets. The farm feeds approximately 500 families, and employs over 20 people. Additional funding is required to support the farm's cultural programs, which include festivals, workshops, tours, lectures, cooking and gardening classes, on-farm apprenticeships, and nation-wide school and community outreach and consultation. The Center's mission is to demonstrate the economic viability of sustainable agricultural methods for small farm operations; research and interpret the connections between food, land and community well being; and nurture the human spirit through on and off farm educational programs and public outreach.

Fairview Gardens is an example of the potential that small integral urban farms and gardens hold for urban communities. With community support the Center convinced the farm's owners and city officials that the highest best use for the farm was not housing but to grow food. The Center accomplished this through the development of on-farm programs that revealed how agriculture can nourish the spirit as well as the body, and how the farm had become an important place of interest and beauty in an increasingly banal and ecologically barren community.

Land's Sake is a non-profit organisation in Weston, Massachusetts that is responsible for managing most of the town's 910 ha of conservation land. Besides growing organic fruits, flowers and vegetables, Land's Sake harvests firewood and timber from the town's extensive community forest, collects and makes syrup and cider from the town's sugar maple and apple trees and runs a variety of environmental education programs. The organisation employs a full-time staff of three, along with dozens of young people of various ages and education, and a few volunteers

Land's Sake was established in 1980 to provide a secure institutional home dedicated to the caring of community land while providing employment and educational opportunities for local young people. Land's Sake's non-profit status has allowed for direct contracting with the Weston Conservation Commission to care for community land, free of the limitations imposed on municipal agencies. Their non-profit status has also allowed them to work and care for private land - a flexible arrangement that helps to establish connections between public and private lands.



Land's Sake Community Farm
Weston, MA



John T. Lyle Center for Regenerative Studies
Cal Poly University, Pomona, CA

The John T. Lyle Center for Regenerative Studies (The Lyle Center) is an interdisciplinary university-based setting for education, demonstration and research in regenerative and sustainable systems. Students from any discipline at the Cal Poly campus can participate in courses. Currently, a community of 20 students resides on the site working with regenerative systems as part of their daily lives. The Center was originally designed to accommodate a total of 100 student residents.

The comprehensive design of the 7.3 ha facility provides a living environment for faculty, students and visitors to study passive solar designed buildings, renewable energy capture, water recycling, nutrient cycling, food growing systems, aquaculture, native habitat and human communities.

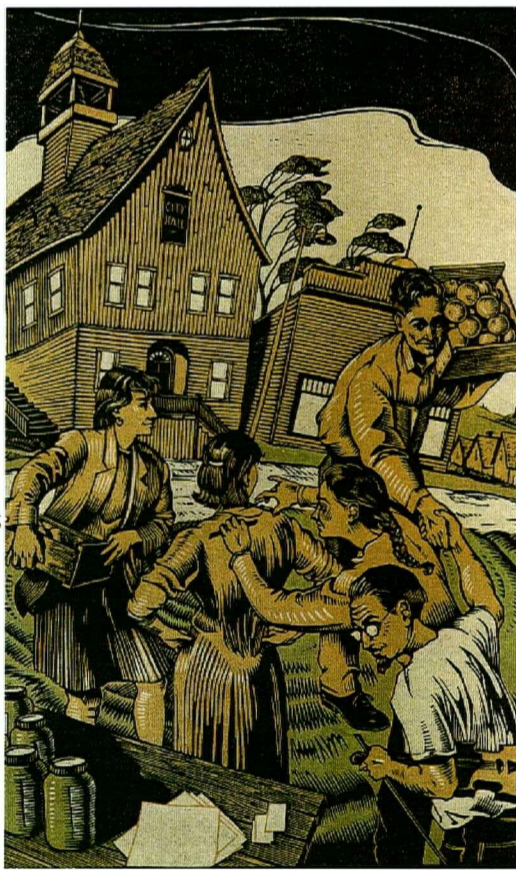
The Lyle Center is dedicated to the education, demonstration and research of sustainable systems and technologies. These three objectives are interdependent and all contribute to the projects underway at the Center. These projects include alternative energy production, integrated waste management, natural area preservation, human and social systems, built form, aquaculture, and sustainable food production.

challenge

To conduct our affairs with humility in a manner that supports the true definition of economy - the careful management of resources in a way that maximizes health and benefits for all.

approach

1. Develop and use local, non-polluting, renewable energy sources.
2. Build-in accountability. Use full lifecycle or ecological accounting methods to guide decision making.
3. Close nutrient and energy loops, enhance feedback mechanisms and support and encourage system redundancies.
4. Strive to support the health and longevity of all system elements.
5. Support local needs first.
6. Maximize synergistic connections and relationships.
7. Utilize consensus decision-making management methods.



What we have before us, if we want our communities to survive, is the building of an adversary economy, a system of local or community economies within and to protect against the would-be global economy. To do this, we must somehow learn to reverse the flow of the siphon that has for so long been drawing resources, money, talent and people out of our countryside with very little if any return... We must figure out new ways to fund, at affordable rates, the development of healthy local economies. We must find ways to suggest economically - for finally no other suggestion will be effective - that the work, the talents and the interest of our young people are needed at home.

WENDELL BERRY



UBC SOUTH CAMPUS FARM

UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER, BC

Design Framework

DRAWING 6

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DESIGN FRAMEWORK

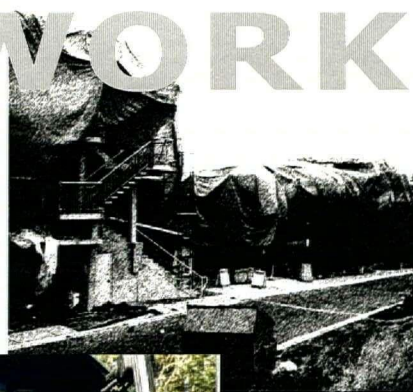
integrity

inspiration



"A place is not a place until people have been born into it, have grown up in it, lived in it, know it, died in it - have both experienced and shaped it, as individuals, families, neighbourhoods, and communities, over more than one generation. Some are born in their place, some find it, some realise after long searching that the place they left is the one they have been searching for. But whatever their relation to it, it is made a place by slow accrual, like a coral reef."

WALLACE STEGNER

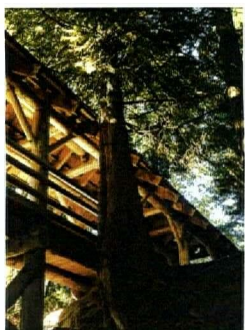


definition

in-teg-ri-ty *n.* 1. adherence to moral principles; **honesty**. 2. the quality of unimpaired; **soundness**. 3. **unity**; **wholeness**. [from Latin *integritas*.]

More often than not I associate integrity with those that transcend the human condition through their words and deeds. As a consequence I think of individuals, single profound individuals who by the manner in which they conduct their lives improve the connectivity of the human race. The lives of these individuals expose the possibilities of the human race and reconnect us to that which is true. I believe that we can get this same inspiration from the environment around us but often it is much more difficult for us to see. The discipline of ecology is helping to address this difficulty.

Gandhi taught, "Be the change you want to see in the world." To behave, to act out, to live that which you believe is true is integrity made manifest. I have included integrity in the design framework because I think it is important to consider the connectivity of our designs - how they re-connect us with the natural world, with the spiritual realm, with other people and communities of people, and with ourselves. Integrity implies health so these connections would be an improvement on current conditions.



precedent

The opportunity to develop farm programs at UBC that demonstrate integrity and leadership is an exciting possibility. Imagine on-campus farm programs that support the increasing commitment to sustainability and health - what currently is taught in the classroom, written about in articles or delivered in speeches can now be done locally, demonstrated and revealed. We can now practice what we preach.

I have selected three precedents that embody the definition of integrity. Each speak to the commitment that their respective communities have for "walking the talk" - the Adam J. Lewis Center for Ecological Studies to living education, Village homes to ecological community living, and Beech Hill Farm to integrated educational organic farming. Each precedent suggests possibilities for improving the manner in which we exist on this planet. The manner in which this is done is hopeful, exciting and exemplary. Each one is interesting, informative, and beautiful. They are living, tangible examples of what ecological living can be like.



The Adam J. Lewis Center for Environmental Studies
Oberlin College, Oberlin, OH



The Adam Joseph Lewis Environmental Studies Center, opened in early 2000, is designed to serve as a living laboratory and model of sustainable architecture. It was designed to give all Oberlin students and faculty and the larger community the opportunity to work in and with a building that represents the most advanced knowledge and practice in sustainable design. Students and faculty were also involved in the planning and design of this building and many more will be involved in modifying and enhancing the technologies and design strategies they find there. The idea is to provide a facility that supports the investigation and learning required for reducing the human footprint on the earth.

Although the Environmental Studies Center sits within a college campus, it's exemplary qualities in the area of sustainable design and education will undoubtedly have a great influence on the international community. The Center is a tremendous example of the prestige, influence and energy that a new and innovative sustainable development can create. Through its very existence the Adam Joseph Lewis Environmental Studies Center challenges students and society to become active builders of sustainable community.

Village Homes is a 27 ha, 242-unit mixed-use residential development located on the outskirts of Davis, California. Initiated in the early 1970's by local graduate students in an effort to create a local sustainable residential development that embodied the ideals of the garden city. In spite of numerous roadblocks Michael and Judy Corbett, the eventual designers and developers of this project, were able to realise the creation of this project, which remains a leading international example of sustainable residential development.

Village Homes includes a number of innovative features. The community is structured to maximise solar orientation allowing for the possibility of solar heating and energy production. Agriculture is integrated within the community with 7.5 ha set aside for cultivation. A variety of home types and sizes accommodate a variety of family incomes, sizes and types. Reduced street widths, the elimination of thru-streets and the inclusion of backyard travel corridors and common areas add to the feeling of community. A central drainage system that includes swales, creeks and ponds takes care of runoff. Community facilities include childcare, a swimming pool, restaurant and business centre.



Village Homes
Davis, CA



Beech Hill Farm
College of the Atlantic
Bar Harbour, ME

College of the Atlantic's Beech Hill Farm is located off-campus and includes approximately 2 ha of diversified, certified organic farmland, several acres of heirloom apple trees, 30 ha of managed forest land, a barn, farmhouse, farmstand, outbuildings, and greenhouses. The farm was donated to the College by alumni in May of 1999. It has become an integral and highly valued facility of the College. COA is currently in the process of using this facility to preserve working local farmland and create a hands-on educational resource for students, farmers, and community members.

COA is committed to managing the Beech Hill Farm as a working, sustainable organic farm that provides fresh produce for the campus cafeteria and continues to serve local customers through wholesale accounts and a retail farmstand. The College's students, staff, faculty, and farm managers work collaboratively to meet the farm's threefold goal of demonstrating local and sustainable food production, and good land management and providing applied education opportunities.

challenge

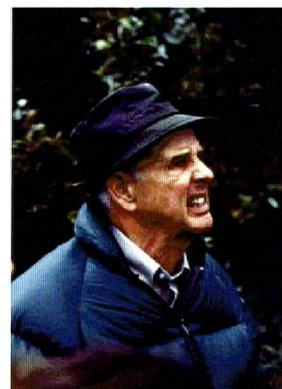
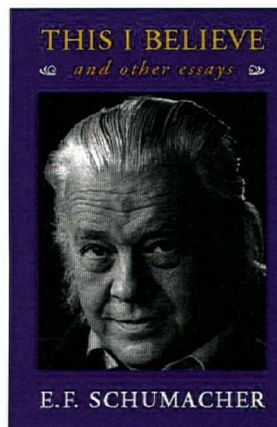
To support the creation of an integral community that connects body and spirit to the land, the University, Vancouver and beyond.

approach

1. Demonstrate respect and humility in the use of Creation.
2. Design with nature in a manner that supports or improves health and well-being.
3. Reveal and explore the benefits of integrating agroecological systems within communities.
4. Establish and maintain local, regional, national, and international connections with ecologically orientated institutions.
5. Look to nature as model and mentor.
6. Demonstrate and support beneficial leadership in the area of agroecology and integral systems design.

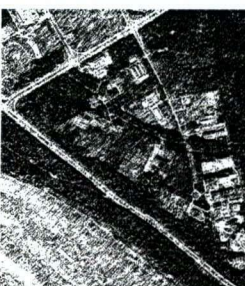
... we can, each of us, work to put our own inner house in order. The guidance needed for this work cannot be found in science or technology, the value of which utterly depends on the ends they serve; but it can still be found in the traditional wisdom of mankind.

E.F. SCHUMACHER



...I aspire downward. Flyers embrace the air, and I'm a man who needs something to hug. All my dawns cross the horizon and rise from underfoot. What I stand for is what I stand on.

WENDELL BERRY from "Below"



UBC SOUTH CAMPUS FARM

UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER, BC

Design Framework

DRAWING 7

base::design::detail D. MASSELINK 01.2001

DESIGN FRAMEWORK

beauty inspiration

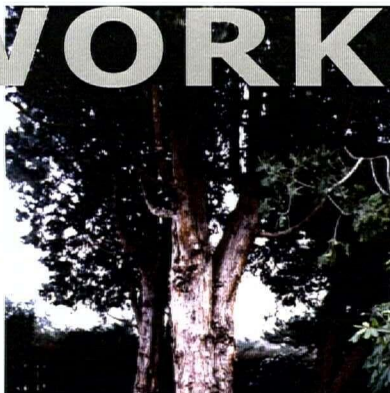


"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."

ALDO LEOPOLD, 1968

"We can say that man's management of the land must be primarily orientated towards three goals - health, beauty and permanence."

FRITZ SCHUMACHER, 1973



definition

beau+ty *n. +ties*. 1. the combination of all the qualities of a person or thing that delight the senses and please the mind. 2. *Informal*. an outstanding example of its kind. 3. *Informal*. an advantageous feature. [from old French *biauté*, from *biau* beautiful.]



If this definition is extended and applied in the manner suggested by the preceding quotes, beauty is the consequence of getting a number of things right. If we are able to instill the principles of ecology, economy and integrity, as defined in this framework, then we have good chance of supporting the development and presence of beauty. Beauty suggests the presence of something greater - an approach that is concerned with and considerate of the everyday - an approach that celebrates and respects the presence of the creative spirit. In short beauty is the pure expression of the engagement between the land and all that it supports.



precedent

Beauty is an element that is often forgotten or negated by today's society. Beauty has become equated with superficiality - with surface. Like economy, a lot has been lost in this redefinition. I believe that beauty or true beauty suggests depth and is the sum expression of the nature and integrity of one's actions. It is the harmonious summation of applied ecological, economic and integral design principles. It is the Holy Grail. If we get these right it may be beautiful. I believe that all of the previous precedents support this. I have selected another three that express this element most clearly and uniquely.

Highgrove Estate is a living testament of an individual's commitment to principles. The strength of his character is revealed throughout his property. The Solar Living Centre is a business enterprise that challenges the economic norm by remaining true to the principles of its founders. It demonstrates ecological leadership that engages the mind, pleases the senses, and generates income. Pilchuck Glass School provides an outstanding example of the synergistic possibilities of applied creativity, aesthetics and landscape.



Highgrove Estate
Tetbury, UK

Purchased in 1980 by HRM Charles, the Prince of Wales, Highgrove Estate has evolved into what many leading experts believe is the most important garden/farm estate to be developed in Britain in recent times. The Prince began actively farming the property in 1985 with the intention of developing it as a Home Farm (demonstration farm) for local farmers. In 1987 he began the process of converting the farm to organic practices. Within ten years the entire farm, which had grown to include 772 ha, was being cultivated organically.

The Prince, guided by a sense of responsibility, has used Highgrove to successfully demonstrate that sustainable agriculture operations can benefit from an attention to aesthetics. He currently uses his appreciation for beauty to reveal and expand on the more utilitarian aspects of the farm. For example, the farm's sewage is treated using reed bed technology, a method that doesn't harm the environment and adds to the beauty of the landscape through the creation of a wetland environment. This is but one example of the care and attention that the Prince has given to his property. In doing so he is demonstrating the expanded possibilities that consideration and incorporation of aesthetics might bring to farm operations.

The Real Goods Solar Living Center is an example of a business that has successfully expressed its interest in sustainability through the design and management of its commercial buildings and landscape.

The Real Goods Company began over twenty years ago in California as a small chain of retail outlets selling solar panels and other green goods. Since that time it has evolved into a multimillion-dollar business that does most of its business via the mail and internet selling everything from composting toilets to entire energy systems. In 1993 Real Goods embarked on an ambitious mission that would see it, in the words of its founder John Schaeffer, "walk its talk." The outcome was the development of a central facility that embodies and demonstrates Real Goods holistic approach to sustainability.

The facility located on a former industrial dump site in Hopland, CA houses a showroom and distribution warehouse for the "real goods" but also includes extensive onsite demonstrations of sustainability such as the treatment of wastes, responsible re/use of water, the production of food, the creation of wildlife habitat, and the capture and use of local wind and sun energy. The facility and its surrounding landscape successfully embodies and demonstrates the beliefs and principles of the company while acting as a working showroom.

Real Goods Solar Living Center
Hopland, CA



Pilchuck Glass School
Stanwood, WA

The Pilchuck Glass School located on Victoria Hill in the Victoria community of Stanwood, approximately two hours south of Vancouver, was founded in 1971 by the internationally renowned glass artist Dale Chihuly. The school was established incrementally over the next three decades over the 25 ha of the Pilchuck Tree Farm generously donated by Anne and John Hauberg. Since its auspicious beginning Pilchuck has broadened the scope of glass blowing and the contemporary interest in glass as a visual arts medium, provided a catalytic environment for leading visual artists and served as a model of education in the visual arts.

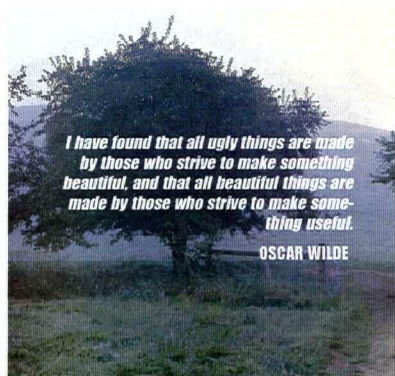
What is unique to this precedent is the manner in which it evolved to become one of the leading seasonal visual arts schools and how its incremental evolution affected the design and construction of the campus. The structure is very organic and responds wonderfully to both itself and the landscape. Beauty and creativity permeate every aspect of the school; from what is being taught inside the studio, to how glass is made, and the effect of its use. Pilchuck provides a strong example of how culturally informed practices can enhance the experiential life and meaning of a community.

challenge

To fuse and transform the ecological, economic and integral framework in a way that catches the eye, inspires the mind, and touches the heart - ultimately to demonstrate hope in action.

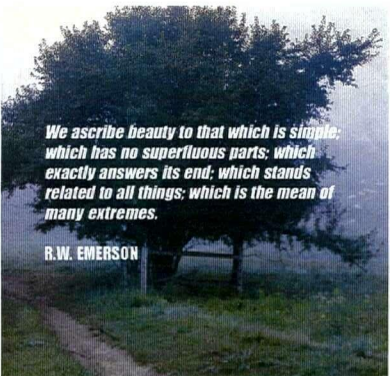
approach

1. Create no ugliness here or anywhere.
2. Demonstrate and express the deeper meaning of quality, care, respect and attention.
3. Reveal the beauty of the everyday through the careful application of attention.
4. Investigate and promote the development of a sustainable aesthetic.
5. Reveal and respect the genus loci as broadly and as intimately as is possible.



I have found that all ugly things are made by those who strive to make something beautiful, and that all beautiful things are made by those who strive to make something useful.

OSCAR WILDE



We ascribe beauty to that which is simple; which has no superfluous parts; which exactly answers its end; which stands related to all things; which is the mean of many extremes.

R.W. EMERSON

I am convinced there's more to beauty than biology, more than cultural convention. It flows around and through us in such abundance, and in such myriad forms, as to exceed by a wide margin any mere evolutionary need. Which is not to say that beauty has nothing to do with survival. I think it has everything to do with survival. Beauty feeds us from the same source that created us. It reminds us of the shaping power that reaches through the flower stem and through our own hands. It restores our faith in the generosity of nature. By giving us a taste of the kinship between our own small minds and the great Mind of the Cosmos, beauty reassures us that we are exactly and wonderfully made for life on this glorious planet. In this magnificent universe, I find in that affinity a profound source of meaning and hope. A universe so prodigal of beauty may actually need us to notice and respond, may need our sharp eyes and brimming hearts and teeming minds. In order to close the circuit of Creation.

SCOTT RUSSELL SANDERS



UBC SOUTH CAMPUS FARM

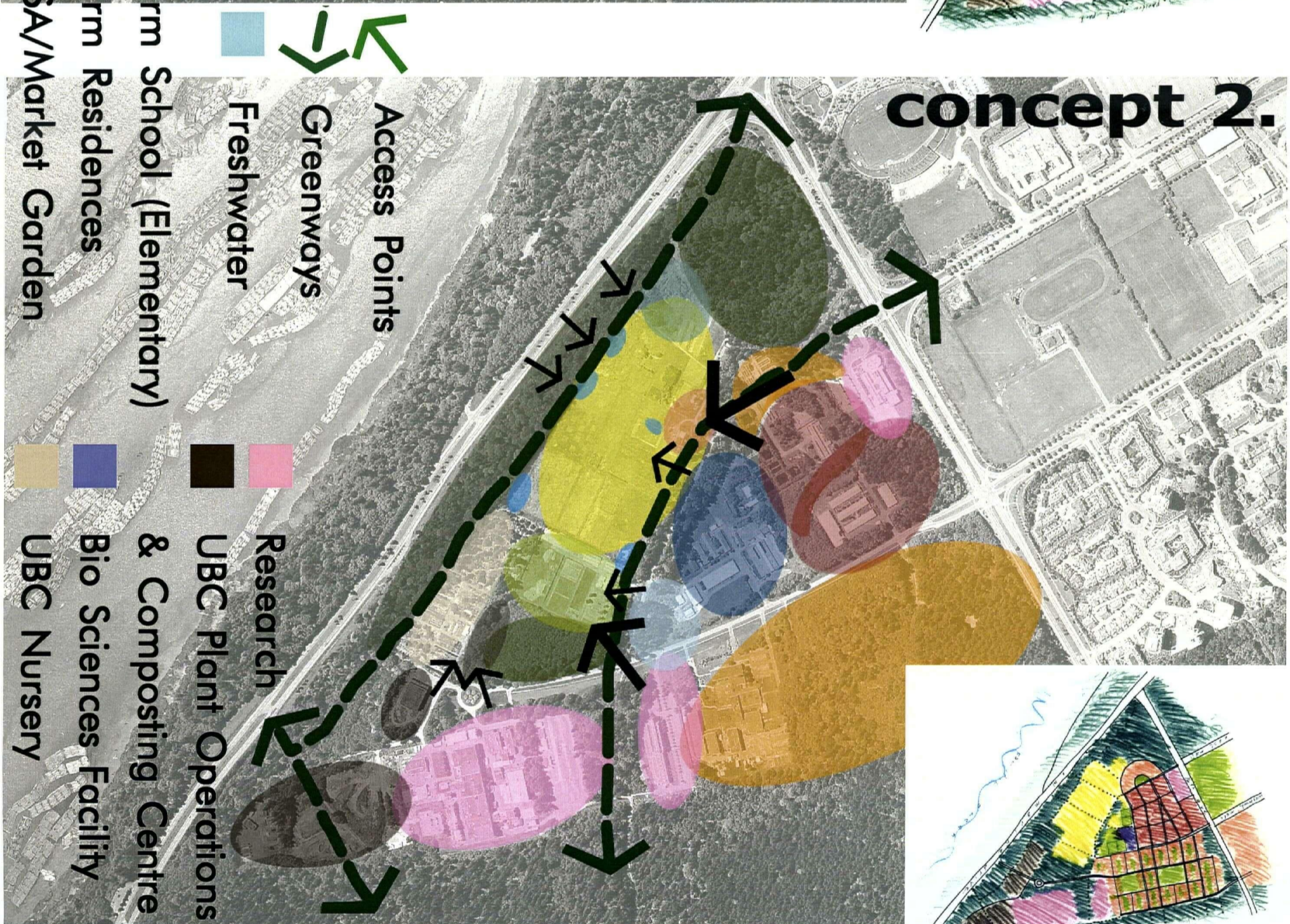
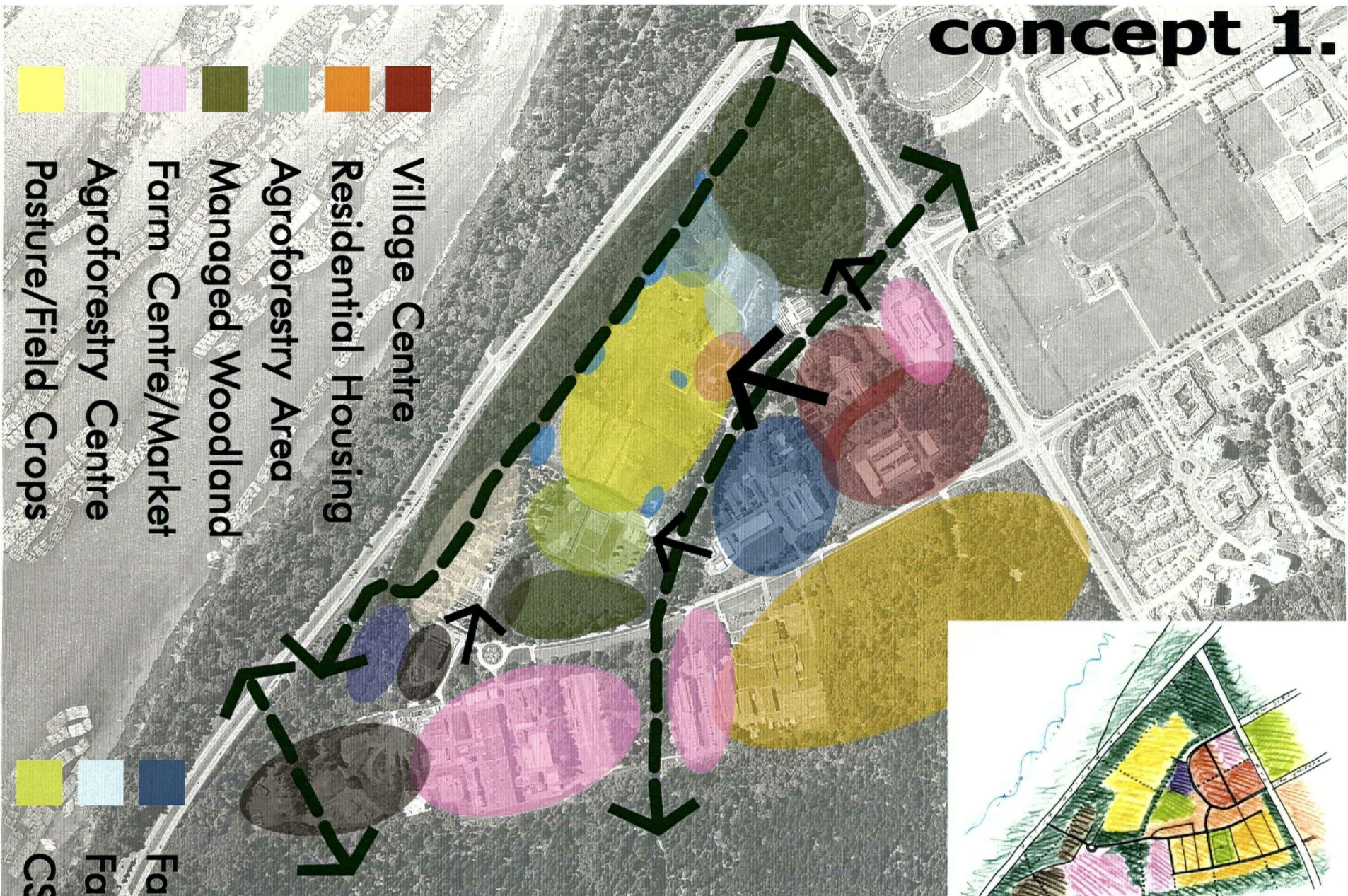
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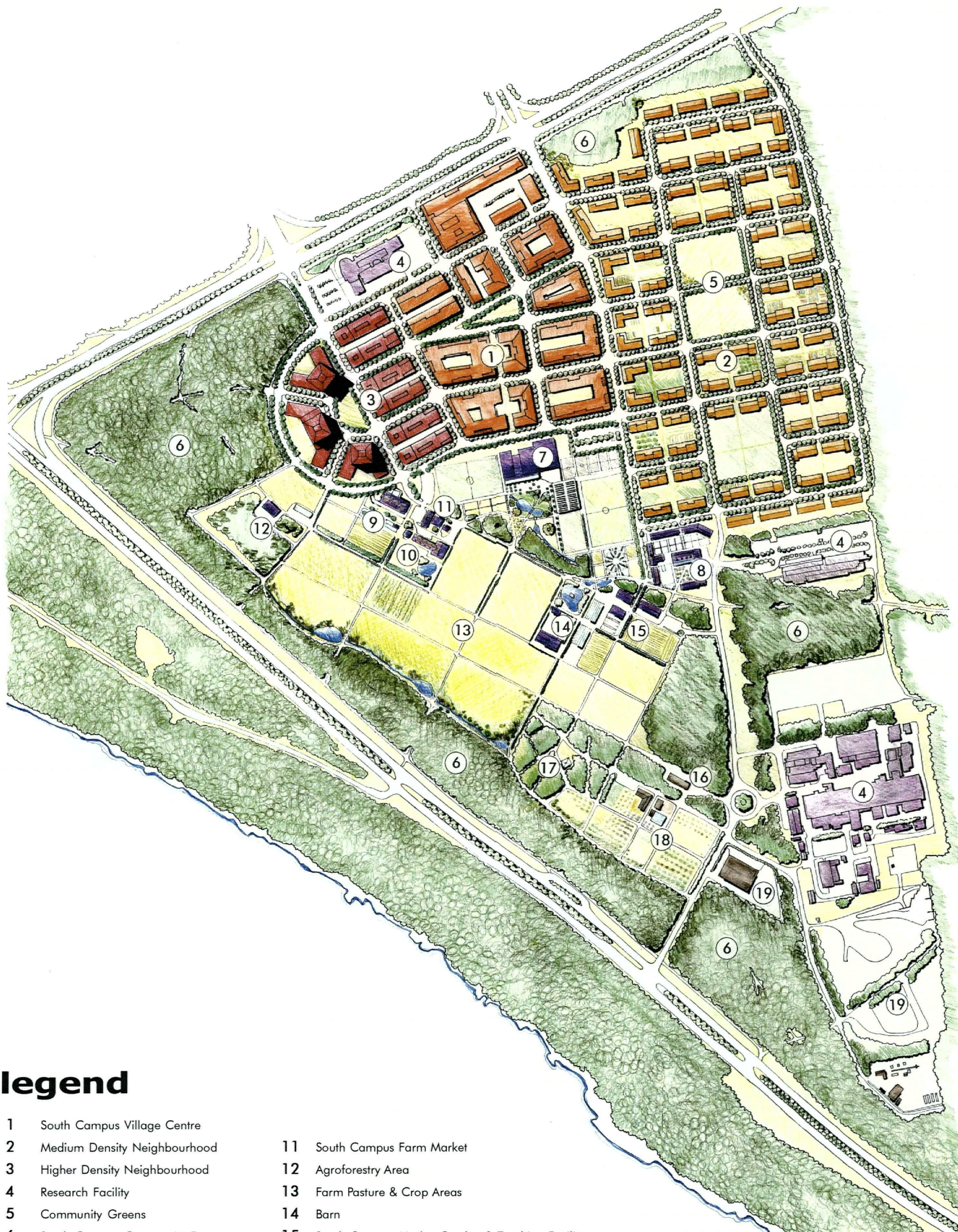
VANCOUVER, BC

Design Framework

DRAWING 8

base::design::detail D. MASSELINK 01.2001





legend

- | | |
|---------------------------------|---|
| 1 South Campus Village Centre | 11 South Campus Farm Market |
| 2 Medium Density Neighbourhood | 12 Agroforestry Area |
| 3 Higher Density Neighbourhood | 13 Farm Pasture & Crop Areas |
| 4 Research Facility | 14 Barn |
| 5 Community Greens | 15 South Campus Market Garden & Teaching Facility |
| 6 South Campus Community Forest | 16 South Campus Composting Facility |
| 7 Farm School | 17 South Campus Arboretum & Interfaith Chapel |
| 8 Farm Residential College | 18 UBC South Campus Nursery |
| 9 South Campus Community Centre | 19 University Services |
| 10 UBC Farm Centre | |



UBC SOUTH CAMPUS FARM

UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER, BC

South Campus Plan

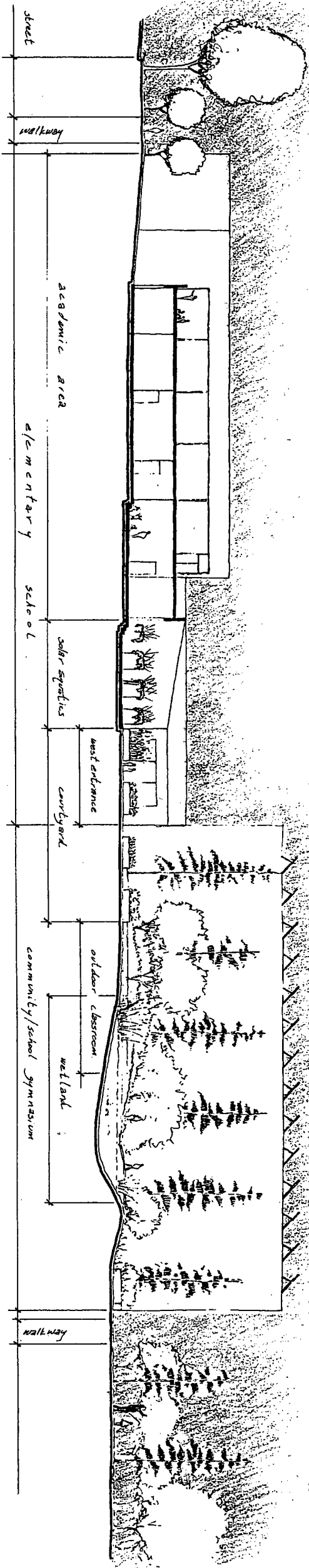
DRAWING 10

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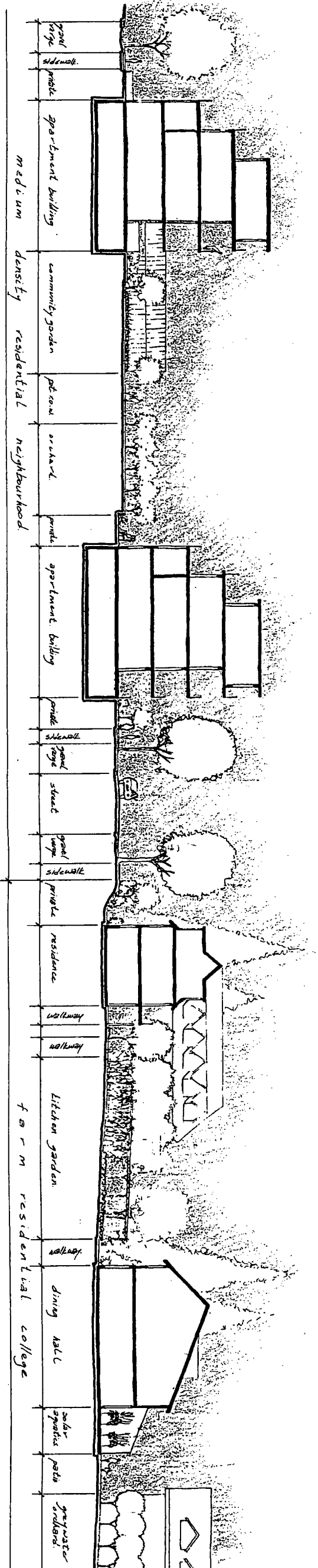
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UBC SOUTH CAMPUS FARM
UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER, BC
DRAWING 11
D. MASSEMAN 01/2007



cross section of farm school (EAST FACING)



cross section of residential area & farm college (EAST FACING)



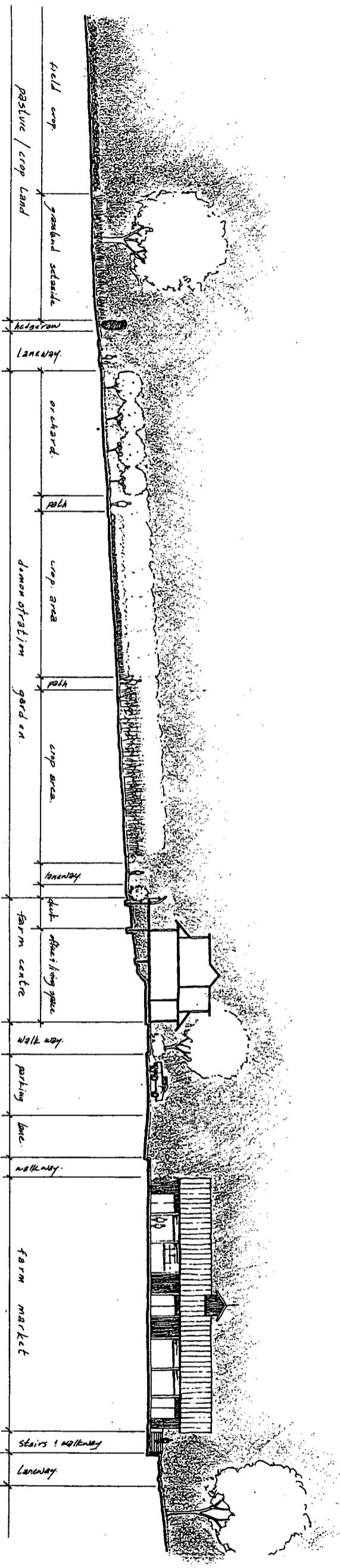
UBC SOUTH CAMPUS FARM

UNIVERSITY OF BRITISH COLUMBIA

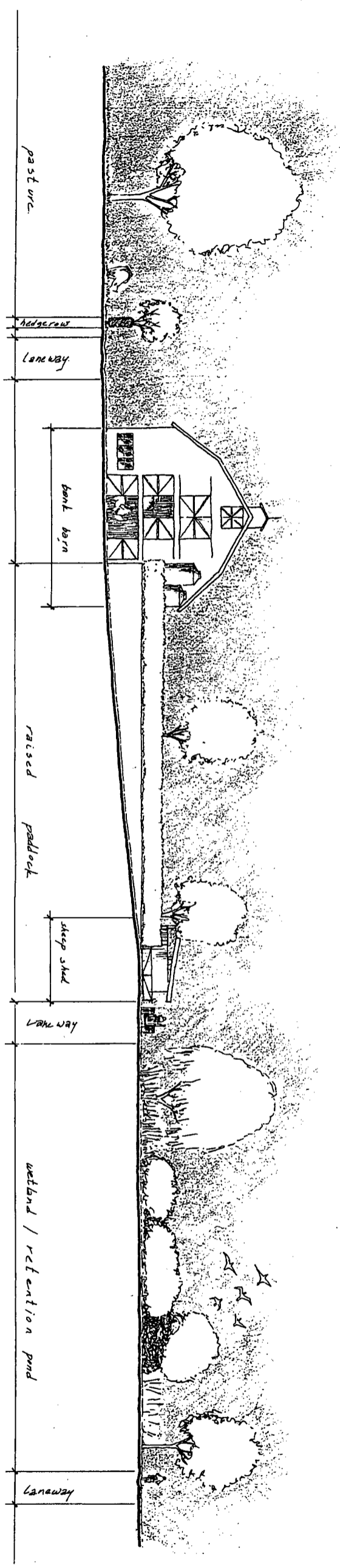
VANCOUVER, BC

Community Cross Sections

DRAWING 12
D. MASSELINK 01.2001

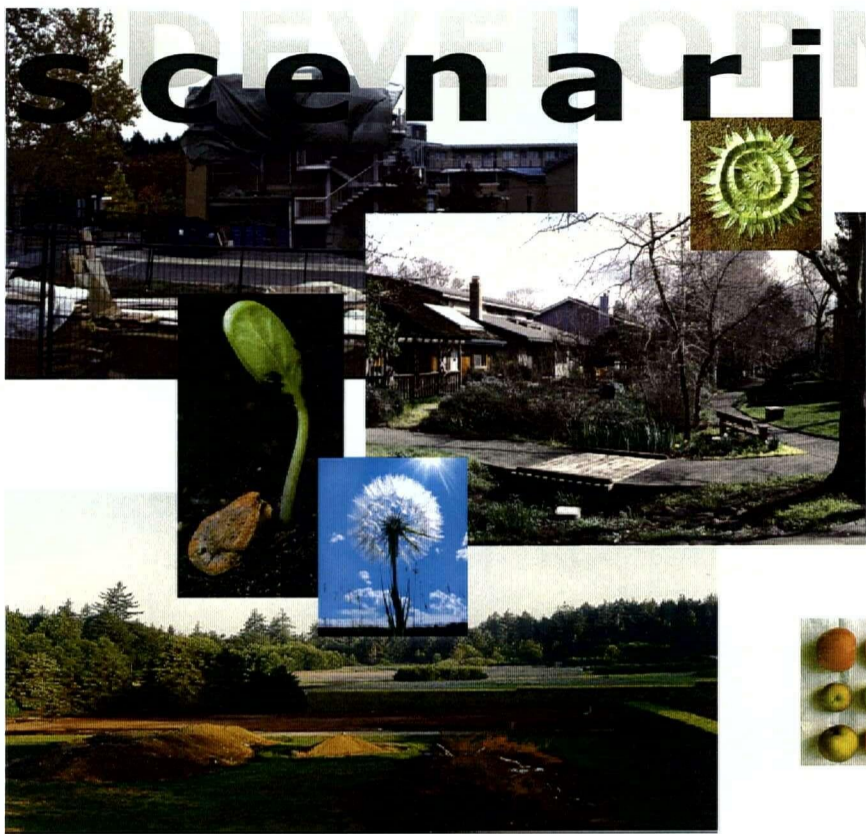


cross section of farm centre
(WEST FACING)



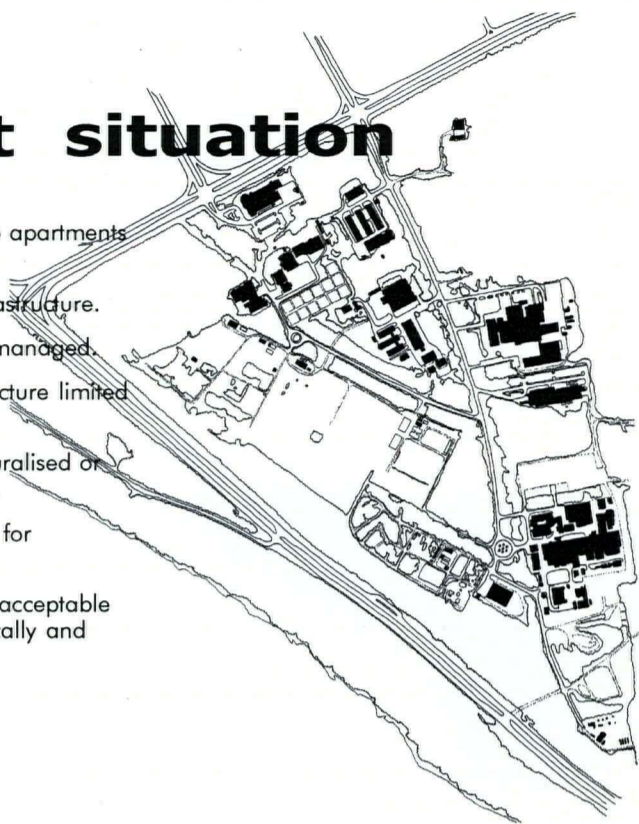
cross section of barnyard
(WEST FACING)

DEVELOPMENT scenarios

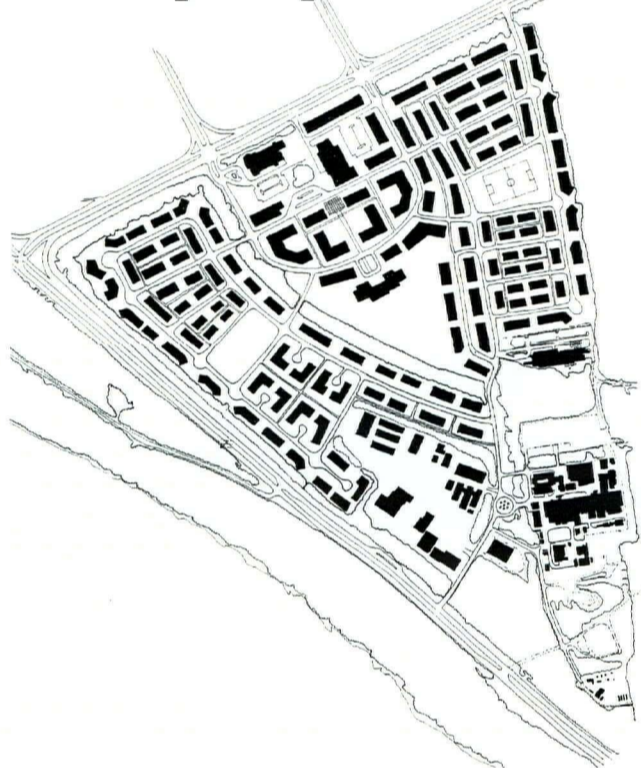


current situation

- Housing limited to two apartments (pop. 5).
- Aging & unkempt infrastructure.
- Poorly appreciated & managed.
- Minimal built infrastructure limited to >50% of site.
- ~50% of site in a naturalised or naturalising condition.
- ~90% of site reserved for research.
- Current situation is unacceptable ecologically, economically and socially.

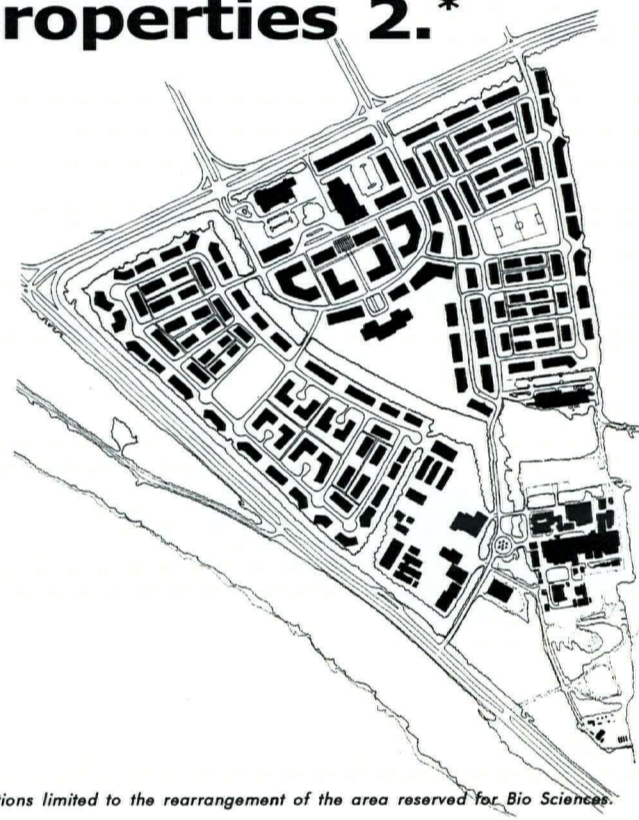


ubc properties 1.*



- Housing maximized (final pop. of 5000).
- High density town centre with lower density residential areas.
- Elementary school heart of community.
- Bio Sciences facilities restricted to 11 ha (from ~60 ha).
- Built infrastructure maximised to >75% of site.
- Naturalized vegetation and habitats almost entirely removed.
- <20% of site retained for research.
- Supports the interests of UBC Properties at the expense of potential land-based teaching and research opportunities.

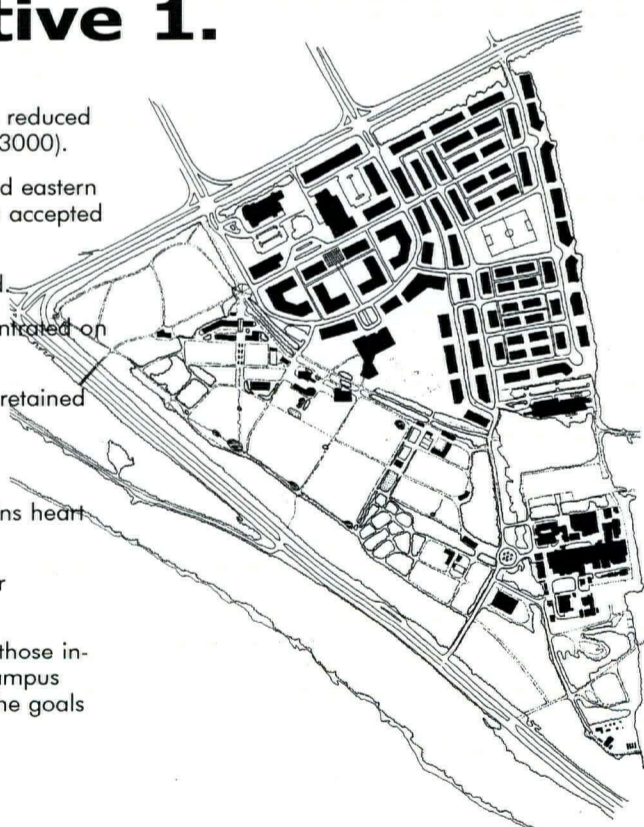
ubc properties 2.*



* Difference between options limited to the rearrangement of the area reserved for Bio Sciences.

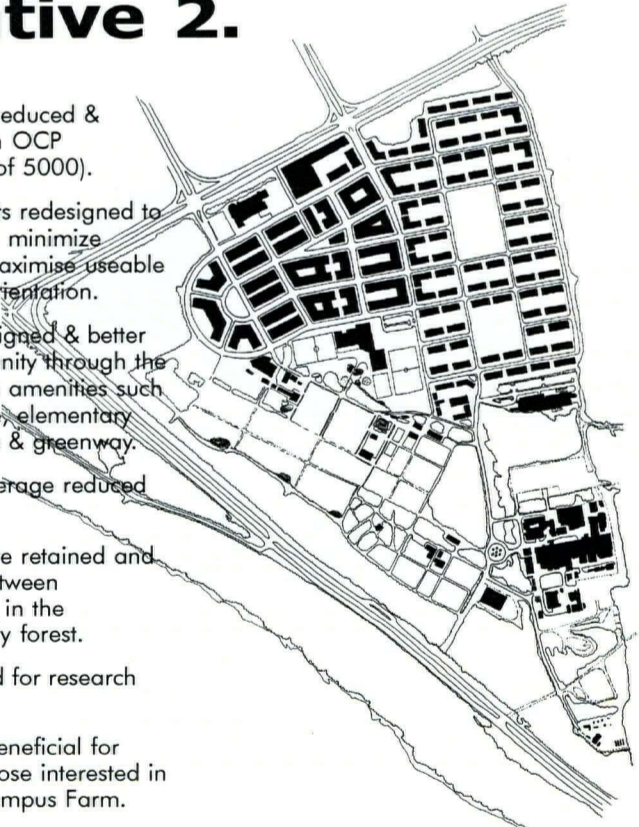
alternative 1.

- Residential housing area reduced (accommodates pop. of 3000).
- Proposed town centre and eastern residential developments accepted as is.
- South farm area retained.
- Built infrastructure concentrated on ~50% of site.
- Ecological infrastructure retained on farm.
- 80+ residents on farm.
- Elementary school remains heart of community.
- ~60% of site retained for research.
- Supports the interests of those involved with the South Campus Farm at the expense of the goals of UBC Properties.



alternative 2.

- Residential land area reduced & densities altered within OCP guidelines (final pop. of 5000).
- Proposed developments redesigned to accommodate density, minimize impervious cover, & maximise useable green space & solar orientation.
- South farm area redesigned & better integrated into community through the placement of common amenities such as a community centre, elementary school, farm residence & greenway.
- Built infrastructure coverage reduced to <50% of site.
- Ecological infrastructure retained and enhanced on farm, between residential buildings & in the surrounding community forest.
- >60% of area retained for research purposes.
- Proposal is mutually beneficial for UBC Properties and those interested in retaining the South Campus Farm.



UBC SOUTH CAMPUS FARM
UNIVERSITY OF BRITISH COLUMBIA VANCOUVER, BC
Comparative Outcomes
DRAWING 14
base::design::detail D. MASSELINK 01.2001

APPENDIX 2 - SUMMARY OF CURRENT FARM USES AND USERS

For the purposes of analysis it is easiest to describe the activities currently occurring on the South Campus Farm site (which includes bioscience facilities) by systematically describing the uses and users associated with each of its component parts. The following provides a general description of each facility along with the associated land holdings.

ANIMAL CARE CENTRE/ZOOLOGY - 4.5 HA (10 ACRES)

This facility is located at the north end of South Campus Road. The UBC Animal Care Program and the Department of Zoology share the management and operation of this facility. Within the facility are:

- Breeding colonies for disease-free rats and mice;
- Housing for a wide range of animals;
- Surgical and radiology facilities;
- Laboratory diagnostic facilities; and
- Dive tanks and fish ponds.

Access to this facility is restricted for disease and security reasons. A chain link fence topped with barbwire encloses this facility.

ANIMAL SCIENCE TEACHING AND RESEARCH COMPLEX

Large Animal/ Aquaculture Centre - 5.7 ha (14 acres)

This Agricultural Sciences facility is located south of 16th Ave. on Wesbrook Mall. This facility currently includes:

- Three barns, which house approx. 170 sheep (bred mainly for medical research);
- One vacant barn for beef cattle;
- A physiology laboratory;
- A small aquaculture operation currently housed in a former swine facility;
- Three small paddock areas and an open field;
- A vacant wildlife facility; and
- A dairy facility complete with administrative offices, staff facilities, two apartments and an embryology laboratory.

With the exception of the sheep barns the facility is largely under-utilized and in need of repair. Due to Plant Operation cutbacks it does not receive the maintenance attention that it requires. In addition this facility is totally dependent on outside inputs of feed and energy and therefore does not currently support the sustainability interests of the Faculty of Agricultural Sciences.

A chain link fence topped with barbwire encloses this facility. A path connects this facility to the Avian Research Centre. There is also a gated driveway onto South Campus Rd.

Avian Research Centre - 3.2 ha (7 acres)

This Agricultural Sciences facility is located adjacent to the previously described facility on Wesbrook Mall. This facility built in the early 1980's currently includes:

- The Quail Genetic Resource Centre which houses the world's largest collection of genetic strains of quail and provides birds for basic and biomedical research;
- The Poultry Unit, which consists of four buildings that house administrative and faculty/student offices, a large classroom, multi-purpose experimental animal rooms, feed mixing facilities, laboratories, large scale broiler and layer rooms and numerous small animal research rooms for studies in animal physiology, behaviour and metabolism;
- Extensively paved grounds; and
- A large stand of alder is growing in the unused space between the Animal and Avian facilities.

With the exception of the Quail Research centre this facility is also largely under-utilized. Due to Plant Operation cutbacks it does not receive the maintenance attention that it requires. In addition this facility is totally dependent on outside inputs of feed and energy and therefore does not currently support the sustainability interests of the Faculty of Agricultural Sciences. A chain link fence topped with barbwire encloses this facility.

SOUTH CAMPUS FIELD

This area includes the Botanical Garden, Botany, Forestry, and Plant Science areas. The topography gradually slopes to the south providing good drainage and solar orientation. A chain link fence topped with barbwire encloses this area. It is penetrated in three locations, all of which are gated.

Botanical Gardens Nursery - 2.7 ha (6 acres)

This area is located at the southwest end of South Campus Field. This facility is mainly used to test and propagate UBC cultivars for introduction into 42 commercial BC nurseries. The facility's greenhouses are also used for other experimental plant research not necessarily associated with the Botanical Gardens. The nursery's facilities include:

- Two glasshouses with an associated potting shed;
- Two polyhouses and a small lath house;
- A 1 ha of field - largely unused, extensively drained and amended;
- The facility is surrounded by large, well-tended hedges to shield the field area from cooling winds; and
- A large pile of soil piled at the southern portion of this site (apparently by from a past realignment of 16th Ave.).

Botanical Gardens Forest - 8.2 ha (18 acres)

An unused mature second growth forest located at the corner of 16th Ave. and SW Marine Drive. On paper this area is managed by the UBC Botanical Gardens, however, in practice it receives little or no attention from any department.

Botany - 4.1 ha (9 acres)

The UBC Botany Department manages a portion of the South Campus Field located on the south side of South Campus Rd. This field area currently includes:

- Two small greenhouses (polytunnel/glass) housing wasabi plants;
- Numerous abandoned tree plots;
- An old portable and unused apiary shed;
- A very small horticulture plot (25m²) for teaching purposes; and

- A small wetland area (wettest area found in the South Campus Field).

Forestry - 3.6 ha (8 acres)

The UBC Faculty of Forestry manages the northern portion of the South Campus Field located on the south side of South Campus Rd. This field and forested area includes:

- One glass greenhouse (in use) and a well built field house;
- One very old unsalvageable portable;
- A small arboretum planted and maintained by Dr. John Worrall;
- A large cleared and partially paved area for polytunnel greenhouses (gas, water and hydro hook-ups still present) - currently used for propagating native plant seedlings; and
- Various maturing tree plots.

Plant Science - 11.7 ha (25 acres)

Approximately 8 ha is in grass with the remainder forested. This area, formerly managed by the disbanded Department of Plant Science, is situated in the centre of the South Campus Field and has extensive irrigation and drainage improvements. It contains the following:

- 2 concrete bunker-like buildings located at the northern end of the site - these buildings are currently being used to grow forest mushrooms and as a consequence have a number of associated steel growth chambers;
- Abandoned tree and vineyard plots;
- A bud wood nursery;
- A 0.5 ha fenced enclosure; and
- A 0.5 ha community garden.

Plant Operations Rhododendron Nursery - 2.3 ha (5 acres)

This nursery area supplies and maintains a quantity of rhododendron species and cultivars for the University. Much of the plant material is quite established and old (40+ years).

Plant Operations Physical Plant Nursery - 2.7 ha (6 acres)

This nursery facility supplies and maintains a quantity of woody shrubs and trees for the University. Facilities include:

- Lath houses, greenhouses and coldframes;
- A small house/office;
- Equipment storage facilities; and
- Areas for plant storage.

Other Forested Areas

Wesbrook Mall and South Campus Rd. - 3.2 ha (7 acres)

This area contains a large stand of alder indicating relatively recent disturbance. A number of large and beautiful rhododendron specimens have been planted at the edge of this forest along South Campus Rd.

South of Plant Ops. Nurseries along SW Marine Dr. - 4.5 ha (10 acres)

This area buffers the nurseries from SW Marine Dr. It does not appear to be managed by any department at this time.