Acknowledgements

D9A - Thesis Research Component

Introduction

Why Water

Thesis Statement

Thesis Goals

Precedent Study:

Haussmann's Paris

John Thwaites' Metropolitan Board of Works, London

Replacing A Shopping Centre With An Ecological Neighbourhood

Restoration of the Don Watershed Wetlands

Conclusion - Research Component

D9B - Final Development of Design Solution

The Big Idea

Principals / Assumptions

The Master Plan

Summary

Bibliography

List of Attachments

Acknowledgements

This work is dedicated to my wife Elena and my two sons Sven & Kazys; without who's love & support this would not be possible.

My sincerest gratitude & appreciation to all the Syllabus Mentors & Instructors; their undying love for this profession is a inspiration to us all.

A special thanks to my thesis advisors Rainer Fassler, Brendan Avery & Gerry Eckford; your incredible patience and perseverance inspired me to push on. I will be forever grateful for the guidance you have given me.

D9A - Thesis Research Component

Introduction

"Matter, of this is the cosmos, sun, earth and life made Sun, shine that we may live.

Earth - home

Oceans - ancient home

Atmosphere, protect and sustain us

Clouds, rain, rivers and streams, replenish us from the sea

Plants - live and breathe that we may breathe, eat and live

Animals, kin.

Decomposers, reconstitute the wastes of life and death so that life may endure. Man, seek the path of benign planetary enzyme, aspire to be the world's physician. Heal the earth and thyself." ¹

The New Oxford Dictionary defines the word "sustainable" as:

"Able to be maintained at a certain rate or level : sustainable fusion reactions."

"Ecology (esp. of development, exploitation, or agriculture) conserving an ecological balance by avoiding depletion of natural resources."

"Able to be upheld or defended : sustainable definitions of good educational practice." 2

The antonym of this definition, man's modus operandi, is representative of our collective attitudes towards nature, and a reflection of the pedagogical morals of our society. The influences of Judaism and subsequent Christian faiths have extolled man's exclusive divinity over nature. In the first book of Genesis; "God" made man in his own image and gave him dominion over nature. Is it in the literal reading of this text wherein lies our earliest malformed attitudes towards nature? one which encourages exploitation, destruction and perhaps even resentment? For were we not also expelled from the garden of Eden? Hence, the definition frames nature as a "resource".

Historically, man has been unable to fully comprehend the complexities of his biosphere. The current form of urbanization is a reflection of this attitude. A testament to the technological & sociological conditions at time of creation.

Today; there is little debate that human activity is poisoning our biosphere, that we're exceeding the Earth's ability to metabolize the environmental impact of our inhabitation. Our society is acutely aware of the situation; yet, change is slower than the rate of destruction, this is evident in the physical constructs of our society.

¹ McHarg, Ian L. (1969). Design with Nature.

² Oxford Dictionaries. (2010). Oxford University Press.

Could changes in the patterns of urbanization change societies' respect for nature? If one is the physical manifestation of the other; is there a symbiotic relationship present to be exploited?

Humanity is faced with a decision; to be our planets' keeper or its' destroyer. Until the industrial revolution, the impacts of our activities on our biosphere had been negligible. Since the industrial revolution the impacts of our activities have grown at an exponential rate. We, as a society, as a civilization, our facing our own mortality. If we do not find a sustainable alternative to our present pattern of development; we will not survive.

Why Water?

"Water is essential for life. No living being can survive without it." 3

The modern Urban Landscape is the physical manifestation of a multi-disciplinary, multifaceted, complex negotiation between the fields of Architecture, Landscape Architecture, Engineering, Urban Planning and Social & Community Planning. Current sustainability issues engage all these disciplines individually and in relative isolation. The current practice of sustainable design within the context of Architecture; is primarily focussed on the individual site with a particular focus on the individual building. This building centric first step has been out of necessity due to our present political / social-economic framework.

"Sustainability involves, among other things, the notion that human activity and technological systems can contribute to the health of the environments and natural systems from which they draw benefit. This involves a fundamental acceptance of investment in the productivity and diversity of natural systems." 4

The considerations of a truly sustainable habitat are considerably broad, in fact, far too complex to be considered within the scope of this dissertation. Since we are all aware; water plays a critical role in everything on this planet and the fact that; nothing can exist without it. It seems appropriate to examine the role water plays within the current context of our Urban Landscape, making what we do with water more apparent, to increase our awareness and consideration of the impact of our activities on the quality of water as it passes through our urban environment.

Through the hydrologic cycle, water crosses all the physical boundaries of our political-social-economic framework, our affect on its' quality is determined by more than the single building or political-social-economic community. By examining the route water runs through this framework we can establish an awareness of the natural vs political boundaries, an appreciation for the physical expression of the water system, the value of this system for our environment and our urban context.

³ United Nations. (2005). International Decade For Action. WATER FOR LIFE, 2005-2015

⁴ Hough, Michael. (1990). City Form and Natural Processes

Thesis Statement

If the overland flow of water was more apparent in our Urban Landscape, our cities would be considerably more sustainable.

Thesis Goals

To demonstrate that the physical expression of water assists the goals of sustainability awareness.

Increase our awareness of how we use water and our impact on water quality.

Make apparent the natural water processes we benefit from.

Discover opportunities to contribute to the natural systems from which we benefit.

Discover opportunities to increase biodiversity within the Urban Context.

Re-engage the citizens of our urban environment with nature. Re-engage people with the natural environment to promote environmental change within cities. Re-establish the hydrologic cycle within our urban environment.

Social & Community development / involvement / stewardship through the interaction of people & nature.

Challenge the accepted norms of development, examine the impacts of urbanization on watersheds.

Contribute to the biodiversity of the community by the restoration of the natural systems which assist in the cleansing of water.

Re-envisioning the historical & imagined geography of cities.

Precedent Study: Haussmann's Paris

In the middle of the nineteenth century, Paris was a burgeoning modern industrial city restrained by an urban fabric that had been unchanged since the middle ages. The narrow interweaving streets with its' cramped buildings impeded the flow of its' citizens, these narrow streets also carried the collective wastes of these citizens. This resulted in unhealthy and unhygienic conditions, which led to the cholera epidemic of 1832; during which over 20,000 people died. As a result, public & political support was galvanized in support of the "new social medicine", to "let air and men circulate". In 1852 Napoleon, after seeing the transformation of London, embarks on his quest to modernize Paris. Napoleon appointed Haussmann to develop & execute this transformation.

The transformation encompassed all aspects of urban planning; from new sewers (in the interest of public health) to streets, parks, and even the aesthetic quality of buildings. Haussmann moulded Paris into a geometric grid; with new streets running east, west, north & south, dividing medieval Paris into new sections. At the intersections of the great boulevards large public plazas were created; complete with monuments, parks & green spaces. Until 1852, the potable water for Paris came directly from the Seine, but centuries of waste had poisoned the water, making it unfit to drink, this led to the construction of a 600 Km aqueduct to extract water from Chateau-Thierry, the water was held in newly constructed reservoirs within the city limits.

Contemporary criticism of the project denounced the acclaimed imputes of improving social and sanitary conditions for Parisians. Instead, critics accused Napoleon of hiding a militaristic & authoritarian agenda under the theory that wide thoroughfares were constructed to facilitate troop movement and thereby prevent the blocking of streets. Modern criticism notes the disparity between social classes. The uprooting of established working class residential areas which were disrupted and scattered is seen as a security measure in an effort to prevent revolutions to the likeness of 1789 & 1848 where workers revolted against the state.

Precedent Study: John Thwaites' Metropolitan Board of Works, London

Similarly to the example of Paris; the major problem was sewage & traffic congestion. Cholera again, was the imputes for change; in the interest of public health the London sewerage system was constructed. Other activities included slum clearance, new streets to relieve traffic congestion, acquisition and building of bridges. Although the MBW had more than its fair share of scandals & corruption, by the time of its' abolition in 1888, London was transformed, enabled to deal with increased density, increased traffic, while providing a better environment for its' inhabitants.

The raison d'etre is academic; what is fascinating is the apparent connection between the urban fabric of our habitation and social, political, environmental conditions. Our built environment is truly the physical manifestation of our collective attitudes.

Precedent Study: Replacing A Shopping Centre With An Ecological Neighbourhood

Location:

The bedroom community of southern Lake Phalen, suburb of St. Paul, Minnesota.

Context:

A nearly abandoned shopping centre (one of the first shopping malls in the area), had become an eyesore because of low tenancy and the grounds falling into disrepair. The nearby apartment complexes and housing seemed to draw disruptive tenants and were also in a dilapidated condition.

In 1986 a revitalization plan was put forth, to return the shopping centre & adjacent properties back into the wetlands they once were. The idea of a wetland park was first proposed by landscape architect Joan Nassauer, architect Harrison Fraker & the students at the University of Minnesota. The local neighbourhood groups loved the idea and took the initiative in developing the proposal. With the help and collaboration of the City of St. Paul, the Minnesota Department of Landscape Architecture, the Northeast Neighbourhood Development Commission brought the proposal to fruition.

Site & Proposal:

The initial site analysis found that the neighbourhood was part of the Phalen chain of lakes, a popular migration route to nesting and foraging grounds from the Mississippi flyway and rookeries. The initial schematic design called for major interventions, such as removing the Phalen shopping centre and replacing it with the ponds that were filled in during the construction of the shopping centre. The proposed site encompassed approximately 25 to 30 acres, due to this large area, the design called for it to be completed in several phases, the first phase was initiated in 1995.

The primary goals of the project were to provide suitable foraging and nesting areas for some of the birds who used the Mississippi flyway, to restore the wetland and provide both an amenity which could teach and enhance the community, and to restore the hydrologic cycle that had once existed.

The first phase was considered important because it had to galvanize public support. The ecological success for the second phase depended on the social success of the first phase. The crucial goal that the park had to be accepted, depended on framing the more natural components of the wetland with a more manicured park like boarder. The second phase, which had considerable ecological goals to provide; directing public use to maximize experience but minimize impact to the landscape, choosing sustainable native plants compatible with the hydrology, providing specific types of animal habitat, providing a means to monitor vegetative success over time.

Critique:

From an ecological standpoint; the wetlands as created have a permanent open area of water surrounded by a ring of vegetation, the site was historically a wet meadow or bog. "Wet meadow and bog ecosystems have suffered enormous losses in the region, while in contrast, open water wetlands have been on the increase." While the project is applaudable for its' ecological goals, there seems to be a misguidance in terms of biodiversity for the greater region. Furthermore, there have been attempts to increase the visibility into the lowland forests, for observation of habitat by humans, this could alter their composition and function, and ultimately degrade the forest which was intended to be saved. The good news is that the wetland intervention has dramatically increased local biodiversity.

From a community viewpoint; the wetland has become a focal point for the immediate community, and has formed strong ties with the greater Phalen corridor, which has been a catalyst to revitalizing the larger neighbourhood and the connections to downtown St. Paul. The wetland is now synonymous with the identity of the community. Unfortunately, the great success of this development has also been its' failure. Due to poor planning the public amenity of this wetland has become increasingly privatized. The boarder of the wetland has been eroded by development. Instead of relocating the commercial activity from the shopping mall to the boundaries of the wetland, thereby activating its boundaries; it was relocated to the arterial streets, which left the edge condition subject to development pressures. The power of private development has over-whelmed the identity and definition of public space, the opportunism of developers recognized the amenity value of this public wetland park and subjugated it for their own profit. The fact that this public amenity has been allowed to be privatized is both a tragedy and an insult to the initial concept and intension. The size of the park has been substantially diminished, its boarders have been encroached upon by poorly designed instant architecture, which has effectively turned the wetland into a suburban water retention pond. "Perhaps you can take the shopping centre out of the suburb, but not the suburban mindset and building typologies out of the developers and city officials."6

The lessons learned are not wholly tragic; this project has demonstrated the willingness of the public and community as a whole will embrace change, especially for ecological gain and public amenity. Although this particular example lacks the foresight and commitment of the community not to bow to economic pressures, it certainly demonstrated that as a society, we do attach economic and monetary value to our environment. Perhaps with better planning, we as a society, can learn from these types of experiences.

⁵ Ramsey-Washington Metropolitan Watershed District. (1993). Model wetland management plan. Report of RWMD.

⁶ Dunham-Jones, Ellen and Williamson, June. (2009). Retrofitting Suburbia: Urban Design Solutions for Redesigning Suburbs

Precedent Study: Restoration of the Don Watershed Wetlands

Location:

Waterfront of Toronto, Ontario, Canada Specifically; The Central Waterfront, The East Bay Front, The West Don Lands, The Lower Don Lands, The Gardiner Expressway, The Port Lands, and other minor areas along the greater waterfront.

Context:

A deteriorating waterfront due to many years of industrial misuse, disconnection from the city, environmental degradation, & abandonment. Prompted a comprehensive study to revitalize the waterfront lands and reconnect it to the people and communities of the city as a whole.

Site & Proposal:

The revitalization of Toronto's waterfront is an enormous task, it will take many decades to complete. The total area slated for redevelopment is close to 2,000 acres. Considering the size and complexity of this undertaking it has been divided into 6 major phases.

Central Waterfront:

The plan by West 8, Rotterdam and DTAH, Toronto (winners of the 2006 central waterfront design competition) will create new public spaces which will be connected to major waterfront destinations utilizing a large public boulevard along the waters edge. The introduction of this promenade and with the intervention into the lakes edge with a series of piers, the design hopes to activate the waterfront and strengthen the connection between the city & the lake.

East Bay Front:

A neighbourhood development (precinct area plan lead: Koetter Kim & Associates) composed of mixed uses intertwined with parks, and public amenity spaces. Historically the area was marshland, filled in during the 1950s in support of the burgeoning shipping and port activity. The area has laid dormant for nearly 2 decades, its' proximity to the downtown core has leant its self to transit oriented development. With the possibility of 6000 residential units (including 1200 affordable) and nearly a million sqft of mixed commercial space. The area is mostly city owned property, which, if managed properly will pay for the significant share of the redevelopment costs of the associated waterfront revitalization.

West Don Lands:

A neighbourhood development (precinct area plan lead: Urban Design Associates & DTAH, Public Realm and Urban Design Teams: The Planning Partnership & Phillips Farevaag Smallenberg & Co.) The neighbourhood will be the site for the 2015 Pan American Games' Athletes' Village. Historically, the site was part of the Old Town of York. After the arrival of the railway in the 1850s the area quickly became a mix of industrial uses. Over the years of industrial occupation the Don River was straightened, Taddle creek was buried, and the marshes were filled in and the land was leveled. The area has been mostly dormant since the Provincial government took title in 1996. The vision for the neighbourhood and area will see the development of a pedestrian orientated streets called "Woonerfs" these will blur the boundary between sidewalk and street and provide a common public space shared by pedestrians, cyclists and lowspeed vehicles. This new transit orientated community will accommodate approximately 6000 new residences, 23 acres of park including the Don River park, as well as other mixed use developments. The focal point for this new neighbourhood will be the new Don River Park; it will transform an abandoned post industrial site into a large outdoor public amenity hosting a variety of activities. Ecologically speaking, this park will reintroduce a marsh and woodland typology that had once existed before the arrival of the railway. This marsh and woodland will provide habitat supporting the native flora and fauna that once flourished here.

Lower Don Lands:

The design team of Michael Van Valkenburgh Associates Inc. (MVVA), Brooklyn, N.Y. A new system of sustainable parks and communities have been envisioned to celebrate the naturalization of the Don River mouth - a centerpiece to the entire revitalization scheme of the Toronto waterfront. The entire site encompasses over 300 acres including; 130 acres of parks and public amenities, over 12,000 new sustainable residences, and over half a million square foot of commercial and retail space. All in close proximity (20 min. walk) to downtown. Historically the port lands were once the largest natural wetland on the great lakes. The area was dramatically changed in the late19th and early 20th centuries, when development pressures for more industrial area was needed adjacent to the lake. By 1922 more than 500 acres of wetland had been filled in for this purpose. By 1950s the mouth of the Don River had become lost and cut off from the city by the Gardiner Expressway.

Wider Waterfront:

Toronto's waterfront revitalization plans are not limited to the East Bayfront and West Don Lands, but also includes the entirety of the waterfront. Numerous projects have been initiated to improve the connection between the citizens and the waterfront with the development of parks and linkages across the entire breadth of the waterfront.

Gardiner Expressway:

Currently under study to determine the future potential options including; removal, replacement, enhancement or maintaining the status quo.

Critique:

Sustainable urban development is not simply a community of Leed certified buildings. Toronto's revitalization of the waterfront is one of the largest brownfield remediation projects in the world. There are many aspects of its' sustainable framework that are applaudable including; expanding public transit to be accessible within a 5 minute walk from places of work & live, provision of a district energy system which will allow future energy technologies to be incorporated, dramatic increases in public parks and spaces, mandatory green building requirements & in place soil remediation. Yet there is a conspicuous lack of information regarding water & wastewater management. There is however, evidence of trial based grey water recycling and 100 % of rainwater capture (to be used in Don River Park). A community cannot be considered "sustainable" if its' wastes are simply transported elsewhere.

There is however, evidence of lessons learned; there has been a conscious effort to make a clear delineation between public & private to avoid encroachment. Although there are many opportunities for developers to reap the economic benefits associated with development in the precincts; if the public interests are protected, this could have the additional benefit of increasing density and thereby relieving pressure for suburban development models. This will be a project to watch and see how successful the environmental and social goals will become.

Conclusion - Research Componet

"So there is a new task - to understand the way the world works, regulate behavior in response to to this knowledge, restore the earth, green the earth, heal the earth."

How do we move forward? As demonstrated in the examples of Haussmann's Paris, John Thwaites' London and the more recent projects in St. Paul & Toronto. The pattern & composition of urban development is defined by our collective social and environmental needs. Our ideals are physically manifest in our urbanism. We have gained enough empirical evidence and knowledge to see that the destruction of nature will only precipitate our own destruction. We have an opportunity to become the steward of nature, of creating a better fit for man-environment, perhaps even a symbiotic relationship. This knowledge, this aspiration, should also be manifest in the physical form of our future urbanism & architecture.

It is common knowledge that the concentrated wastes developed through urbanization are injected into our environment with little consideration for their immediate and long term effects. Pollution loads into the environment have caused and continues to cause the gradual deterioration of our water & environmental resources. The current form of urbanization precludes consideration of the ecological & hydrological cycles. This waste has the potential to be of significant benefit to civilization & the environment, if this waste can be used within the ecological cycle, then it is no longer "waste".

The elements of the natural environment which could utilize the waste in the ecological cycle, have been relegated to subsurface existence, or marginalized as fillers in the space between buildings. In order to re-engage the natural cycles we must celebrate their existence and function. In doing so we will turn waste into food, carbon dioxide into oxygen, monoculture into biodiversity and discover the truer meaning of sustainability; "the long term maintenance of well being" 8.

A purely Architectural response to the issues raised through this research would be folly. An appropriate response requires a thoughtful, conscientious Urban Intervention to which an Architectural response would facilitate a dialogue about the complex interdependence between man and nature.

Any Urban Intervention would need to take into consideration the broader community into which it is inserted to be meaningful. The broader community in this instance would not be defined by traditional geo-political means, instead it would be determined as an area of a particular watershed. The proposal then, is to study a watershed to determine the specific site(s) at which an Urban Intervention would make sense; only then could an Architectural response be formulated and realized.

⁷ McHarg, Ian L. (1991)

⁸ Wikipedia http://en.wikipedia.org/wiki/Sustainability

D9B - Final Development of Design Solution

The Big Idea

Re-establish Brewery Creek as part of an urban intervention to restore overland flow of water, thereby re-establishing the predevelopment water characteristics of; infiltration, evapotranspiration, temperature and run-off rates to receiving bodies of water.

Brewery Creek was the chosen watershed due it's historical significance to Mount Pleasant & The City of Vancouver. The settlement of Mount Pleasant started in the areas adjacent the creek. Initially Brewery Creek was used to power saw mills at its terminus into the False Creek tidal marsh. Later development along the creek came in the form of slaughter houses then many breweries. To this day, nearly 100 years since the creek was filled in, this creek is still present in the collective memory of the Mount Pleasant residents. There are still traces of its existence present in the physical arrangement of the urban fabric; at a few of the manholes along the route of the creek, one can still hear the sound of the rushing water of the creek buried in concrete and clay pipes just below the surface.

Principals / Assumptions

The following principals and assumptions were established to limit the scope of the intervention in order to focus on the issues surrounding water, and to have a clearer understanding of the impacts on a known condition. Additionally, there was a realization that without limiting the scope, this project could not be completed in the timeframe required by the course syllabus.

- Existing density of the watershed area to remain as per the current condition.
- Existing zoning to remain with the exception of the specific location of the intervention.
- · Maintain existing links with neighbouring communities and the greater metro area.
- Ideas of how the intervention may transpire were not specifically addressed, only the final goal (master plan) was developed.
- · This project is about water, each decision needs to be in the service of water.
- Improve the quality of the water leaving this watershed.
- · Retain as much water as possible for infiltration & evapotranspiration.
- Provide interconnected green / naturalized spaces for improved bio-diversity.

The Master Plan

Create a series of bio-swales utilizing the existing city street & lane network. These bio-swales will transport water overland to the approximate location of the original brewery creek system and down to the wetlands / small lake which forms the headwaters for Brewery Creek.

From this "lake" the water follows a course close to the original alignment; this alignment has been modified to respect the past 100 plus years of development that has occurred in Mount Pleasant.

The headlands (south of lake) collect water from a mostly residential area, water is seasonal and directly related to rain events. Because there hasn't been intensive urban development in these areas, the creek is simply placed where topography dictates; the urban fabric is simply interrupted.

The area of the lake is determined by topography & water volume. The amount of additional land removed from the urban fabric is dictated by several factors; the existing pattern of urban development, the topography, the hydrologic processes and the need to create differing bio-environments. This land contributes to the lake & creek by; intensive small plot organic farming which produces nutrients within the run-off to help support fish & wildlife habitat. The farming and associated bio-swales remove pollutants from the water & reduces the temperature of the water.

The configuration of the remainder of the creek is determined by several factors including; a more formal response to the developed urban fabric, the ecological & water related goals, the requirements for fish & wildlife habitat, the goal to make nature more accessible to the inhabitants of this watershed & an exciting urban experience.

Summary

Certainly the water & ecological goals stated previously can be easily met with this master plan, and although this may be true, it would be unlikely to succeed without developing the many possible benefits to the urban environment for the inhabitants.

Although not specifically addressed in the Master Plan; during the final crit / review, the notion of implementation was discussed at some length. Questions regarding the possibility of a phased development or whole sale interruption to build it out completely in a single phase were discussed. It was generally agreed that a phased implementation would be the most realistic. Upon reflection I would also assert that a phased implementation could enhance the livability of the urban environment and provide many social benefits while working towards the big picture that the master plan lays out.

From an Architectural point of view; the true value of this intervention lies within the benefits for a better urban experience. By making the the natural water processes more apparent in the urban fabric it raises our awareness of the value of these resources.

The urban environment envisioned by this master plan would be an exciting urban experience and considerably more sustainable than the status quo.

Bibliography

Baroni, L.; Cenci, L.; Tettamanti, M.; Berati, M. (2007). Evaluating the environmental impact of various dietary patterns combined with different food production systems. European Journal of Clinical Nutrition 61 (2): 279–286

Burian, Stephan J. Nix, Robert E. Pitt, and S. Rocky Durrans. (2008). Urban Wastewater Management in the United States: Past, Present, and Future. Journal of Urban Technology, Volume 7, Number 3, pages 33-62. Copyright © 2000 by The Society of Urban Technology.

ClimateWorks Foundation, Global Environment Facility, European Commission, McKinsey & Company, The Rockefeller Foundation, Standard Chartered Bank and Swiss Re. (2009). SHAPING CLIMATE-RESILIENT DEVELOPMENT A REPORT OF THE ECONOMICS OF CLIMATE ADAPTATION WORKING GROUP a framework for decision-making.

Dowdell, Jennifer, Fraker, Harrison, & Nassauer, Joan. (2005). Replacing a Shopping Center with an Ecological Neighborhood [To Rally Discussion]. Places, 17(3), . Retrieved from: http://www.escholarship.org/uc/item/9kz1m3b1

Dunham-Jones, Ellen and Williamson, June. (2009). Retrofitting Suburbia: Urban Design Solutions for Redesigning Suburbs

Fraker, Harrison. (2000). Housing the Next Ten Million: Visions for California's Central Valley [Dispatches]. Places, 13(1), . Retrieved from: http://www.escholarship.org/uc/item/0zw461zf

Fraker, Harrison. (2007). The Importance of "Place" at the Bellagio Global Summit [Dispatches]. Places, 19(3). Retrieved from: http://www.escholarship.org/uc/item/1cw4225w

Fraker, Harrison. (2007). Where is the Urban Design Discourse? [To Rally Discussion]. Places, 19(3). Retrieved from: http://www.escholarship.org/uc/item/83g1v38c

Fraker, Harrison. (2008). Calls to Action -- Linking Science to Design. Places, 20(2), . Retrieved from: http://www.escholarship.org/uc/item/6k5586cn

Gapminder is a non-profit venture – a modern "museum" on the Internet – promoting sustainable global development and achievement of the United Nations Millennium Development Goals. http://www.gapminder.org/

Haas, Lawrence J.M. (2008). Contributing authors: Kristin Schumann and Richard Taylor. Climate adaptation – Aligning water and energy development perspectives. Hophmayer-Tokich, Sharon. (2006). The Center for Clean Technology and Environmental Policy, University of Twente, at the Cartesius Institute, Zuidergrachtswal

3, 8933 AD Leeuwarden, The Netherlands. (2006). Wastewater Management Strategy: centralized v. decentralized technologies for small communities.

Kartha, Dr, Sivan. Siebert, Clarisse Kehler. Mathur, Dr Ritu. Nakicenovic, Professor Nebojsa. Ramanathan, Professor V. Rockström, Professor Johan. Schellnhuber, Professor Hans Joachim. Srivastava, Dr Leena. Watt, Robert. (2008). A Copenhagen Prognosis: Towards a Safe Climate Future; A Synthesis of the Science of Climate Change, Environment and Development.

Kulshreshtha, S.N. (1998). A Global Outlook for Water Resources to the Year 2025. Water Resources Management 12 (3): 167–184.

Legge, James. (1891). Sacred Books of the East, Vol 39 - Translation of the Tao Te Cing

McHarg, Ian L. (1969). Design with Nature.

Morrish, William R. (1996). Civilizing Terrains.

Nassauer, Joan I. (1997). Placing Nature.

Nelson, Valerie I. (2008). Coalition for Alternative Wastewater Treatment INSTITUTIONAL CHALLENGES AND OPPORTUNITIES: DECENTRALIZED AND INTEGRATED WATER RESOURCE INFRASTRUCTURE

Ramsey-Washington Metropolitan Watershed District. 1993. Model wetland management plan. Report of RWMD.

Seattle Public Utilities, Utility Systems Management Branch and the Department of Planning and Development. (2008). Onsite Wastewater Treatment Systems: A Technical Review.

Spirn, Anne Whiston. (1998). Language of Landscapes.

United Nations. (2005). International Decade For Action. WATER FOR LIFE, 2005-2015

United Nations. (2008). Food and Agriculture Organization.
CLIMATE CHANGE, BIOENERGY AND FOOD SECURITY: OPTIONS FOR DECISION MAKERS IDENTIFIED BY EXPERT MEETINGS

World Business Council For Sustainable Development. (2005) Water: Facts and Trends - version 2

The 2030 Water Resources Group. (2009). Charting Our Water Future - Economic frameworks to inform decision-making

List of attachments

The following panels were presented at D9A final, and are attached for reference:

Vince Knudsen BC950007 D9A Board 01 - Diagram.pdf

Vince Knudsen BC950007 D9A Board 02 - Present Engineered Condition.pdf

Vince Knudsen BC950007 D9A Board 03 - Natural Drainage & Catchment Areas.pdf

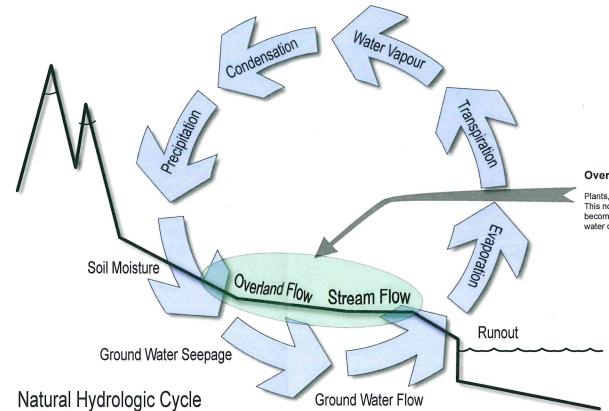
Vince Knudsen BC950007 D9A Board 04 - Lost streams.pdf

Vince Knudsen BC950007 D9A Board 05 - Brewery Creek Catchment.pdf

The following panels were presented at D9B final, and are attached for reference:

Vince Knudsen BC950007 - The Final Presentation - Master Plan.pdf

Vince Knudsen BC950007 - The Final Presentation - Details.pdf



Influence of Engineered Watershed

Contensation Water Vapour List is a Redute limit live a Redute l

Overland & Stream Flow

Plants, Animals, Insects, Microorganisms make use of the water in this portion of the cycle. This not only benefits these life forms, but also transforms waste products from one organism to become food for another. It is in the portion of the hydrologic cycle that has the greatest affect on water quality & biodiversity.

Elimination of Overland & Stream Flow

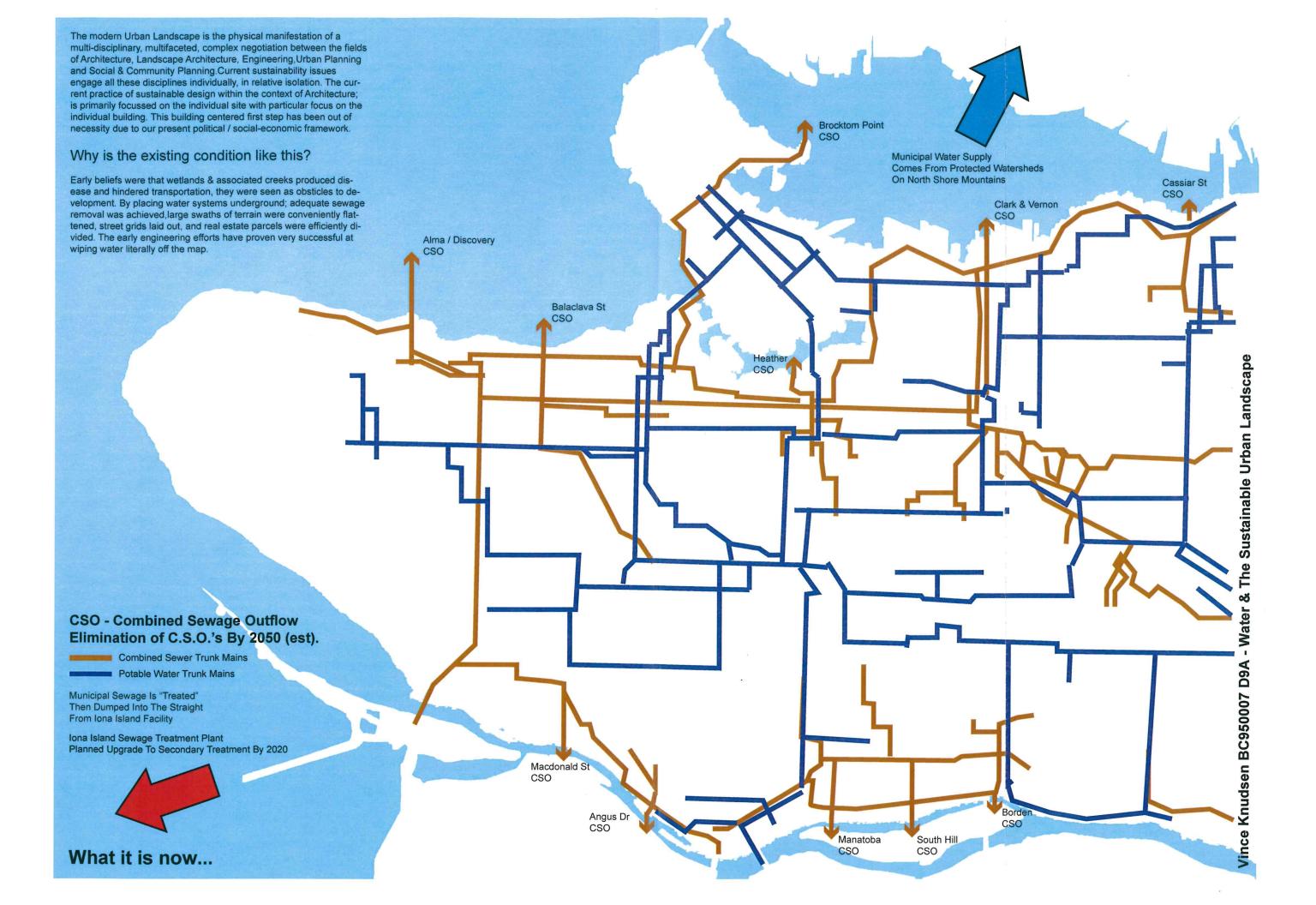
It is at this point in our urban hydrologic cycle where we circumvent the natural processes; through the elimination of overland flow & stream flow the cycle has become shunted. By this action we have eliminated many processes which contribute to the natural environment, and have considerable negative affects on biodiversity.

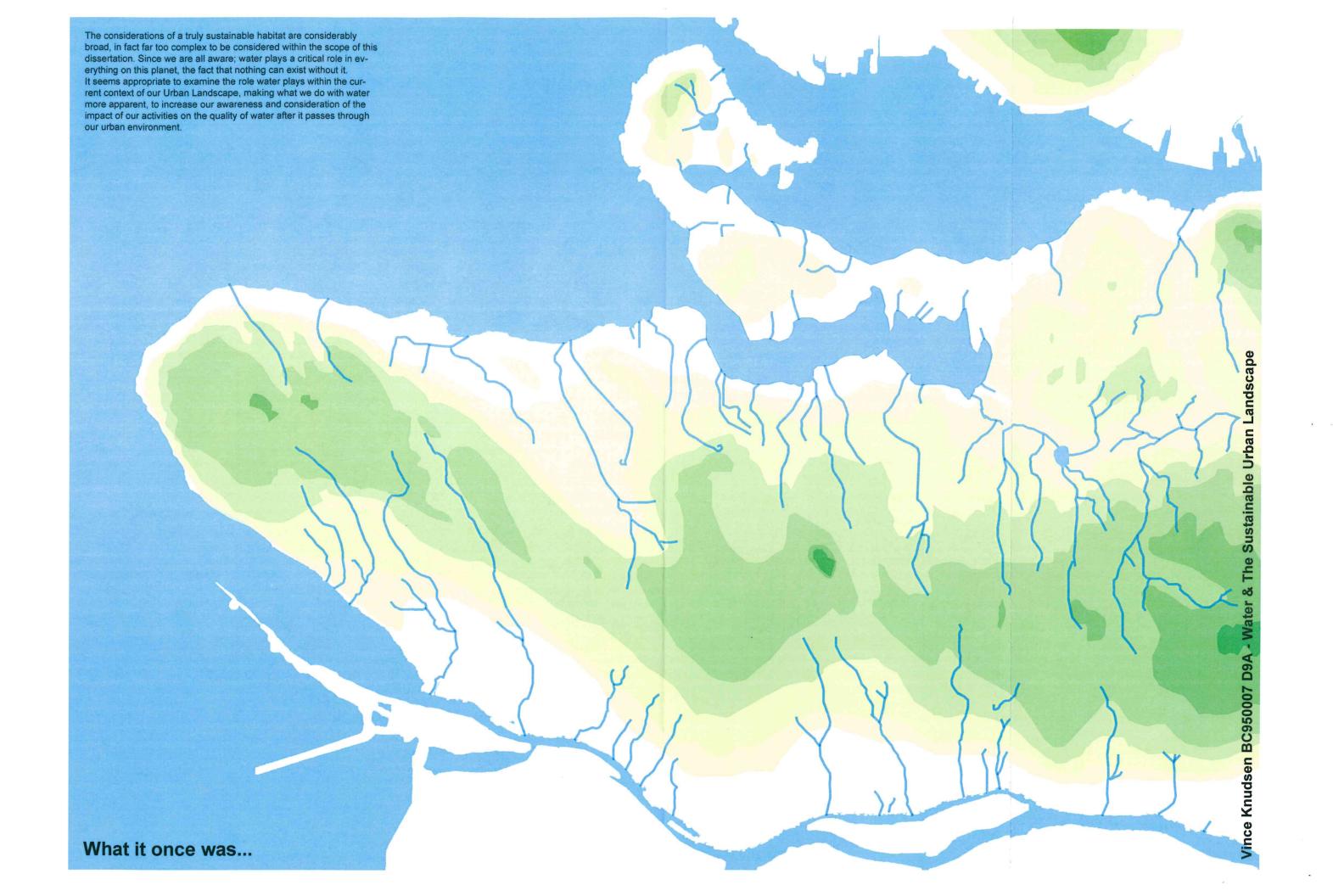
Reduction of associated bio-rich areas of stream beds equals a reduction of the temporing effects these areas have on the immidiate environment.

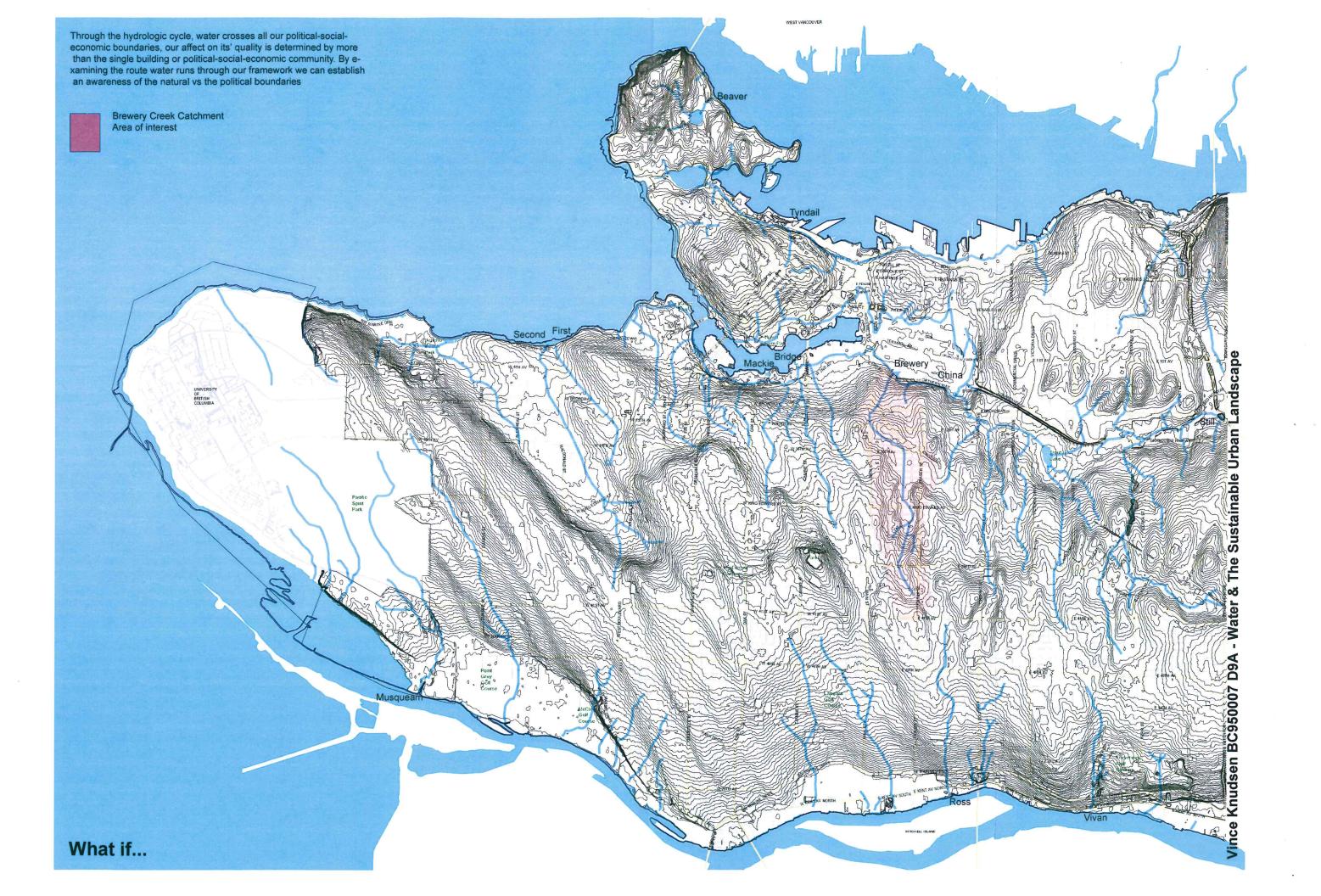
Collection & "Treatment" (City Sewers)

The collection of waste products from our urban environment is efficiently collected & disposed of; through a network of underground pipes, pumps, & sewage treatment processes. This process is "out of sight" and therefore "out of mind" to the inhabitants of our urban environment.

Hydrologics







By making the water cycle apparent in our Urban Landscape I hope to: Increase our awareness of how we use water. Increase our awareness of our impact on water quality. Make apparent the natural water processes we benefit from. Discover opportunities to contribute to the natural systems from which we benefit. Discover opportunities to increase biodiversity within the Urban Context. Re-engage the citizens of our urban environment with nature & foster a better understanding of the natural systems from which we all draw benefit.

What value would this add to the community?

What would be the key elements required to accomplish this?

Social & Community development / involvement / stewardship through the interaction of people & nature.

Educational; challenging the accepted norms of development, examing the impacts of urbanism on watersheds. Changing ideas of streams within cities & how they can affect the environment.

How the restoration of the natural systems can not only assist in the cleansing water, but also contribute to the biodiversity of the community.

Re-envisioning the historical & imagined geography of cities

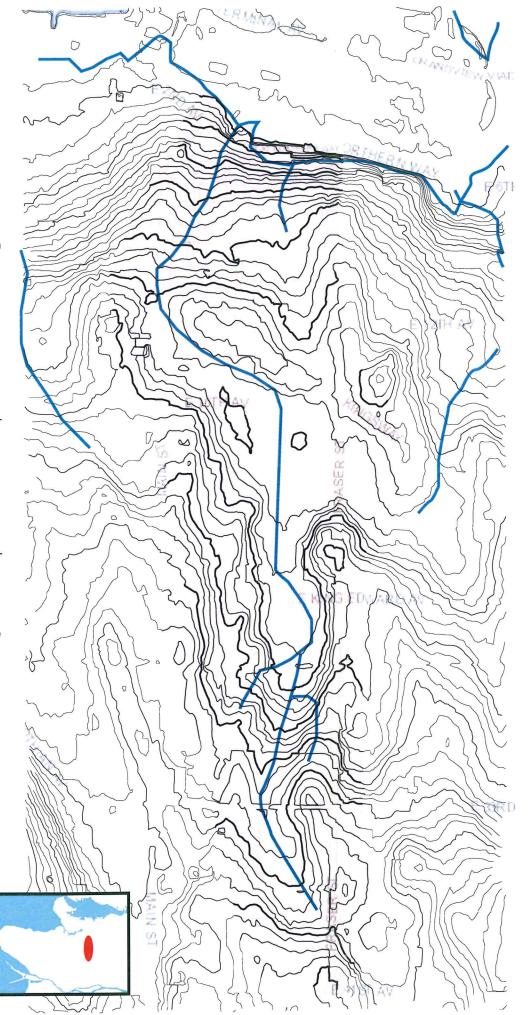
A practical demonstration of how removing streams from buried conditions restores life and health to streams, reduces flooding saves money, and creates valuable public ammenities.

Re-engage people with the natural environment to promote environmental change within cities.

A series of interventions which form a circut or procession which can be followed around.

A nartive which has not only an educational componet, but also an environmental componet.

"No single park, no matter how large and how well designed, would provide the citizens with the beneficial influences of nature...A connected system of parks and parkways is manifestly far more complete and useful" – Frederick Law Olmsted















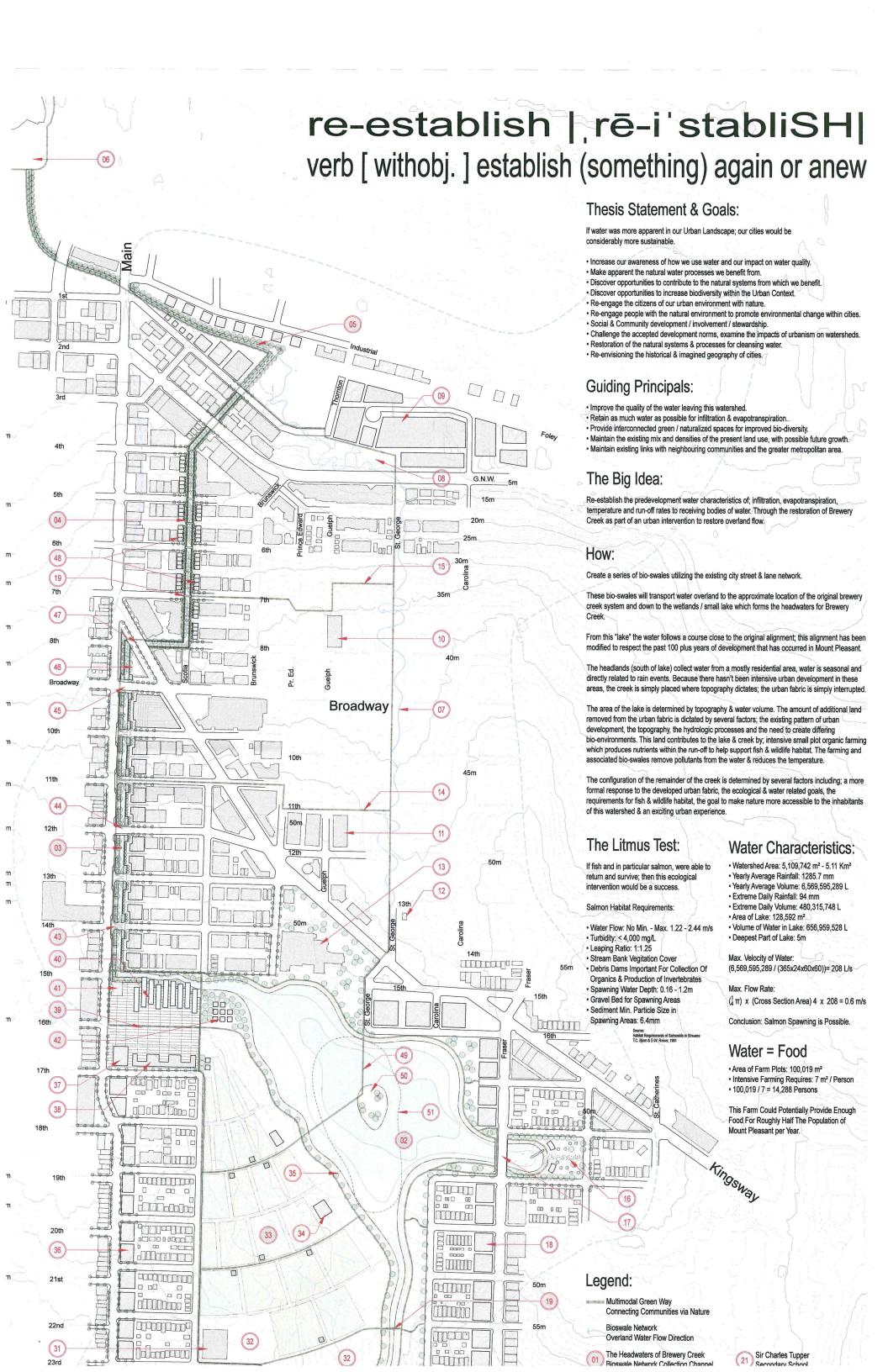


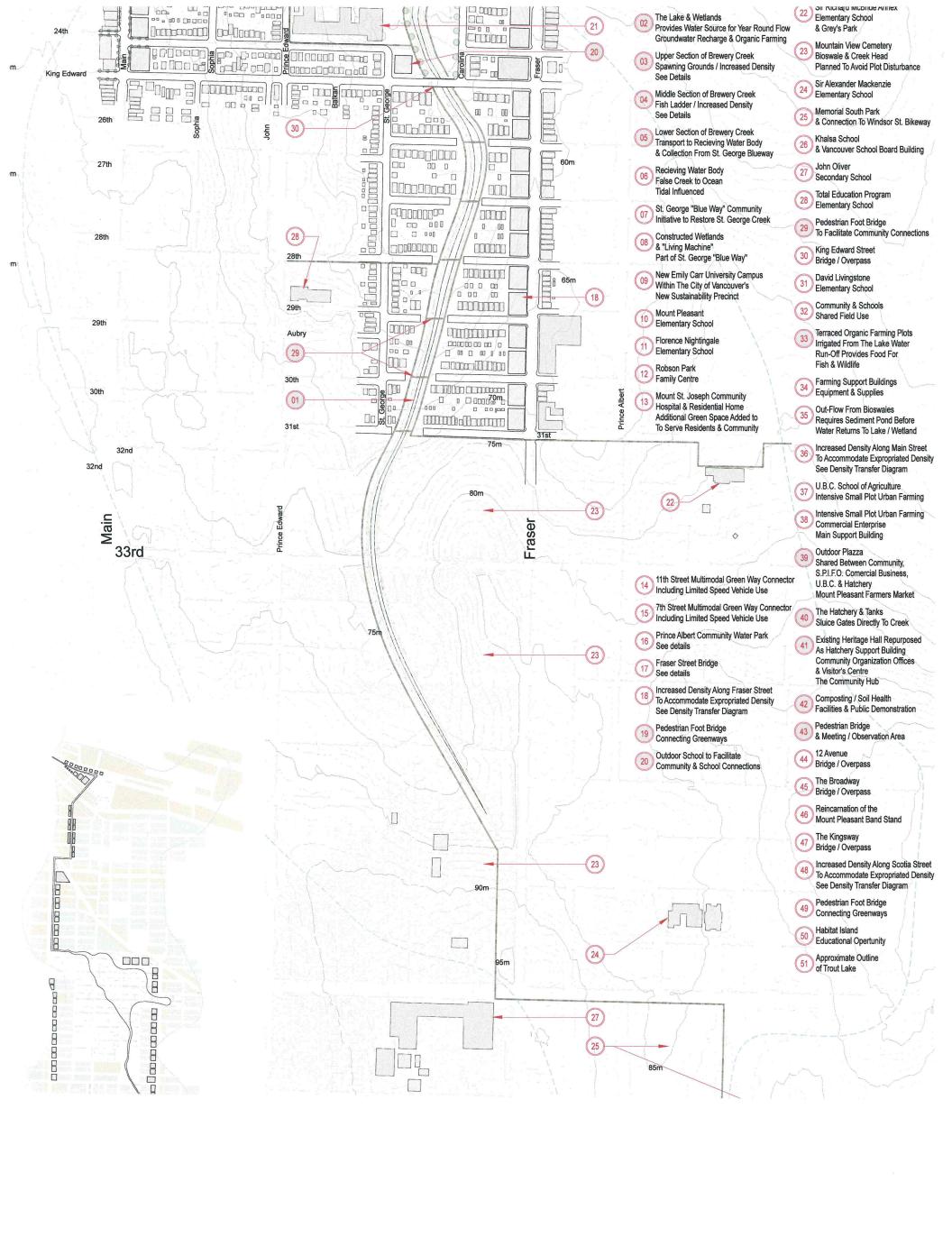


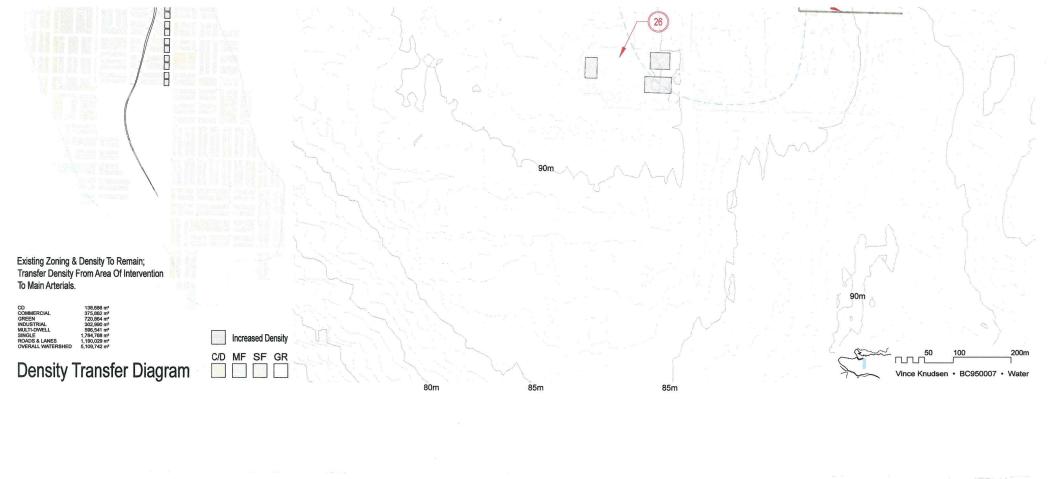














re-establish | rē-i stablish | verb [withobj.] establish (something) again or anew

Why Water:

Sustainability involves, among other things, the notion that human activity and technological systems can contribute to the health of the environments and natural systems from which they draw benefit. This involves a fundamental acceptance of investment in the productivity and diversity of natural systems. (1990, Hough, Michael. City Form and Natural Processes)

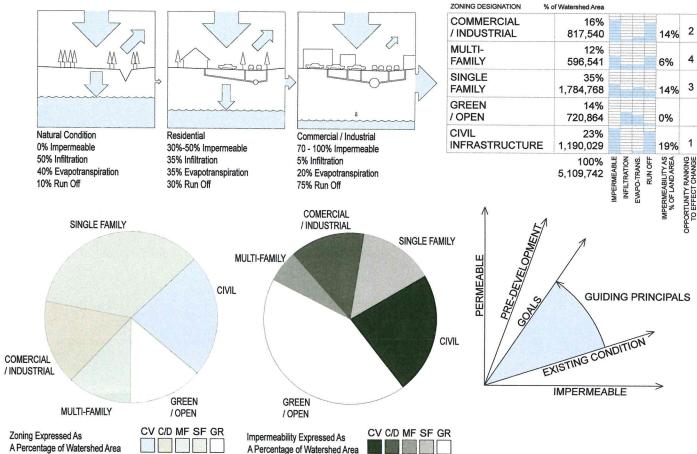
The modern Urban Landscape is the physical manifestation of a multi-disciplinary, multifaceted, complex negotiation between the fields of Architecture, Landscape Architecture, Engineering, Urban Planning and Social & Community Planning, Current sustainability issues engage all these disciplines individually, in relative isolation. The current practice of sustainable design within the context of Architecture; is primarily focussed on the individual site with particular focus on the individual building. This building centered first step has been out of necessity due to our present political / social-economic framework.

The considerations of a truly sustainable habitat are considerably broad, in fact far too complex to be considered within the scope of this project. Since we are all aware; water plays a critical role in

everything on this planet, the fact that nothing can exist without it. It seems appropriate to examine the role water plays within the current context of our Urban Landscape, making what we do with water more apparent, to increase our awareness and consideration of the impact of our activities on the quality of water after it passes through our urban environment.

Through the hydrologic cycle, water crosses all our political-social-economic boundaries, our affect on its' quality is determined by more than the single building or political-social-economic community. By examining the route water runs through our framework we can establish an awareness of the natural vs the political boundaries.

By making the water cycle apparent in our Urban Landscape I hope to: Increase our awareness of how we use water. Increase our awareness of our impact on water quality. Make apparent the natural water processes we benefit from. Discover opportunities to contribute to the natural systems from which we benefit. Discover opportunities to increase biodiversity within the Urban Context. Re-engage the citizens of our urban environment with nature & foster a better understanding of the natural systems from which we all draw benefit.



Water Absorption Diagram

CV C/D MF SF GR

Bioswale Network:

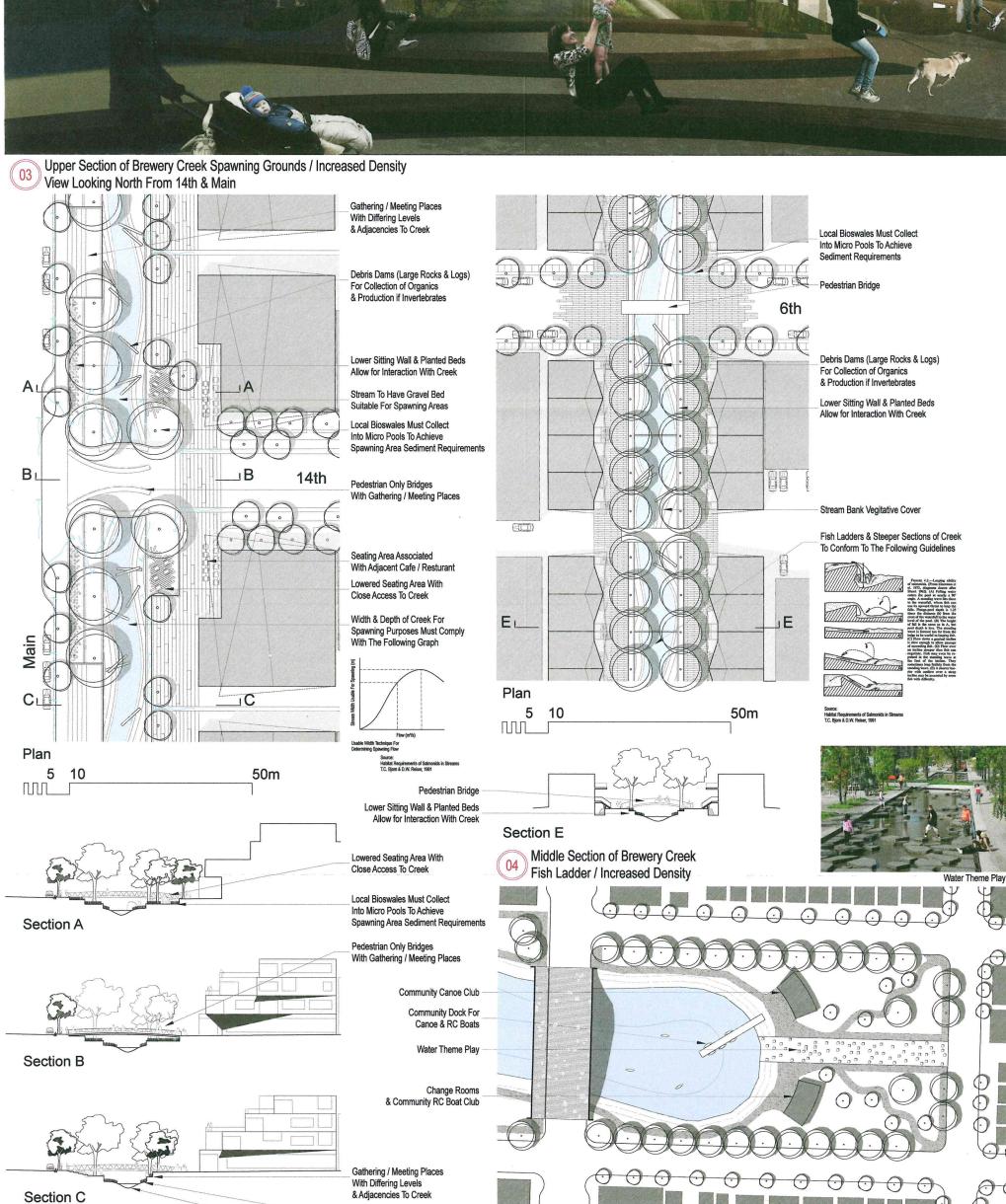
The technical requirements for the design of the bioswale network are fairly straight forward. In simple terms they provide overland drainage of run off water designed to allow for maximum ground water re-charge, and include vegetation for the removal of contaminants &

The specifics in terms of material choice, geometry, placement, plant choice, etc., would need to be site specific.









Stream Bank Vegitative Cover

Stream To Have Gravel Bed

Suitable For Spawning Areas

Prince Albert

Community Water Park

Vince Knudsen • BC950007 • Water

Upper Section of Brewery Creek

Spawning Grounds / Increased Density