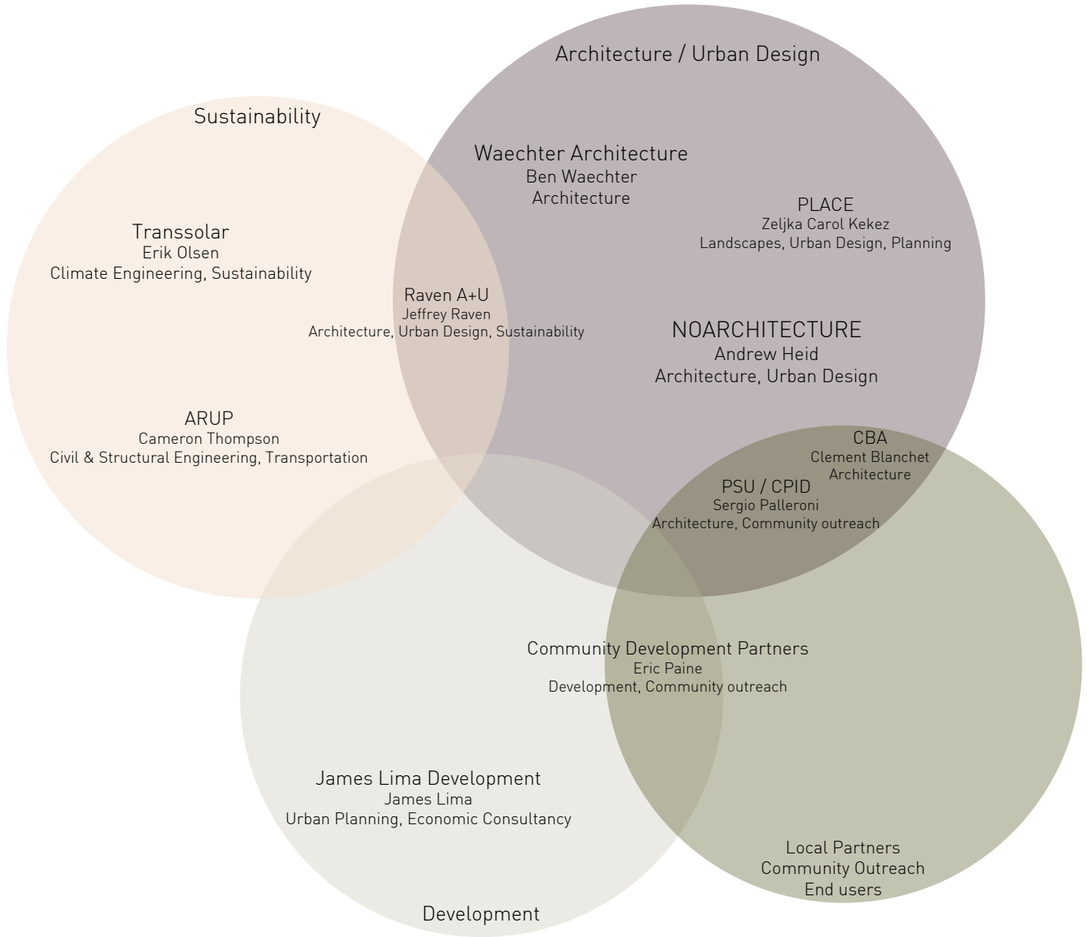
We begin each project with a single question: How can we take the best from nature and urban life and connect them?



Site of the competition your team is bidding for:

INNOVATION HUB, Vancouver, B.C., Canada

Name of the project team:

NOA

High Ground

Toward an Eco-Social Topography

1. Vision
2. Site + Context
3. Phasing
4. Life Outdoors
5. Life Indoors
6. Ecological Response.

VISION.

PUBLIC ENGAGEMENT FOR A NEW ECO-SOCIAL TOPOGRAPHY.

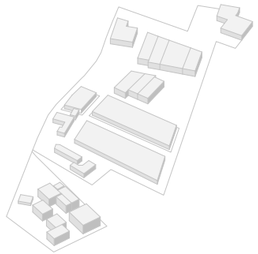
This project builds upon Vancouver's rich heritage of visionary urbanism; from 1929's Harland Bartholomew Plan to today's Greenest City 2020 Action Plan. From establishing the Agricultural Land Reserve to voting The Elector's Action Movement (TEAM) into power, these frameworks have laid the foundation for Vancouver's innovative culture of civic development and planning, now recognized around the world. In solidarity with the region's history of citizen-led movements, our project continues the tradition of "Vancouverism," and likewise, will place the empowerment of individual citizens and their communities at its heart.

This legacy provides a framework for promoting citizen engagement and participation, which we believe is the key to not only the health and well-being of cities, but also to a climate positive and resilient urbanism that is sincere, authentic, and innovative. The highest ideals of these efforts, however, have rarely been realized at the scale of architecture, much less human-centric design at the scale of the urban experience. Therefore, we propose to reverse the conventional process for designing urban development.

Bottom-up, instead of top-down, we propose a participatory co-design process as our team's core methodology from day one. Grounded in fieldwork and dialogue, public engagement will nurture the evolution of the site into a new typology that is socially conscious, environmentally sustainable, and economically accessible to all.

With an emphasis on equity and resilience, the site will evolve into **High Ground**: a new eco-social landscape framing the conditions for a model of urbanism that is inclusive and self-organizing. The site's defining spatial logic will be an architecturally-defined topography of outdoor living spaces or agoras, diverse in both scale and geometry, optimized to support a full spectrum of community-driven programs. All-day and year-round, a verdant microclimate for public assembly will be achieved in a verdant horizontal and vertical proliferation of cascading terraces woven around mass timber towers sculpted to optimize both solar access and natural ventilation.

Under the threat of climate change, the optimistic urbanism at **High Ground** will be a living showcase and celebration of the latest advances in not only green infrastructure and passive design, but also social organization. This includes proposing solutions to the popular perception that the people who live and work in Vancouver can no longer afford to live there. Through a participatory co-design process, **High Ground** will develop and test new typologies for affordable housing—prioritizing a commitment and close collaboration with First Nations. Facing the continued repercussions of both colonialism and industrialization, this project aspires to heal past generations' mistakes. Rather than demonstrate how much we can extract and profit from the land, **High Ground** will be a living display of how we must act as stewards, not masters of the Earth; a collective celebration of humanity's interdependence with nature; a perpetual exhibition of the most recent technological and social advances towards a carbon neutral, climate positive future.



EXISTING CONDITION
· Original buildings on the site

SITE + CONTEXT.

INTERSECTIONS

Located on a flood plain, **High Ground** will rise from a 0.6ha site within the 3.7ha Innovation Hub, which is embedded along the western edge of the even larger vision of False Creek Flats. The ribbon-like site is partitioned into three parcels: B-1 along Main Street, H-1 across Western Street, and H-2 along Station Street, which forms the eastern boundary. Within the given and rigorously defined zoning requirements and guidelines, a tension emerges between competing desires for a fine-grained urban fabric and large floor plates for industry, commerce and retail.

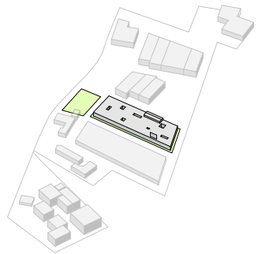
The site's unique potential lies in unleashing its multiple intersections, both spatial and social. It is well-suited to become a meeting ground at the confluence of urban conditions: industrial, residential, and academic. Connections for pedestrian and cyclists as well as uniting diverse demographics into a coherent community are priorities.

PHASING.

YEAR 1

IMMEDIATE ACTIVATION

Aligned with Vancouver's Transportation 2040 plan, an initial priority is introducing a finer-grained circulation to the site, opening the site to pedestrians and cyclists. While ensuring continuous operations for current tenants, we will invest in architectural upgrades to the existing production space. Like acupuncture, a pinpointed network of excavated courtyards, skylights and glass-walled alleyways will stream through the warehouses, showcasing the work within. Simultaneously, operators on our team will immediately activate the roof into a mosaic of bold interim solutions that preview **High Ground**'s future.



YEAR 1
· Adaptive reuse of existing warehouses with inserted/excavated public realms

Art Installations + Performances.
Resonating with the planned "Arts Walk" between First and Second Avenues, our curatorial partners at Jerome Sans will design a year-round contemporary art program to preview their future permanent facilities. Throughout the entire public realm, experimental installations and performances will animate the site; and at night, a billboard-size screen will project video art and cinema along the skyline.

Multi-Use Sports Facility.
Operated by Le Five North America, an air-supported bubble will shelter indoor soccer fields that convert into tennis, paddle, and basketball courts.

Bio-Material Exposition.
Young artists and architects will be invited to partner with bio-material manufacturers to produce innovative installations and pavilions.

Greenhouses:
The future Food Centre will be anticipated by rooftop aquaponics.

Photovoltaic Arrays.
On-site power generation will begin with roof-mounted PV fields.

SITE REVEGETAION

At B-1, demolishing the car dealership will allow our landscape architects to deploy an ideal mix of plants and microorganisms to de-contaminate industrial toxins. Pervious surfaces will replace all hardscapes. To prevent liquefaction, the site will be prepared with piling and ground densification to ensure future buildings are seismically stable. Routes for pedestrians and cyclists will extend Central and Southern Streets to Main Street, where Mobi bike share facilities will be available.

MASS TIMBER PAVILION

Serving as a stage for fundraisers and community outreach, the revegetated lot will feature a temporary architectural pavilion that showcases modular mass timber construction. The pavilion is well-suited to host concerts, pop-up markets, and community outreach for our operators and neighbors from day one. Here, the public will test prototypes of furniture tailored for working outdoors with the support of free Wifi and solar-powered charging stations.

YEAR 5

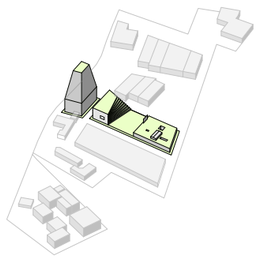
TOPOGRAPHY RISES

Phased site revegetation, decontamination, and seismic stabilization expands incrementally to the “Central Mews,” where the wide plaza is conceived as a valley. The accompanying partial demolition of existing production space proceeds once the new Creative Hub annex opens in parcel B-1. Above a 22m-high plinth of vertically stacked production spaces, a modular mass timber tower features a mix of experimental co-working and -housing typologies, including over 6,000m2 of social housing. Rainwater harvesting, greywater recycling, and two-stream waste systems are fully operational, while respective educational field stations open to academics and the public.

After extensive on-site community engagement, prototypes for First Nation affordable housing open at H-1 above the centrally sited Centre of Food Excellence, whose community commons anchors the “Central Mews.” Undulating paths and stepped terraces lead pedestrians, runners and rock climbers to the expansive public roof. Here, ample room supports not only work and play, but also greenhouses servicing the Food Centre and a potential synergistic showcase of indigenous agriculture and land stewardship. The architectural landscape, furthermore, reveals site-specific curatorial possibilities for art programming.

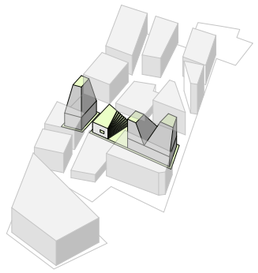
WORKING STREET

Between the completed B-1 and H-1 parcels, a “Working Street” enlivens a ground plane raised 4.6m for flood protection. Southern Street is consequently re-graded to slope down to meet Station Street, where the remaining retrofitted warehouses continue operations. Along both Western and Southern streets, industrial facades with roll-up doors and foldable storefronts open out onto wide pedestrian promenades conceived as continuous “loading docks” with bioswales for flood mitigation. A mix of cantilevered arcades, translucent glazed canopies and adaptable trellises allow rain-friendly pedestrian corridors, sheltering café seating, outdoor performances, and consistent conviviality. With numerous perimeter access points, the architectural topography carves a porous border, and prevents **High Ground** from becoming a self-isolated island.



YEAR 5

· Demolition of H1 · Site revegetation
· B2 houses the Creative Hub



YEAR 10

· New context around the site
· Network of 3D streams connecting building and public space

YEAR 10

DENSITY ACHIEVED

The eco-social topography flows across the entire site, extending through H-2, where over 8,000m2 of stacked production spaces supports a tower sculpted to block winter winds. Initial prototypes for co-working and -housing are refined to include a broader mix of affordable microunits and live/work studios. In addition to fulfilling the mature floor space requirements for the Creative Hub, Food Centre, and their collaborators, the final development at H-2 includes:

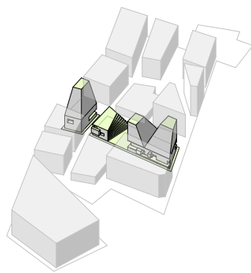
Ecological Art Center.
Anchoring the Central Mews to the west, a 740m2 enclosed gallery offers a permanent home for our curators who will also begin managing a fabrication lab in addition to the outdoor art program. Dedicated to the intersection of aesthetics, ethics, and activism, this groundbreaking center promotes ecological art, an emerging genre that seeks to vitalize and preserve the Earth’s life forms, resources and processes. The center amplifies **High Ground**’s holistic approach to sustainability and allows internationally-acclaimed artists and local artists and students to share ideas and resources.

Eco-hotel.
Operated by Light Human Hotels, an energy-positive boutique hotel provides out-of-town guests to experience a lifestyle outfitted with the same sustainable systems and amenities as the housing units.

YEAR 50

NETWORKED HABITATS

Evolving economies and community needs require building interiors be converted from office to residential use, or vice versa. With modular mass timber components, these renovations are cheap, easy, and fast, while the structural lifespan endures another fifty years. More efficient models replace roof-mounted PV arrays, and surplus energy is exported. A revegetated Station Street closes to all automobiles, including autonomous ones, except for deliveries. Along with Central Street’s transformation into a daylighted stream, the urban fabric’s landscape matures into restored biotopes and networked habitat corridors, supporting bird migration and pollination.



YEAR 50

· Landscape matures into an urban forest

LIFE OUTDOORS.

ECO-SOCIAL TOPOGRAPHY

Rather than view parkland as an escape from the urban condition, High Ground will assert public green space as the development's core element. The circulation condition exemplified by Vancouver's iconic Seawall will thread an undulating public realm through, around, and over a plinth of vertically stacked loft-like warehouses. Synthesizing the site's industrial and ecological heritages, workspaces will spill out onto a cascading series of verdant terraces and mezzanines oriented towards Central Street's greenway and the central plaza anchoring the Mews. Further showcasing the light-industrial lofts and the activity within, the public will gaze from multiple and surprising angles through glazed facades, clerestory windows and skylights that punctuate the lush landscape planted with native flora. Contemplative bowers of Yellow Cedar and Douglas Fir will abut functioning aquaponic greenhouses. Stepped amphitheaters will host experimental performance art and activist rallies. Through an amplified social dimension, High Ground will advance Vancouver's tradition of the West Coast Vernacular embodied at Arthur Erikson's masterpiece, Robson Square, or more recently, the Convention Center's "living roof." With continuous pedestrian access, all-day and year-round, this diverse, locally-rooted topography will define places to gather and build community not only for High Ground's office tenants and residents, but also the city at large.

Preparedness for hotter, drier summers and the Urban Heat Island effect will directly shape High Ground's built form. The fine-grained urban fabric and network of outdoor spaces will be configured for self-shading and natural ventilation in summer and protected from winter winds. Since increasing the degree of roughness or irregularity in a city's fabric stimulates cooling breezes, potentially reducing urban heat by about 2 to 3°C, all buildings will be strategically textured by cantilevered terraces, rotated floor plates, and roof gardens. While providing shade, deciduous canopy coverage will further alleviate heat through photosynthesis and evapotranspiration, impacting perceived temperature by as much as 5 to 10°C cooler.

RESILIENCY HUBS

For residents as well as neighboring communities, this topography will serve as a resiliency hub and evacuation site, providing not only cool shelter during heat waves, but also backup electricity and charging stations during power outages via on-site solar arrays. The Centre for Food Excellence, urban farms and community gardens will further aid resiliency with on-site food production. Through this eco-social topography, High Ground will prioritize the public realm, and thus, contribute an additional dimension of emergency preparedness—social connectedness—since when members of a community are regularly involved in each other's lives, they are more empowered to help each other when in need.

LEARN

The built environment at High Ground—defined by mixed-use space, flexible buildings, and green infrastructure—means that learning will occur in places not traditionally dedicated to classrooms. Formal learning will become embedded throughout the public realm and tailored to the needs of students, educators, and employers. Education will occur inside and outside the contemporary art center, urban farms and sports facilities—spreading throughout the abundant common green space which will become a living lab. From cradle to career, High Ground will support lifelong education.

Integrated into High Ground's state-of-the-art green infrastructure, the component systems (modular mass timber, water + waste management, urban agriculture) will be associated with dedicated field stations, each coordinating critical research and outreach programs such as educational tours. Addressing the divide between low-income and wealthy families with resources to supplement formal schooling, these field stations will supply extracurricular classes and internships to students who have fewer connections to such opportunities.

OUTDOOR DESKS

Outdoors, a commitment to the shared economy will extend throughout High Ground's public realm, which will be optimized for working in public. High Ground will redesign the conventional picnic table to accommodate independent workers as well as business meetings and workshops; creative design and fabrication; continuing education and community organizing.

With universal Wi-Fi coverage and solar-powered charging stations, these optimized work tables will be as ubiquitous as outdoor benches. A mobile app will deploy a reservation system with OpenTable as a model. The outdoor workspaces will be available not only for High Ground's tenants, but also the surrounding community free of charge.

OUTDOOR CLASSROOMS

Achieving a comfortable outdoor microclimate allows for outdoor furniture to also be intentionally designed and configured into outdoor classrooms, which will be similarly bookable free of charge to the surrounding communities. This strategy is in addition to the park space that can be reserved by the many local gyms and yoga studios for outdoor fitness classes. In addition to abundant informal and unconventional venues, an outdoor amphitheater will be available for performances and lectures, serving the on-site contemporary art center, creative hub tenants, and artists from all over the region.

MOBILE APP

Like all flexible real estate at High Ground, these spaces will be bookable and programmed via mobile app to share availability. This will allow for the intelligent activation of spaces chronotypically; for example, the contemporary arts center, which like all museums will be traditionally less busy during early morning hours will be bookable by teachers from the surrounding public schools.

In addition to an online reservation system, the mobile app will help High Ground track user preferences and analyze supply and demand for public amenities as the development matures. The resulting database will be an open resource made

available to planners of future projects around the world. Data privacy will be honored by providing permission controls for every user ID, as well as the option to use the app anonymously.

LIFE INDOORS.

PARTICIPATORY DESIGN

From day one, we will listen to community needs and expectations. Targeted for cultural, economic, and generational diversity, local residents from the surrounding neighborhoods will play an active role in both the research and design phases. Initially, Sergio Palleroni and his team at Portland State University's Center for Public Interest Design (CPID) will use interviews and community charrettes to investigate and articulate key issues facing local communities. Throughout the design process, our architects and urban planners will engage future residents, tenants, and their neighbors in formalizing needs and envisioning future benefits. This bottom-up process will be essential for defining the appropriate mix of housing typologies, such as micro-units, live/work studios, affordable rentals and market-rate condominiums. Investing in the shared economy, we will also work with the community to develop context-specific co-living and co-working solutions.

AFFORDABLE HOUSING + FIRST NATIONS

Although among Kwakwaka'wakw-speaking peoples, it is said that "the house holds the tribe in its hands," due to colonial dispossession and relocation, the indigenous of the Pacific Northwest largely abandoned housing traditions by the early twentieth century. From a need to restore traditional economies and reclaim cultural identity, there has been however, a revival of longhouse construction by coastal First Nations such as the Qua'utsun of southeast Vancouver Island and the Gitanyow of upper Skeena. Nevertheless, there has been no return to traditional housing.

Through an inclusive process and participatory design, CPID will engage First Nations' in an authentic dialogue, which may or may not explore the translation of housing typologies and practices to fit contemporary expectations and needs; which may or may not result in new and vernacular affordable housing prototypes; which may or may not establish continuities between the communal life within plank houses and the emerging market for co-living options.

CO-LIVING

In order to grow a diverse community that is both resilient and equitable, **High Ground** will offer housing designed to advance co-living housing options tailored to the specific needs of not only First Nations, but also students, young workers, single-parent families, and seniors. While residents rent either private rooms within shared apartments or their own private units, they share spaces, events, and utilities.

Residents are offered flexible contracts and all-inclusive bills with no additional fees for internet, bi-weekly cleaning, laundry facilities, gym access, and well-designed communal leisure and work spaces.

Student Population.
With an attractive price and useful services, we will establish partnerships with nearby academic institutions. In under 10 minutes, a short walk connects to the Great Northern Way Campus, while an 8-minute commute on the Expo Line arrives to the many campuses located Downtown.

Young Workers + Entrepreneurs.
In addition to quick connections to surrounding commercial districts, **High Ground** will grow its own local economy with an emphasis on green start-ups and B corporations, whose entrepreneurs and employees will have the opportunity to walk to work and share living costs.

Single-parent families.
Addressing the challenge of affordable child-care, **High Ground** will offer daycare as a shared amenity to support working parents.

Seniors.
Retirees and empty-nesters are offered a convenient path to downsizing without sacrificing easy-access to amenities and community.

CO-WORKING + INCUBATORS

High Ground will offer hybrid co-work spaces designed specifically to incubate non-profits and businesses positioned to collaborate with the Creative Hub and Food Centre. Naturally illuminated and ventilated, open-plan workspaces will offer desks and private offices for rent, while premium amenities such as kitchens, showers, and common lounges will be available to all tenants. In addition to providing physical workspace, incubators dedicated to green technology and community services will support the growth of emerging companies by providing a menu of services, including financing, legal, marketing, operations, as well as training and access to investment.

B Corporations.
Certified by the nonprofit B Lab to meet rigorous standards of social and environmental performance, accountability, and transparency, **High Ground** will concentrate like-minded B Corps to bolster community impact.

Micro-businesses + Freelancers.
Increased flexibility and lower overhead costs, combined with the ease of leasing coworking space, will attract those without the resources for real estate and facilities management.

Artists + Designers.
In addition to community exhibition spaces, those working in creative fields will have access to an art fabrication facility at the district's contemporary arts center operated by EURL Jérôme Sans.

Green Technology Startups.
A natural extension of **High Ground**'s green infrastructure—modular mass timber, waste + water management—includes incubating startup companies interested in extending these fields.

SEDUCING CIRCULATION

Promoting active lifestyles requires designing compelling circulation routes that become destinations in themselves, like Rome's Spanish Steps or Vancouver's

Robson Square. Within buildings, those able to bypass elevators will be encouraged to follow staircases and ramps arranged in playful architectural processions. Liberated from the structural core, service and emergency stairs along building perimeters will be naturally ventilated and illuminated. At night, neon signs will illuminate paths indoors and outdoors in polychrome constellations, resurrecting a local tradition.

ECOLOGICAL RESPONSE.

MODULAR MASS TIMBER

British Columbia is at the forefront of foresting and engineering sustainable wood-products such as cross-laminated timber (CLT) that is treated to be more dense and fire-resistant than previous wood construction. High Ground will turn to this locally-sourced, renewable resource as an alternative to conventional steel and concrete construction, which accounts for an estimated 10 percent of global greenhouse gas emissions. High Ground will advance British Columbia's leadership in this growing movement by utilizing CLT panels in modular configurations across all new construction, both residential and commercial. Modular interior fittings and façade modules will allow buildings to be flexibly reconfigured over time as user needs evolve. With components that can be interchanged and recycled, modular mass timber construction increases the functional lifespan of buildings while reducing material waste and carbon emissions. Although not required by law, all manufactured wood products will be sourced according to the sustainable harvest standards established by the Forest Stewardship Council.

Since it is a matter of when, not if, the Cascadia subduction zone earthquake hits the Pacific Northwest, High Ground's modular mass timber construction will undergo start-of-the-art seismic testing and implement recent advances in self-centering post-tensioned CLT rocking-walls. Testing will be performed at standards that not only ensure life-safety needs, but also building reoccupation following a major earthquake. This is in addition to mass timber's advantages of fire-resistance, and more efficient repairs through modular components.

NEU SYNERGY

Similar to the Southeast False Creek Neighborhood Energy Utility (NEU), several projects within Transsolar's portfolio demonstrate their expertise at engineering thermal grids, which replace steam with water as the heat exchange medium: including the utility systems at Portland State University, Clemson University and Iowa University. At High Ground, key strategies will involve: reducing heating load to minimize the impact on the existing utility system; low-exergy heating systems to allow low-grade return heat from NEU, and direct heat rejection into NEU from the cooling intensive spaces.

HYDRONIC SYSTEMS

At the scale of a room, Transsolar has developed an innovative hydronic heating/cooling technology—the Radiant Wave—with almost two times more capacity than a suspended radiant panel system due to the increased convection from the wave-like profile. This Radiant Wave technology will be immediately implemented across affordable and market-rate housing. Domestic hot water will be heated geothermally and augmented by solar thermal collectors.

TWO-STREAM WASTE MANAGEMENT

Food waste accounts for the largest portion, or forty percent, of the garbage Vancouver sends to landfills, where it releases methane and exacerbates global warming. In addition to Vancouver's 2015 ban on food scraps, the city is currently alleviating the situation by collecting food scraps for conversion to energy and fertilizer. High Ground will advance the Vancouver's resource recovery efforts by installing organic-waste disposal units in every office and residence. Across the district, a two-stream waste system will conveniently separate organics and recyclables.

RAINWATER HARVESTING + GREYWATER RECYCLING

Efficient water management will be achieved through two strategies: rainwater harvesting and greywater recycling. Rather than channel rainwater into storm sewers, High Ground will first mimic the ways natural areas absorb this increasingly scarce resource. Rooftop rain gardens, permeable public plazas, bioswales and detention basins will integrate into a rainfall-capture and flood-prevention system. Second, Transsolar will leverage their expertise to design a two-stream water system which serves potable and non-potable uses separately. The lower purification requirements for toilet water and washing machines, landscape irrigation, industrial purposes and cleaning will save energy and reduce waste. By recycling rainwater and wastewater as clean but unpotable greywater, High Ground consumption on public water supplies will be 50% less than at comparable high-density, new-build districts.

TECHNOLOGY + TYPOLOGY

All buildings will be equipped with highly-insulated envelopes, triple-pane glazing with inert gas filling, and seasonal heat storage via an architecturally-integrated passive thermal storage system. The ventilation concept will include earth ducts to precondition fresh air supply, and exhaust chimneys to extract used air by a natural stack effect. High Ground, however, will not only integrate and enhance technological innovations, but also propose new spatial typologies that realize passive heating and cooling through architectural form itself.

Our ancestors adapted to diverse climates and geographies, achieving today's comforts, the efficiencies of prefabrication and standardized building components, without a destructive reliance on fossil fuels. At High Ground, new multi-use building typologies will emerge from time-tested, climate resilient forms: ventilated courtyards, shared walls, stepped terraces, wind towers, and arcades. These replicable typologies will demonstrate how passive design strategies from the past and present can be translated to serve the accelerating scale and density of urban centers in the 21st century.


CO-LIVING

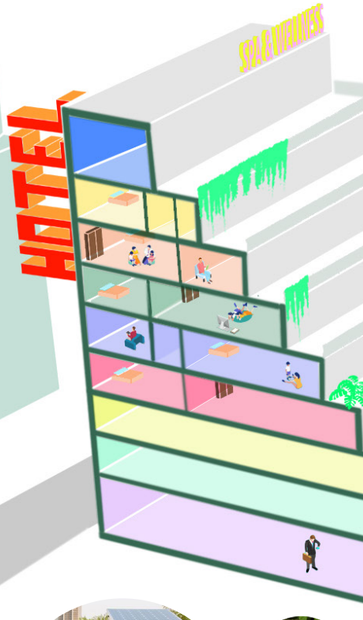

CANOPY
COVERAGE


GREEN TERRACE


CO-WORKING SPACE


NATIVE


SUSTAINING


SPA VIEWING
HOTEL


ECOLOGICAL
ART CENTER


COWORKING
artists residence


OUTDOOR
WORKING SPACE


OUTDOOR THEATER

ART RESIDENCE