BRITANNIA BEACH ENVIRONMENTAL MINING RESEARCH CENTRE
Community Design Charrette | Design Brief

Prepared for:

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DESIGN BRIEF

INTRODUCTION

The following spatial targets and performance objectives provide the basis for charrette designs. The spatial targets reflect the approximate floor area of the research facility upon completion of the CFI letter of intent. These spatial targets include a 10% allowance for unknowns and contingencies related to building servicing, safety and other factors. While slight modifications to these figures may occur over the time horizon of the project design process, designers should work within these spatial parameters for the purposes of the charrette.

The performance objectives are organized under the categories of 1) Green Infrastructure, 2) Community Infrastructure, 3) Energy Efficiency and Resource / Materials and Resource Conservation, and 4) Working Environment and are intended as a framework for optimizing the performance of the research centre within the context of broader goals and objectives for the project.

It is important to emphasize that while these performance objectives are explicit, they are not mutually exclusive. For example, several ecological infrastructure performance objectives cannot be achieved in isolation from a number of community infrastructure requirements. The synergies between each of the four categories should be considered throughout the design process as a generator of innovative and feasible proposals for the research facility.

SITE PROGRAM AND SPATIAL TARGETS

	acres or sq. ft.	hectares or sq. m.
Total Site Area (estimate)	1	0.405
Total Building area (gross)	29,594	2,751
Total Population - Permanent Staff + Researchers	65	
Building Facilities Program		
Research / Lab Space / Storage	7,786	724
High Head Areas (Eng.)	3,048	283
Engineering Facility	8,282	770
Clean Rooms - IT	1,106	103
Office / Storage	4,204	391
Green House space	880	82
Corridors / Circulation	4,288	399
	29,594	2,751

Site Program		
Parking	1 space per full time researcher / staff + 1 space per 2 auxiliary research staff; share with compatible, adjacent uses. [1]	
External Circulation System	Integrated system of well-lit paths connecting individual building spaces and connecting to adjacent structures (e.g., greenhouse, outbuildings).	
Total Open Space	Area equal to building footprint	
Water Management / Biofiltration Wetland Area	XX sq.ft.	to be determined
Outdoor Laboratory / Demonstration Area?	XXX sq. ft.	to be determined

Performance Objectives

1 Green Infrastructure

Goal: *Use natural systems as a basis for structuring the site – to reduce cost, to restore the health of the site, to enhance future development potential and to reveal the environmental processes occurring on the site.*

Siting and Configuration

Designers are to suggest an optimum parcel size to accommodate the research facility and outdoor program elements described above in the Site Program and Spatial Targets. Site development proposal should strive to maximize synergies with the vision for Britannia Beach and investments currently underway or pending (i.e., Sea to Sky Corridor, NRCAN proposal for an interpretive centre and historic park, MWALP water treatment plant).

While a specific site and parcel size for the Research Centre has yet to be determined, several potential sites in Britannia Beach North (also known as the Fan Area) are currently being considered by UBC-CERM3. These include:

- Adjacent to the BC Museum of Mining
- On or adjacent to the baseball diamond
- North of the post-office, adjacent to the community centre
- On the LWBC parking lot

Additional sites within the study area may also be contemplated and should reflect broad context of future community planning and land use decision-making for Britannia Beach.[1]

While specific zones have been designated within the study area (including Park, Flood Management, Tourist Commercial, and Industrial), designers are invited to suggest refinements to this land use framework in order to achieve synergies amongst other initiatives pending for the larger site (mentioned above).

Develop a site program that addresses access and circulation needs from the Highway and from within the community.

Orient and design the building(s) to maximize control of excess solar heat gain, day-lighting and visual access.

Site Mitigation and Reclamation

Consideration of steep slopes, vegetation and watercourses should figure prominently in the siting and configuration of the building (s). Slopes in excess of 15% should be avoided; however, designers may consider how to incorporate steep sloped areas into the working function of the facility, given other performance objectives related to integration with the complementary uses such as the proposed water treatment facility.

Designers should explore potential opportunities to contribute to the mitigation of environmental issues brought about by natural phenomena (i.e., flooding, debris flows) in building siting and design.[2] With this in mind, designs are to consider site preparation and construction strategies that mitigate negative environmental consequences of development and work to heal the site over the long term.

Stormwater / Wastewater Management

Building siting and configuration should optimize the health of the site and larger watershed through integrated stormwater best management practices. Building, parking and other developed areas should be designed to capture, absorb and/ or store water according to site and environmental constraints.[3]

The existing condition of the Fan Area limits the use of standard biofiltration / percolation as a strategy for managing and treating polluted stormwater from parking and road surfaces. Instead, an above-ground, sealed system may be preferable in order to transport polluted stormwater to bio-remediation and grey water treatment areas prior to it being discharged into receiving water bodies.

Designs are to consider the use, type, placement and design of the bio-remediation system for on-site stormwater and / or waste treatment. The location, sizing and placement of such a system(s) should articulate the various goals for integrating various programmatic elements both on and off the site. Similarly, consideration should be given to how such a facility could serve the surrounding community. (For example, a solar aquatics system for treating sewage may likely only be feasible if it served the surrounding community.)

Roofs, paths, and other built surfaces should be designed to manage unpolluted rainwater through the use of surface or subsurface storage systems (e.g. green roofs, vegetated swales). Rainwater from these areas can be reused as a non-potable water source.

Vegetation and Habitat

Vegetation, site construction and ecological infrastructure strategies should be appropriate to the local soil, hydrological system and climate.

Designs should preserve, establish, or re-establish native vegetation in site and building design in order to enhance / restore native biodiversity.[4]

2 Community Infrastructure

Goal: *Design a self-reliant facility that contributes to the image, identity and health of Britannia Beach and assists in catalyzing future planning efforts.*

Siting and Configuration

As per Green Infrastructure performance objectives, designers are to select a site of an appropriate size that reflects existing land use and environmental goals while capitalizing on site features and phenomena (i.e., topography, existing roads and buildings, land use designations, cultural history).[5]

Siting choices should anticipate the additional traffic generated by the centre as well as that generated by other potential uses within the vicinity and consider appropriate access and egress from the Highway and / or from within the community. Visibility of the facility from the Highway / access road should also be an important consideration in siting and orientation.

Designs should consider the most appropriate massing, configuration, and orientation for the research facility within the context of existing site constraints and other Design Brief performance objectives. Designers should consider how best to resolve the relationship between seemingly contradictory performance objectives (i.e., reducing the environmental impacts of building surfaces on ground water quality and maximizing the connections between indoor and outdoor spaces). A range of building and landscape typologies should be considered – from one storey single-building complexes, to multi-storey campus arrangements.

The most appropriate form and architectural language should be considered, recognizing the research centre as an important new addition to an existing, historic community.[6] The architectural expression for the building(s) and landscape should be sympathetic to the existing historic context without slavishly mimicking the historic style.[7] Consideration should be given as to how the building reflects and embodies the particularities of the site, including climate, natural phenomena (i.e., forest, water, wind) and materials and processes related to mining. The qualities of materials should be considered carefully as a means of evoking ideas about the ecology, history, and current use of the site.

Spatial Relationships and Community Links

The site program and development strategy should build synergies between the facility, the mining museum and historic mine and community structures. For example, the layering of stormwater and open space functions into the site program can simultaneously satisfy ecological infrastructure and open space objectives and create additional synergies between the centre and the surrounding community. Similarly, incorporating indoor and outdoor areas for revealing research-related and natural processes occurring on the site increases the educational scope of the facility and encourages environmental stewardship.[8]

The centre should be linked to a network of parks and pathways that connect to other facilities such as the Mining Museum, the trail network, and the Howe Sound waterfront.[9]

Parking

Minimize the visual and ecological impacts of parking areas through careful siting, configuration and allocation of spaces on (and off) the site.[10]

- Provide .5 on site space per full time research staff. Provide 0.25 spaces per temporary / auxiliary research staff. Assume parking on both sides of surrounding streets to be built as part of this project. Shared parking with adjacent, compatible uses can be used to further reduce on site parking numbers.[11]
- Minimize the amount of surface area consumed by parking lots. Give preference to parking as one of a number of functions that can occur on surrounding and access streets. Explore incorporating parking into the building envelope or under the building.
- Exterior lighting in parking areas and around the building should meet visibility and safety needs of users while reinforcing the pedestrian-scale of the building.

3 Energy Efficiency and Resource/ Materials Conservation

Goal: *Configure and design the facility to optimize energy and cost efficiency by reducing non-renewable energy and resource consumption over the long term.*

Energy

Building design should aim for a 50% lower energy use than the model national energy code for buildings (MNECB).[12]

Designs should optimize the use of renewable energy sources such as solar heat, natural lighting and thermal storage, so that a minimum of 25% of building energy is provided by renewable resources or modified to retrofit at later date [13]. (solar technology may be one way to meet this target). The potential for ground source heating should also be considered as a renewable energy source for the building as well as the surrounding community, although potential impacts on water temperature for water treatment and discharge into Britannia Creek should be considered.

The building(s) should be sited and designed to maximize control of excess solar heat gain while maximizing day-lighting and visual access. At the same time, cooling and heating loads should be minimized while natural ventilation; air circulation and cross ventilation should be maximized.

Consideration should be given to how buildings and landscapes could accommodate additional alternative, energy-efficient technology over their life-cycle (for example, by allowing for the retrofit of roof structures to accommodate photovoltaic technology, or expanding stormwater, greywater systems to serve the surrounding community).

Materials[14]

The building envelope should be designed to be climate conscious with respect to long-term durability, maintenance, and energy efficiency. Designs should minimize the use of products with high-embodied energy to minimize non-renewable energy use and Green House Gas (GHG) emissions.

- Where possible, use locally sourced materials and those with low levels of processed components.
- Maximize the use of recycled / reclaimed / salvaged materials in building and site design without compromising other objectives. (Salvaged timber, engineered wood products, and steel are some options.)
- Maximize the use of durable, low maintenance materials and finishes in both indoor and outdoor spaces.

The adaptive reuse of existing structures on the site should be considered. This may include the consideration of historic structures related to the mine as outbuildings and / or as temporary or short-term housing for students, researchers and visitors.

Water Reuse

Design buildings and landscapes to maximize the potential to reuse stormwater runoff and rainwater volumes for non-potable uses such as landscape irrigation, toilet and urinal flushing and custodial uses (see also Ecological Infrastructure performance objectives).

4 Working Environment

Goal: *Design a healthy and enriching research environment that fosters public education and collaboration, innovation and learning for all users.*

Building and Site Program

Designs should consider the most appropriate relationships between indoor spaces (including research, office, exhibition, interpretive, and administrative functions) to optimize space efficiencies, foster a collaborative research environment, and maximize opportunities for observation and learning by the public. A variety of social spaces that bring users of the research centre together should be incorporated into the design of indoor and outdoor spaces.

Designs should also consider the relationship of the building (s) to the landscape and adjacent structures and the importance of these areas to the research function of the facility. The notion of the "working landscape" should be exploited as a way of integrating research into outdoor spaces and thereby expanding the research scope of the facility.

Occupant Health and Well-Being

Human comfort, fulfillment, and safety should be optimized in the design of both indoor and outdoor areas. This includes, but is not limited to, the following considerations:

- Access to fresh air and daylight should be maximized through siting, massing, architectural form, and interior design.
- Building methods and materials should minimize health risks to occupants.
- Spaces should optimize flexibility and adaptability and allow for user-controlled components where possible.

Public Education and Ecological Revelation

Designs should maximize visual and physical connections to exterior spaces, exploring strategies for engaging the building with the site and for maximizing opportunities for public education and environmental learning. The material, tectonic and symbolic dimensions of the site and building should be exploited as sources for communication, education, and interpretation.

[1] The SLRD "Electoral Area D Official Community Plan Amendment Bylaw No. 714, 2001 (Bylaw 714) provides the land use planning context for new development at Britannia Beach. It outlines broad goals for directing future growth in a manner that respects and capitalizes on existing environmental, social and cultural attributes and constraints and provides the policy direction for achieving sufficient amenities and facilities to satisfy the needs of the existing and future residents of Britannia Beach.
[2] SLRD Bylaw 714, Policy 2.11 – "Natural Hazards"; Policy 2.12 - "Environmental Contamination".
[3] SLRD Bylaw 714, Policy 2.8 – "Infrastructure, Stormwater Management" Guidelines.
[4] SLRD Bylaw 714, Policy 2.3.5 - "Parks and Open Space", encourages the retention of existing vegetation in open spaces and environmental restoration of land previously disturbed.
[5] See Schedule B, Howe Sound East Sub-Area 3 Plan (Britannia Beach Land Use Plan).
[6] SLRD Bylaw 714, Policy 2.5.9 - "Commercial" states that all commercially designated lands are designated as development permit areas for the purpose of establishment of objectives and development of guidelines for the form and character of commercial development.
[7] SLRD –Bylaw 714, Section 3.0 - Development Permit Area Guidelines, recommends that in the Britannia town site area tourist commercial buildings should use historic elements consistent with an industrial, small settlement heritage.
[8] SLRD Bylaw 714, Policy 2.9.3 - "Environmentally Sensitive Areas" encourages the enhancement of environmental resources in environmentally sensitive areas and throughout development areas through community education and stewardship initiatives.
[9] SLRD Bylaw 714, Policy 2.3.1 recommends an area of between 1 – 1.5 hectares (2.2 to 3.5 acres) for a Britannia North community park and stipulates that flood management be incorporated into its design. Policy 2.3.4 recommends a pedestrian link between the shoreline of Howe Sound and the Britannia North frontage.
[10] SLRD Bylaw 714, Policy 2.7 - Transportation Guidelines.
[11] SLRD Bylaw 714, Section 3.0 Development Permit Area Guidelines, recommends large surface parking areas be minimized, that they be adequately set back and screened from adjacent buildings with vegetation, and that shared access to compatible uses be provided where practical.
[12] 2 The federal Commercial Building Incentive Program (CBIP) energy efficiency threshold is 25% below a design minimally compliant with the Model National Energy Code for Buildings (MNECB). Currently, Green Buildings BC pilot projects are targeted towards meeting energy targets 50% below a minimally compliant building. See Performance Targets for Pilot Projects Green Buildings BC - New Buildings Program, "EnergyTargets" 2000.
[13] Performance Targets for Pilot Projects Green Buildings BC - New Buildings Program indicates between 0 - 25% total energy derived from renewable energy source as "innovative" while 25% or greater is identified as "excellent."
[14] 7 See Goal 7.6, "Green Products and Materials", Planning, Design and Construction Strategies for Green Buildings. Green Buildings, BC. 2001.