

**Cultivating Landscape:
A Demonstration Farm in
Rouge National Urban Park, Ontario**

by

Thomas Villiger

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ABSTRACT

This thesis addresses the role of architecture in the design of large parks, and the role of landscape in the design of architecture. Given the scale of national parks and their importance to national identity and imagination, how might their design achieve legibility and enhance the experience of place, while simultaneously proposing a new space of public engagement? Underlying the thesis is a commitment to occupied, productive landscapes, and the ability of architecture to act as interface between the public and processes of production.

The study site is the proposed Rouge National Urban Park, located on the eastern edge of the City of Toronto, Ontario; in particular, the design site is the agrarian hamlet of Locust Hill. At the landscape scale, overlaid regional systems serve as organizing principles of the park. At the building scale, landscape is actively constructed to host program, and yield produce. At the human scale, materials engage site history and environmental conditions.

ACKNOWLEDGEMENTS

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To my family – I could have not completed this program without their support.

CHAPTER 1: INTRODUCTION

The Landscape Image



Landscape as image. Banff National Park (Orange Girl Photographs 2015).

The national park occupies a particular place in the imagination of Canadians. For many, it exists as the image of sublime nature, perhaps most dramatically represented by the Rocky Mountains of Banff National Park, Alberta. In a discussion of landscape and representation, James Corner (1999) notes the inseparability of image and landscape, for the image makes possible the recognition of land as landscape. He draws historical distinctions between *landskip* (Dutch tradition) – landscape as pictorial image – and *landschaft* (German tradition) – occupied landscape, arguing that viewing landscape as an aesthetic object signifies escapism, for “the viewer is allowed to momentarily forget and escape from present and future difficulties, finding compensation in the recollection of earlier, ‘simpler’ times. The net effect is personal withdrawal and nostalgia for the presence of the past, both of which are rooted in an aestheticized – rather than a productive, useful, or engaging – landscape experience” (Corner 1999, 156). Corner’s argument is similar to that presented by William Cronon (1996), who claims that defining wilderness as non-human territory allows people to excuse themselves of responsibility vis-à-vis present environmental destruction. Of no surprise is that wilderness is enjoyed recreationally by wealthy urbanites, rather than those who directly interact with the land for their livelihoods. By locating wilderness out there, rather than in the ground we inhabit, we are able to continue our irresponsible practices without pause. Cronon (1996) writes, “[t]he wilderness dualism tends to cast any use as ab-use, and thereby denies us any middle ground in which any responsible use and non-use might attain some kind of balanced, sustainable relationship” (85).

This thesis aims to locate the middle ground of responsible use, and, by extension, engagement and commitment, by focusing on the occupied landscape. As such, Rouge National Urban Park (RNUP) will be located between two poles on the park spectrum: first, the Canadian national park, understood as an area devoid of humans, and, secondly, the urban park, understood as an actively designed area for human occupation and enjoyment within the city. Rather than present the park as a non-human place, I propose that it can both accommodate and benefit both human and non-human entities simultaneously. The recognition of landscape as a special human construct allows for its active design and modification.



National Park of Canada

Rouge National Urban Park

Urban Park

Locating Rouge National Urban Park between national park and urban park. Valley of the Ten Peaks, Banff National Park, AB (Shed Expedition 2015). Sheep Meadow, Central Park, NY (RoundtripNuevaYork 2015).

Thesis Question

How might a reading of landscape lead to the development of an architectural strategy that cultivates an experience of place while providing space for participatory modes of production?

CHAPTER 2: THEORETICAL FRAMEWORK

In his seminal work, *The Production of Space*, Henri Lefebvre (1991) distinguishes between representational space, space of representation, and spatial practice. Together, these terms form a triad through which space can be understood and analyzed.

Representation of space can be understood as space produced through abstraction, through the imposition of conceived structures. As Luke Butcher summarizes, “[t]he representation of space is ‘conceptualized space, the space of scientists, planners, urbanists, technocratic subdividers and social engineers’ whom ‘identify what is lived and what is perceived with what is conceived’ and is the ‘dominant space in any society (or mode of production)’” (Butcher 2011). Within the Rouge watershed, these representations of space include the land survey grid, and the transportation system that defines it, both of which are described below.

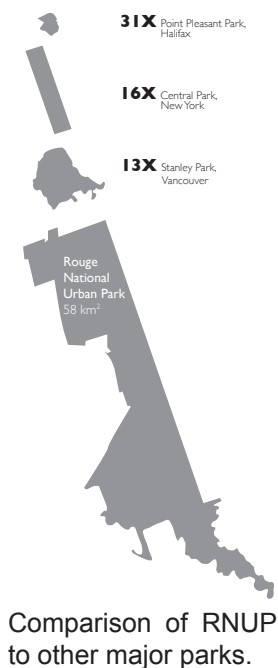
“Representational space on the other hand is ‘space as directly lived through its associated images and symbols, and hence the space of ‘inhabitants’ and ‘users’” (Butcher 2011). Rather than something imposed from above, representation space emerges from the bottom-up. It is the first-person experience of the world.

The third category – spatial practice – can be understood as the sets of activities that reproduce certain social relations. Michel de Certeau’s *Practice of Everyday Life* (1988) corresponds with this description. He distinguishes between two types of space-producing actions: strategies and tactics. Strategies are those practices employed by the governing structures of capitalist society as means of mass-control; tactics are the creative practices of individuals that work to subvert the strategies – the abstract space – imposed upon them. De Certeau sees walking as a deeply subversive act due to the unpredictability of the walker and his/her ability to move in-

dependently of the structures imposed (dominated space). Within the context of Rouge Urban National Park, small-scale farming can be understood as a spatial practice capable of subverting the abstract strategies of late capitalism. While land divisions are representations of space used to conquer and claim the land through private ownership, the proposed agricultural hub challenges these relations. Rather than individual, private landowners, farmers will be lessees of publicly owned land, working and living together. The attention required to successfully cultivate plants and animals in a particular area is considerable, in both human effort and expertise. The dedicated actions amount to transformative spatial practices, and the repetition of these practices over time comes to constitute the identity of the land in/on which they are performed. The expansion of human labour on the farm will also amplify the social and economic effects of these practices, thereby offering an alternative to social relations of the neighbouring suburbs.

CHAPTER 3: ROUGE NATIONAL URBAN PARK

Establishment



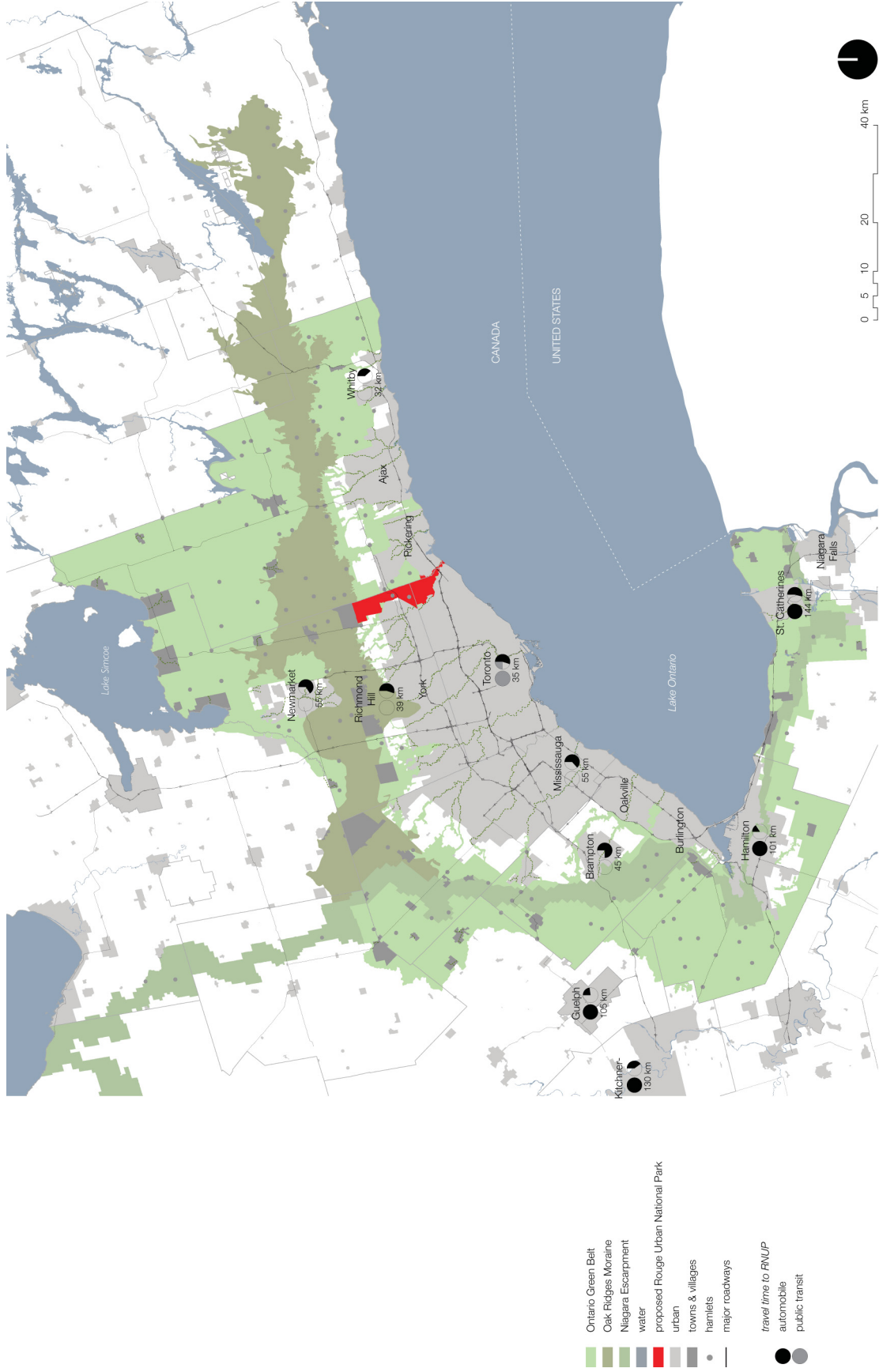
In its throne speech of 2011, the Government of Canada announced its intention to create Canada's first national urban park. Simultaneously national and urban, it offers a unique opportunity for defining the first of its kind. The proposed site is a fifty-eight square kilometer area located on the easternmost edge of the City of Toronto, Ontario. It straddles three separate municipalities within the Greater Toronto Area: the City of Toronto, Durham Region (Pickering, Uxbridge), and York Region (Markham, Whitechurch-Stouffville). The City of Toronto, in particular, is a uniquely multicultural city of Canada in the region, nearly half of whose residents are foreign-born (Statistics Canada 2011). Scarborough, the easternmost district of the City of Toronto with direct access to the park, is a destination of choice for many foreign-born newcomers to the city.

Rouge National Urban Park is being established for several reasons:

Population Base

The park will be within one hundred kilometers of approximately one fifth of Canada's population. The Greater Golden Horseshoe is currently home to more than eight million people (Statistics Canada 2011b) – a number that continues to grow. RNUP will provide these recreational and educational opportunities to these people, thereby enhancing public health and fostering continued interest and commitment to natural systems.

The large population base also affords Parks Canada a new financial and governance model. As stated in the *Draft Management Plan*, "[t]he creation of this National Urban Park is not simply a 'passing of the torch' that will see Parks Canada take sole re-



Locating Rouge National Urban Park (data from Ontario Ministry of Municipal Affairs and Housing 2005).

sponsibility for its heritage and future” (Parks Canada 2014a, 5). Instead, government, at various levels, community groups, and other special interest groups will provide input and effort to direct the park’s future, and private third-parties will be contracted to provide services within the park. I suspect that these will ease the federal government’s long-term financial commitment to RNUP.

Unique Ecology

The southern end of the Rouge watershed is the northernmost limit of the Carolinian life zone. This life zone, characterized by diverse, deciduous forests, covers less than one percent of Canada’s area, yet hosts more biodiversity than all others in Canada (Carolinian Canada 2015). It is found in southern Ontario, near the Great Lakes, which stabilize temperatures and make it habitable for many plants and animals, including rare and endangered species. Rouge Park (2014) notes that there are: 762 plant species, of which six are nationally rare and 92 are regionally rare; 225 bird species, five of which are nationally rare; 55 species of fish, two of which are nationally vulnerable; 27 mammal species; and 19 reptile and amphibian species. Given the high human population density of southern Ontario, much, if not most, Carolinian habitat has been destroyed. Continuous population growth in the region means increased threat to these areas and therefore necessitates the need for their further protection.

The unique ecology of the park depends on the health of the larger Rouge Watershed, of which it is a part. Water originates in the Oak Ridges Moraine, located north of the park, near Lake Simcoe, and drains to Lake Ontario in the south. The establishment of a national park here will contribute to its ecological well-being.

In *Large Parks*, Nina-Marie Lister (2007) distinguishes between reductionist and resilient-holistic understandings of ecology. In her

view, reductionist ecology is a view of nature as something static that can be measured, mapped, and predicted, and develops linearly from simple to complex. It can easily give rise to designer ecology, which involves mainly symbolic references to nature and fails to address and connect to deep ecological systems. Conversely, resilient-holistic ecology recognizes the dynamism and unpredictability of nature and advances adaptive rather than suppressive adaptation. It gives rise to operational ecology, which permits and facilitates the “emergence and evolution of self-organizing, resilient ecological systems – a basic requirement for long-term sustainability” (Lister 2007, 35). Underlying the operational ecology is an affirmation of human agency in the development of environments. Rather than consider some landscapes wastelands beyond repair, they can be understood as ecosystems in need of rehabilitation and direction. As such, operational ecology has become an important design principle of contemporary urban park design, as demonstrated by Field Operations’ plans for Freshkills Park in New York City (Pollak 2007). I propose that it be deployed in RNUP.

History of Human Occupation

The proposed area of RNUP has a rich history of human occupation, including the aboriginal Seneca, whose archeological artifacts can be found at Bead Hill National Historic Site, located near the Rouge Marsh. The Little Rouge River was part of the eastern portion of the Carrying-Place Trail, an important trade route connecting Lake Ontario with the Upper Great Lakes, bypassing the dangerous routes at Niagara Falls and Lake Eerie (Toronto and Region Conservation Authority 2007).

In *Making Ontario: Agricultural Colonization and Landscape Recreation before the Railway*, J. David Wood (2000) describes the transformation of the environment of Ontario. Prior to European settlement, the proposed park area was, similar to the rest of the

Land Survey Divisions

- municipal boundary
- roadway
- property division
- original settlement

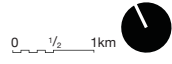
Infrastructure

- hydro line
- roadway
- - - railway
- bridge

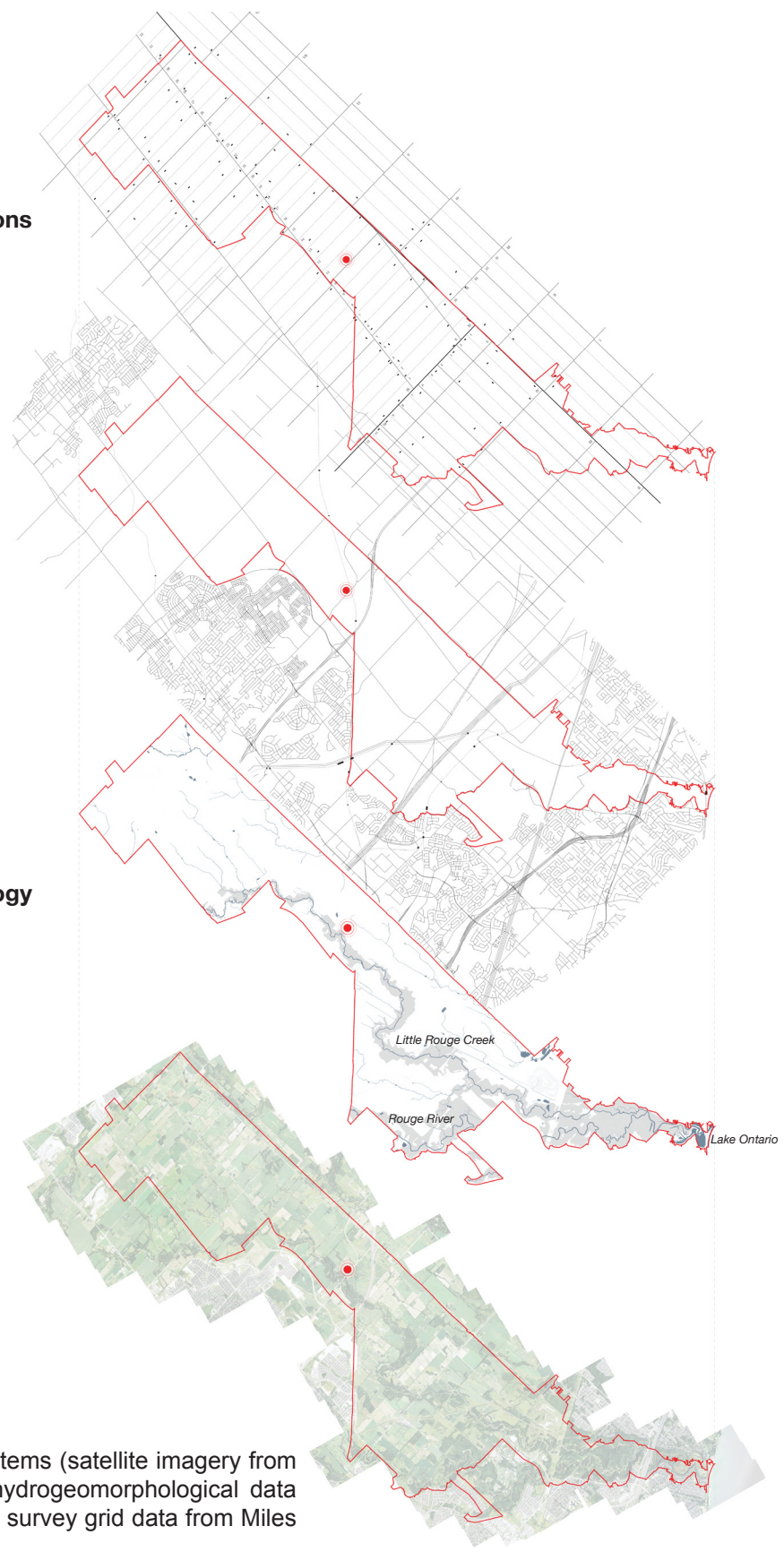
Hydrogeomorphology

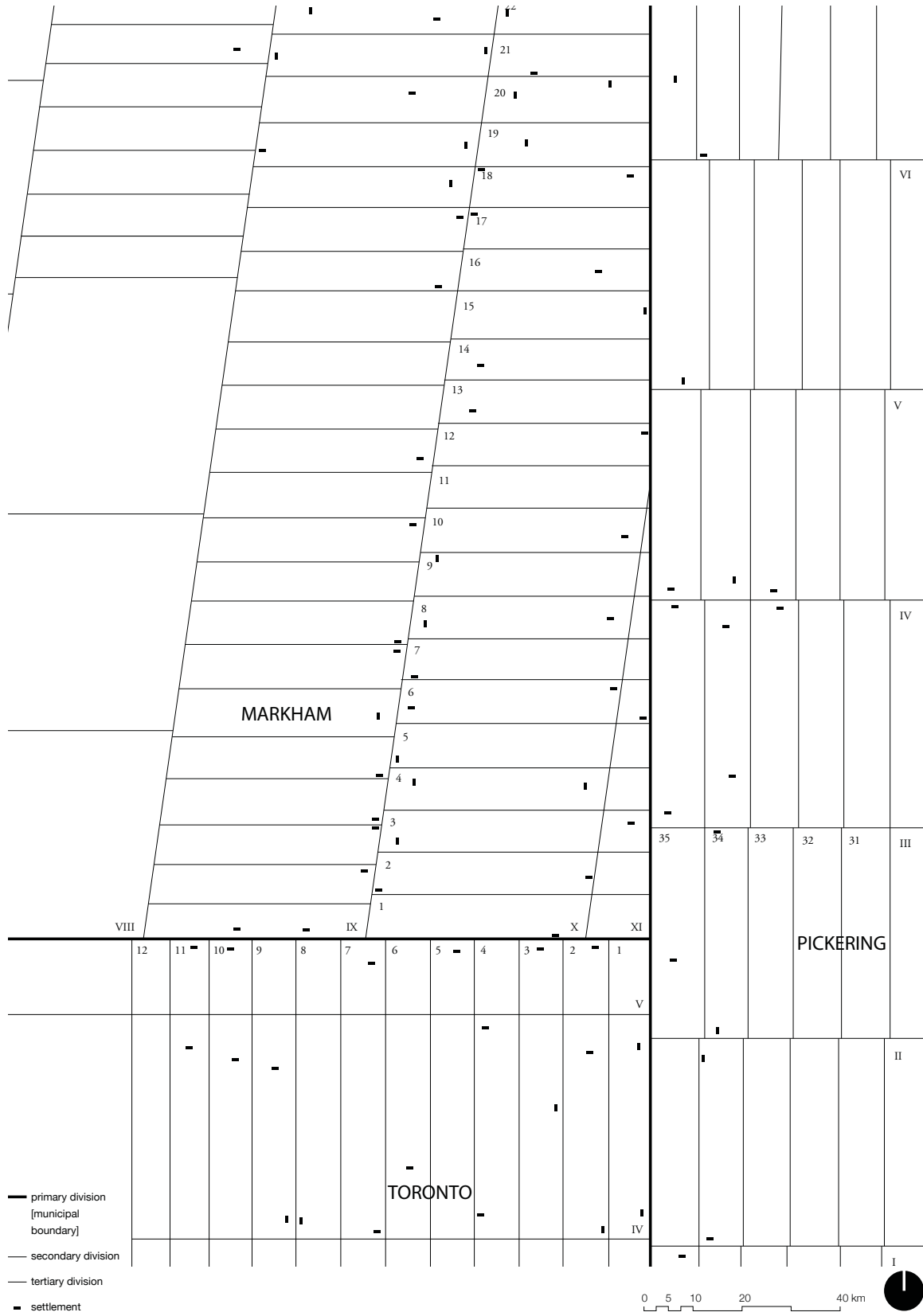
- primary waterway
- secondary waterway
- 1m contours
- riparian vegetation extents

- proposed park boundary
- Locust Hill



Overlaid Regional Systems (satellite imagery from Google Maps 2014, hydrogeomorphological data from TRCA 2014, land survey grid data from Miles & Co. 1887).





Land Survey Grid (1887) - intersection of Markham, Toronto, and Pickering (data from Miles & Co. 1887).

province, covered by mature woodland. European settlement brought drastic changes to the land in the form of deforestation, drainage of wetlands, hunting of animals, damming of rivers, and the introduction of foreign plant and animal species. By 1850, one third of the trees of southern Ontario had been felled, and by the First World War, this figure increased to over 90 percent (Wood 2000). Not only did deforestation make land available for agriculture, but timber also served as a building material and source of energy for heating homes and fuelling industrial processes, which in turn led to increased settlement and deforestation. Many water- and steam-powered sawmills, as well as gristmills and woolen mills were established on tributaries of the Rouge River. In fact, by 1861 there were already 54 mills (Toronto and Region Conservation Authority 2007).

Land Survey Grid

The creation of the agricultural landscape of southern Ontario was made possible by the survey grid – it was the abstract tool that defined the process by which it would take place. Laid down by the colonial government from the late 18th century onwards, it divided the land into small, rectangular plots of 200 acres (200 m x 4000 m). Oriented east-west in Markham Township, these private plots were bound by regular intervals of concession roads oriented east west, and meridians oriented north-south. Early settlements were located near the perimeter, along concession and meridian roads. Over time, these original plots were subdivided and parceled, thereby enabling a densification of countryside settlement.

This democratic grid can still be read from the landscape, both in urban areas – as principal roadways – and rural areas – as roadways, and as property boundaries marked by hedgerows and forest.

Existing Urban Infrastructure

The proposed site contains significant infrastructure, including major highways (the 407 and Canada's busiest, the 401), local roads, bridges, railways, hydro lines, towns, villages, and hamlets, and numerous farms. In addition, it contains traces of past human activity in the park, including the now retired Twyn Rivers Ski Hill, and is directly adjacent to the retired Beare Hill Landfill. Rather than a place, the site is, for most, a time of transit between places of employment within the City of Toronto and residences in the GTA. Even if views of the surrounding urban fabric are blocked while in the park, the distant hum of automobile traffic remains.

Dwelling

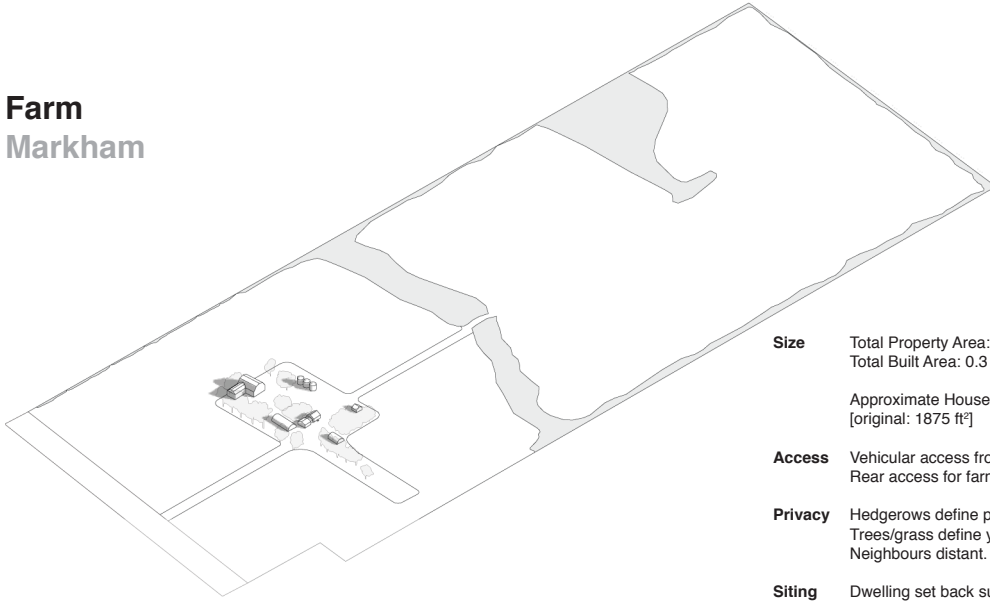
Settlement patterns have changed considerably over the years. A comparison of dwelling on the farm, in the hamlet, and in the suburb shows a decrease in land area, yet an increase in built area.

A map of Markham Township in 1878 (Miles & Co) shows private orchards accompanying most settlements. This demonstrates both the possibility of fruit production in the area, and also the necessity of producing one's own food for survival in the harsh climate and newly developing settlement.

Economy

As noted above, small-scale, family-based agriculture was the primary occupation in the period of first European settlement. The destructive effects of Hurricane Hazel, which hit the area in 1954, lead to the expropriation of farmland by the provincial government to mitigate future risk. Today, provincial ownership constitutes approximately one third of the proposed area of RNUP. In anticipation of the need for a second major airport to service the Greater Toronto Area, the federal government expropriated over eighteen thou-

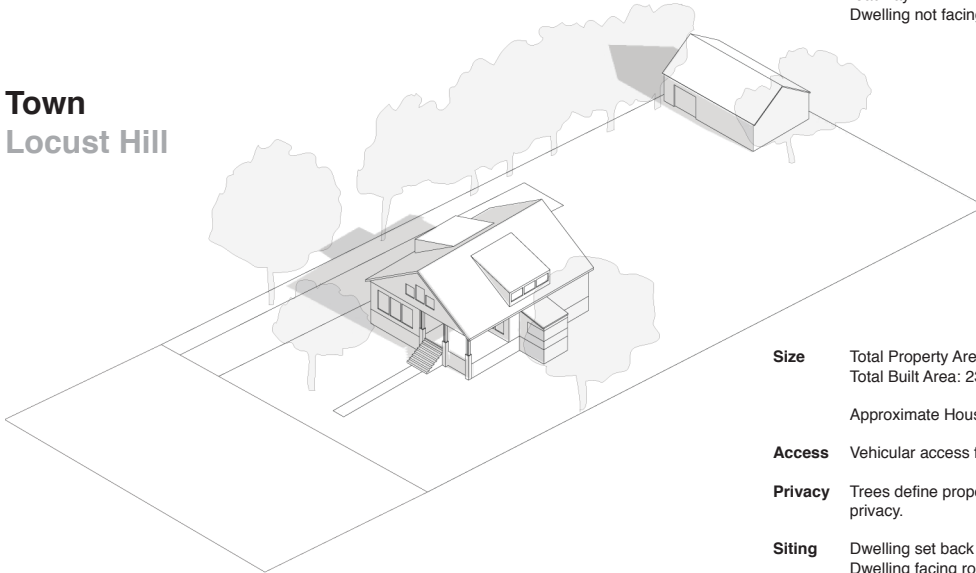
Farm
Markham



- Size** Total Property Area: 4051000 ft² [93 acres]
Total Built Area: 0.3 acres [0.3%]

Approximate House Floor Area: 2600 ft²
[original: 1875 ft²]
- Access** Vehicular access from main road.
Rear access for farm equipment.
- Privacy** Hedgerows define property boundary.
Trees/grass define yard boundary.
Neighbours distant.
- Siting** Dwelling set back substantially from roadway.
Dwelling not facing roadway.

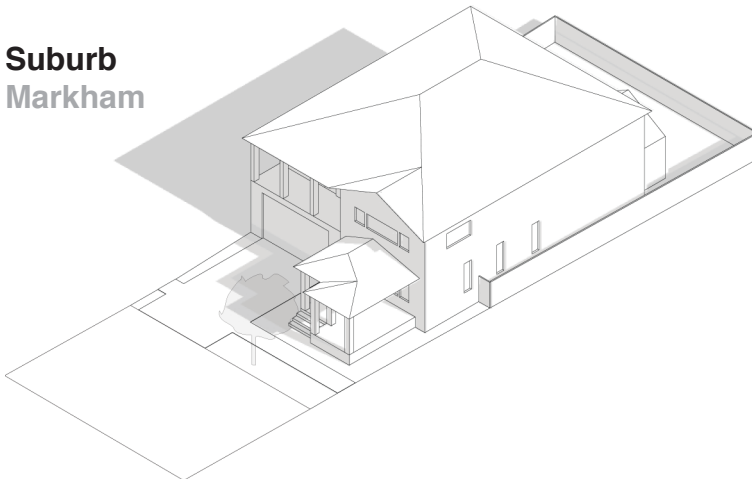
Town
Locust Hill



- Size** Total Property Area: 18447 ft²
Total Built Area: 2343 ft² [12%]

Approximate House Floor Area: 2500 ft²
- Access** Vehicular access from main street.
- Privacy** Trees define property boundary and ensure privacy.
- Siting** Dwelling set back from roadway.
Dwelling facing roadway.

Suburb
Markham



- Size** Total Property Area: 3850 ft²
Total Built Area: 2344 ft² [61%]

Approximate House Floor Area: 3884 ft²
- Access** Vehicular access from main street.
Pedestrian access from sidewalk.
- Privacy** Wooden fence defines property boundary and ensures privacy.
- Siting** Dwelling located very near to street.
Dwelling facing access street.

Comparison of local dwelling typologies (data gathered from Google Maps 2014 and Google Street View 2015).

sand acres of farmland in North Pickering in 1972 (Marshall 2007). Some of these North Pickering lands are included in the proposed RNUP area, of which the federal government owns approximately one third. Much of this government-owned land has and continues to be leased to farmers. However, unlike in pre-expropriation times, cultivation has concentrated on cash crops such as soybeans and corn, and consistent with nation-wide trends, small-scale farms are giving way to fewer yet larger operations.

The existence of extensive publically-owned land in close proximity to a major population base is an unusual condition in Canada and beyond, and, as such, has potential to become something great, if done with proper planning and vision.

Potential

Julia Czerniak (2007) discusses three roles of large parks in cities: social catalysts, ecological agents, and imaginative enterprises. Diversification of activities, spaces, and circulation systems provide opportunities for meeting, exchange, and conflict between people of diverse socio-economic, political, age, and ability groups. The provision of truly public space is very important at this time in which public space is widely undervalued and consequently disappearing or becoming ever commercialized. In addition, participatory processes through which the parks themselves arise help educate the public and necessitate compromise. This is certainly the case for the proposed RNUP, which includes lands owned by the Province of Ontario, Government of Canada, and multiple municipalities, lands significant to aboriginal groups in the area, and multi-generational farm enterprises, among other considerations. This is indeed one of the strengths of the proposed RNUP, as outlined in the *Draft Management Plan* (Parks Canada 2014), which reads “[t]hanks to the park’s urban location and its ready accessibility by approximate-

ly one-fifth of Canada's population, the potential for collaborative initiatives is greater than at any other location managed by Parks Canada" (32). As ecological agents, they nurture biodiversity, and facilitate territorial connections for ecological health. They also and serve as points of identification and pride for urban dwellers, resulting in a sense of responsibility. Perhaps most important, however, is their role as imaginative enterprises – "places to project futures" (Czerniak 2007, 244). In other words, large parks can be expressions of our hopes for the future of our cities and our relationships with nature. In this sense, they are what Jones and Wills (2005) consider utopia, but in opposition to the word's etymology, they are firmly rooted in a particular time and place.

In addition to the three roles of parks identified by Czerniak, others worth mentioning include health and economic benefits. Not only will the creation of trail networks within the park provide opportunities for recreation and exercise, the expansion of public transportation networks to these areas will ensure that they are accessible to those within the Greater Toronto Hamilton Area. The influx of people to the area and the creation of new types of land leases have the potential to generate a tourist and micro-agricultural economy. A supply of locally-grown food will be a welcome supplement to residents and businesses within the City of Toronto.

Design Goals

Informed by the *Draft Management Plan* (Parks Canada 2014a), and the site research presented, this architectural proposal aims at three main three goals:

First, to celebrate the extensive history of human occupation of the proposed park area. Reading past and present landscapes, and projecting future ones, is imperative to this task. Agriculture is the dominant economic activity within the proposed park boundary, and

transportation and service infrastructure has a strong presence.

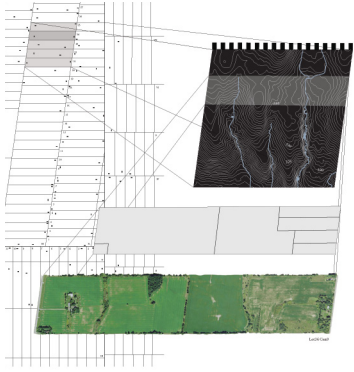
Second, to restore and intensify the unique ecological condition of the park. The biodiverse and fragile environment of the Carolinian forest and nearby wetlands are of great ecological value, and in need of preservation and extension. By including local initiatives, such as “10,000 Trees for the Rouge” (a local volunteer organization committed to restoring natural habitat within Rouge Park), native habitats can be extended, providing new habitats for various species. This respects the successional establishment of species.

Third, to connect people to the landscape of the park. Providing opportunities to experience and participate in landscape will increase public awareness of the park’s unique features and strengthen resolve to protect it.

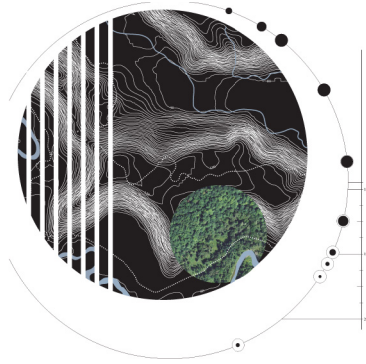
Rooms

Through graphic and textual (design role, experiential character, verb, and adjective) mapping, I have identified distinct landscapes within the proposed site area: farmland, forest, marshland, and beach, abutted by a suburban edge, all connected by a riparian spine, and interrupted by artifacts – primarily infrastructure and settlements.

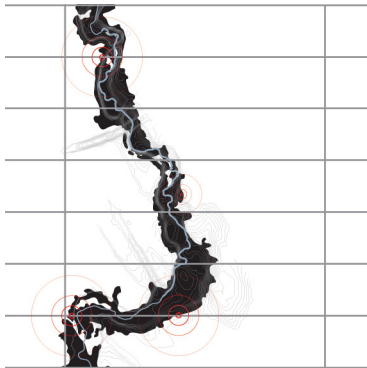
The conceptual organization of the park is reminiscent of OMA’s design for Parc de la Villette (Koolhaas and Lucan 1991), yet at a very different scale. I propose a diversity of program to populate each band, and the riparian zone to serve as a circulation spine of active transport that connects all zones and programs of the park. Because the park functions at the scale of the watershed, it is unsurprising that the landscapes are organized sequentially from north to south, according to fluvial geomorphology, and resultant flora and fauna populations.



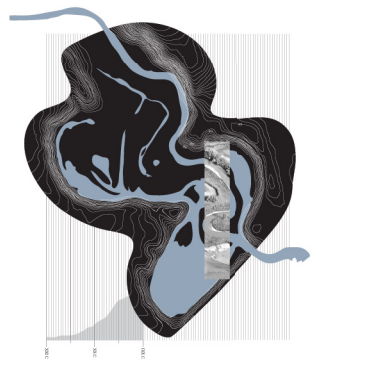
FARMLAND
economy • exposed • cultivate • repetitious



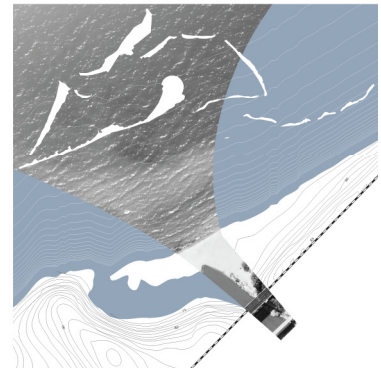
FOREST
escape • stimulating • conceal • primal



RIPARIAN SPINE
travel • sheltered • connect • directional



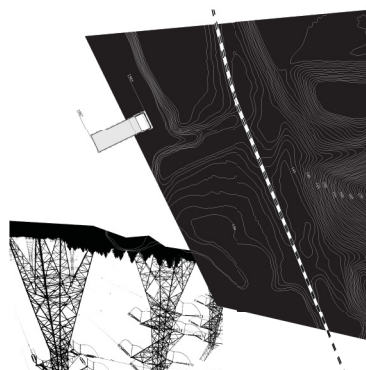
MARSHLAND
vitality • sensuous • research • murky



BEACH
relaxation • exposed • embrace • bright



SUBURBAN EDGE
edge condition • safe • replicate • threshold

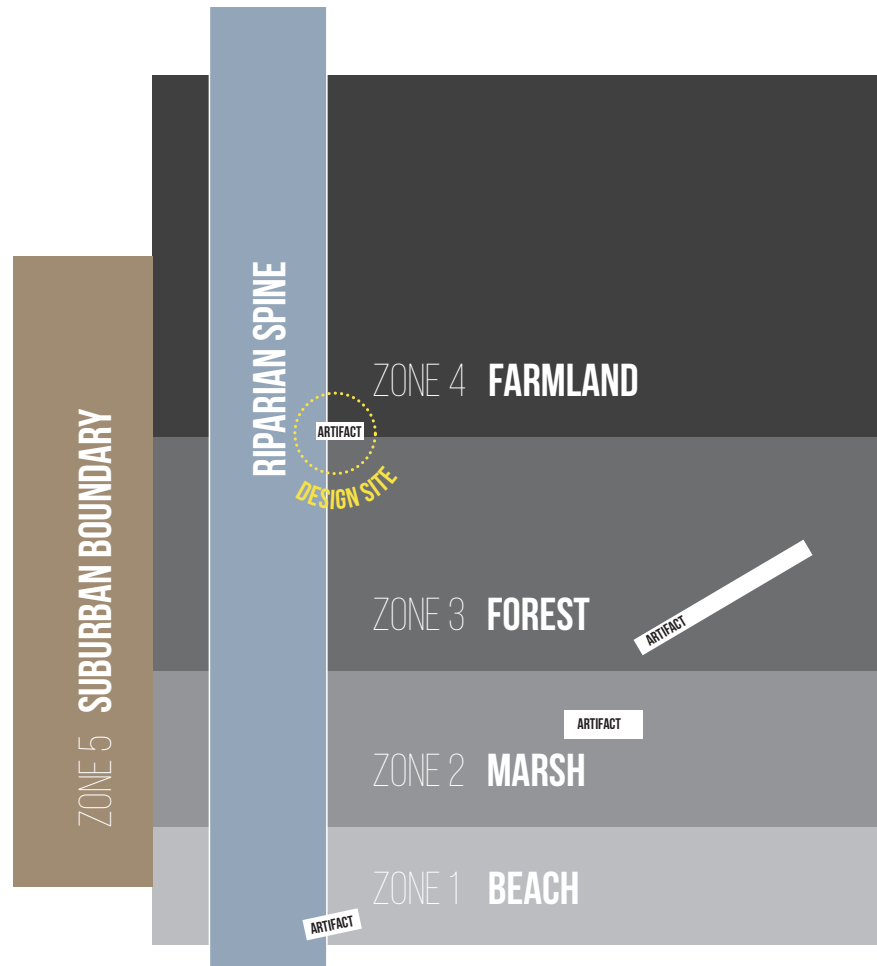


INFRASTRUCTURE
orientation • dissonance • divide • manufactured



SETTLEMENT
access • active • gather • quaint

Distinct landscapes of Rouge National Urban Park with expanatory text (design role, experiential character, verb, adjective).



Park Strategy Diagram

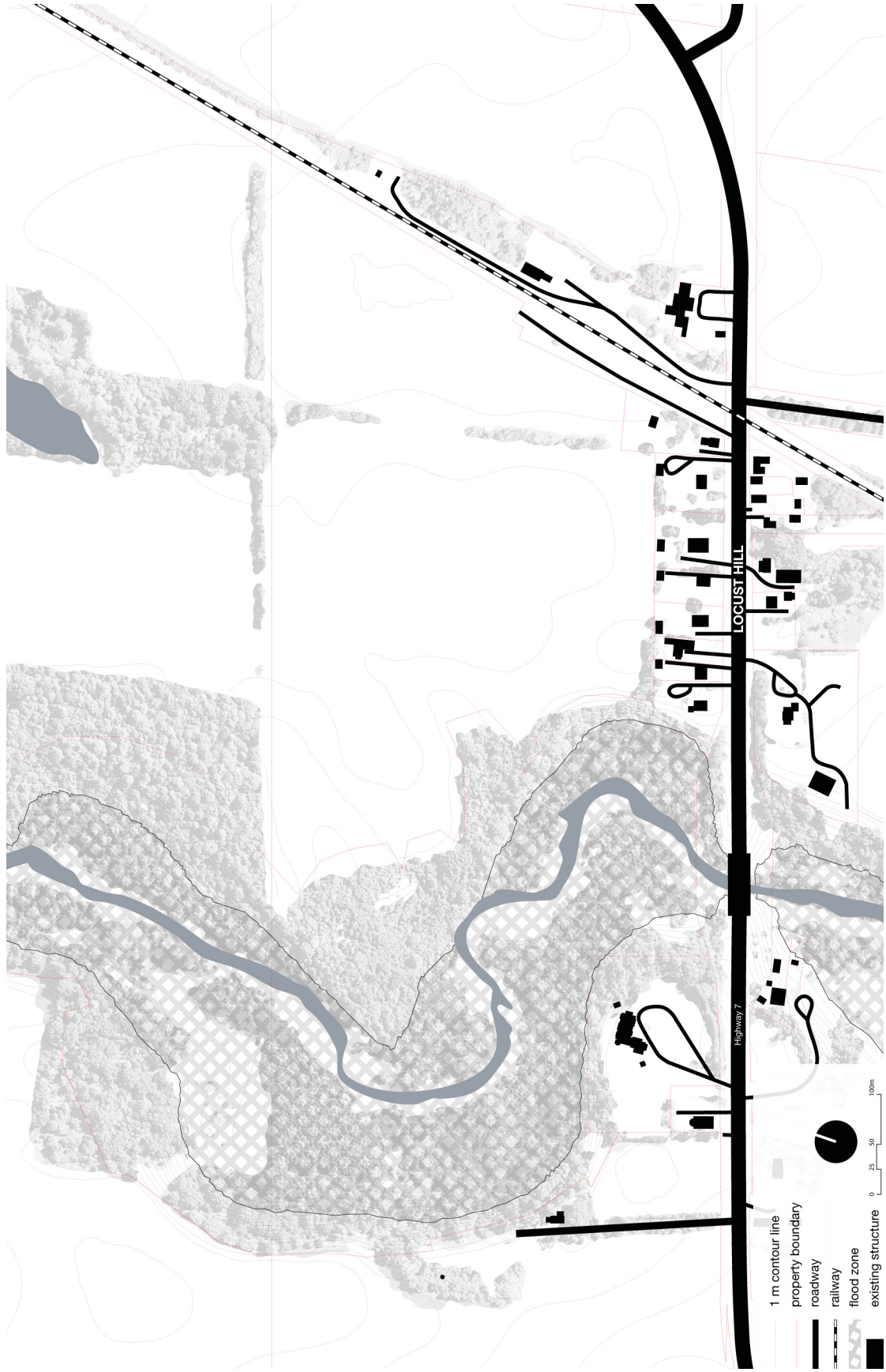
CHAPTER 4: LOCUST HILL

Conditions

Locust Hill, Ontario is a small residential settlement of fewer than twenty-five residences located along provincial Highway 7. Properties and driveways extend perpendicularly from the roadway, and are typically populated by a house at the front and a garage at the rear. The post office, church, and auto-body paint shop are the few non-residential operations in the hamlet.

The hamlet was located strategically near the Little Rouge River, and the Ontario and Quebec Railway, which arrived in 1884, linking Locust Hill to markets beyond. It became an important rail transport hub for commodities such as flour, milk, and livestock. Rail service ended in 1969, yet the infrastructure remains.

The area directly north of Locust Hill is, for several reasons, an ideal design site within the proposed park. First, it is located at the intersection of several different landscapes, including riparian spine, farmland, forest, town, and infrastructure. Whereas architectural design for individual landscapes is limited in its scope, design for this intersection demands an understanding of relationships and integrated responses, and is more representative of issues encountered throughout the park. Second, it is a potential future transit hub for GO Transit, the regional transit authority (Parks Canada 2014a). Currently, there exists no commuter rail access within the proposed park boundary, so the addition of a hub would address the necessity of park accessibility, especially of urban dwellers, who are less likely than non-urban dwellers to own automobiles. Not only does the Locust Hill site serve as an intersection, but also as a gateway for people arriving via public transportation. And in addition to direct sale, there are also opportunities for education, participation, and personal production. Third, it presents opportunities for



Existing Conditions of Locust Hill (topographic data from TRCA 2014, satellite imagery from Google Maps 2015).



South of Highway 7



West to East on Highway 7



North of Highway 7

Streetscapes of Locust Hill, Ontario. (Google Street View 2015)

park development as outlined in the *Draft Management Plan* (Parks Canada 2014a).

namely the development of diverse and community-based agricultural models, the combination of residential and farm leases, and the emergence of ‘cottage industry’ commercial enterprises. The close proximity of hub to hamlet provides opportunities for the provision of short-term accommodation, and for various local commercial activities.

Water

As within the proposed park boundary as a whole, water has a significant presence near Locust Hill. The Little Rouge River intersects the hamlet, and aerial photographs show localized and linear wet areas that interrupt agricultural fields. Mixed forests of Sugar Maple, White Pine, American Beech, Basswood, Eastern Hemlock, and American Elm dominate the riparian zone.

Soil

The soils surrounding Locust Hill are classified as Class 1 under the

Canadian Land Inventory system. These soils “have no significant limitations in use for crops. Soils in Class 1 are level to nearly level, deep, well to imperfectly drained and have good nutrient and water holding capacity. They can be managed and cropped without difficulty. Under good management they are moderately high to high in productivity for the full range of common field crops” (Government of Ontario 2015).

Climate

The Locust Hill site is located within the 5b climate zone of Canada, taking advantage of Lake Ontario’s tempering effect. The average latest spring frost is May 5, whereas the earliest autumn frost is October 10; the result in an average of 157 frost-free days. Significant precipitation and mild year-round temperatures encourage seasonal plant growth.

CHAPTER 5: DESIGN

I propose a demonstration farm (vegetables, fruits, berries, nuts, and animals) for Locust Hill, which will serve as an interface between the public, and the worked, occupied landscape. For visitors, the farm will at once serve as a destination for recreation, education, and commerce, and as a jumping-off point for those wishing to explore the larger riparian system of the park. For farmers, the farm will serve as a source of employment and income. The proposal aims to celebrate, yet reinterpret, the land survey grid from a wholly private notion to a more communal one that revolves around local production and consumption, rooted in place.

Elements

The architecture of the proposed agricultural hub is a holistic addition to the landscape, with earth mounds rising from the fields to support a low-profile roof. The design of the agricultural architecture is defined by several elements that appear in various combinations and expressions throughout the Locust Hill site. I propose to re-employ these typologies throughout the agricultural landscape of the park, contributing to its particular character and legibility.

Roof

Diversion [vertical], Protection, Direction

To experience farmland is to experience earth and the sky. The open expanse of the growing surface is accompanied by experiences of relentless wind, sun, and precipitation. In the absence of trees or built structures that offer shady respite, exposure is complete and unforgiving. A roof is a necessary architectural element for survival here.

The roof performs as a strong landscape gesture – a simple, low-

pitched gable roof, hovering above the horizon – but also environmentally as collector of solar energy and rainwater. While spring run-off will be collected in a system of irrigation ponds across the site, explained below, the expansive roof will catch and direct additional water, critical for orchards and market gardens. A constant supply of electricity will power the operations of the entire farm (irrigation pumps, refrigeration, heating, plumbing, ventilation), supplement the town of Locust Hill, and even support additional residential and commercial development.

Screen

Division, Protection

The screen is a versatile design element for Rouge National Urban Park, and is manifested several ways. First, hedgerows are integral elements in the agricultural landscape and mutually beneficial for humans and non-humans. They provide wind protection for agricultural production, encourage snow accumulation for spring field moisture, and mark property boundaries. They also serve as habitat for many birds, mammals, and insects (including pollinators such as bees). In the proposed Rouge National Urban Park, hedgerows act as ecological corridors connecting larger patches along riparian zones. The main agricultural building itself acts as a hedgerow, bisecting the property north-south. It too acts as a wind shelter. Second, building screens, which include elements such as (1) galvanized steel trellises, which serve as vertical growing surfaces and visual and wind screens at maturity, (2) nylon screens, which permit airflow but prohibit insect travel, and (3) vertical solar screens, which provide solar shading, yet allow for framed views of the landscape.

Ditch

Diversion [horizontal], Division

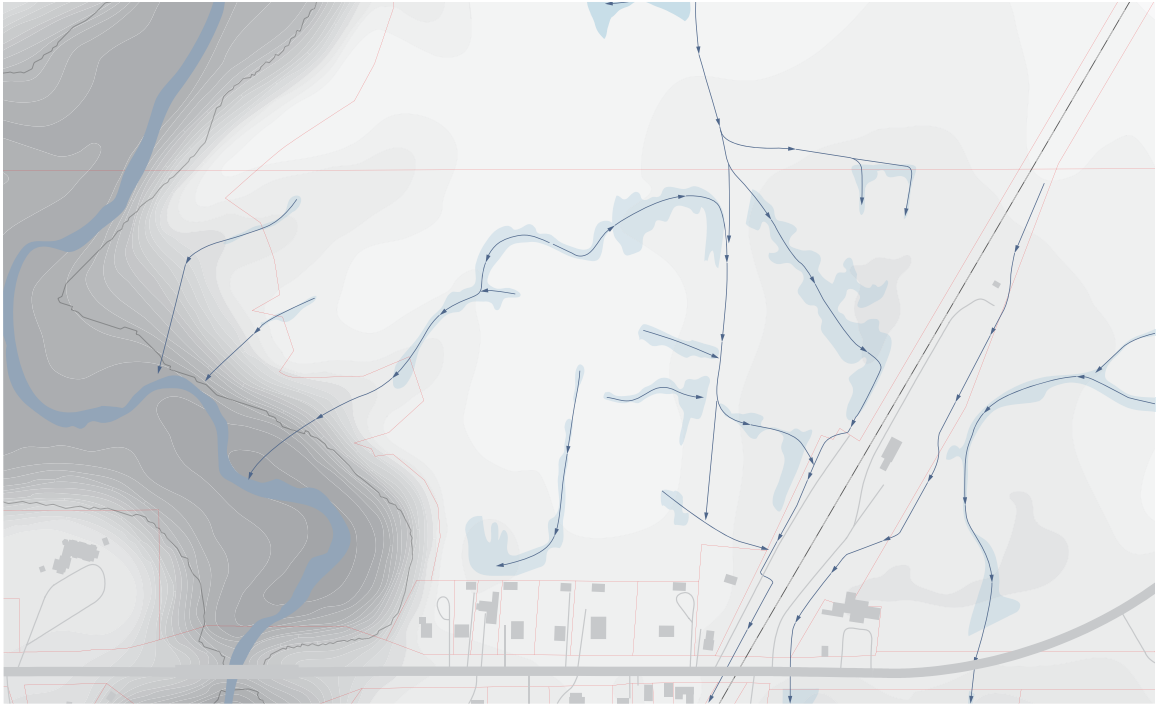
Water management is a necessary dimension of agriculture. In the case of large-scale cash crops such as soybeans and corn, drainage, though the use of subterranean drainage tile is often sufficient; however, high-value crops sensitive to moisture levels, such as those of market gardens and orchards, require irrigation, and thus water collection.

In the springtime, soil near the field surface is moist due to run-off, and new plants grow only short roots to access it. As the season progresses and the water table lowers, plants become stressed because their root systems are insufficient. By providing sufficient drainage early in the season, plants grow deep roots, enabling them to access water throughout the season.

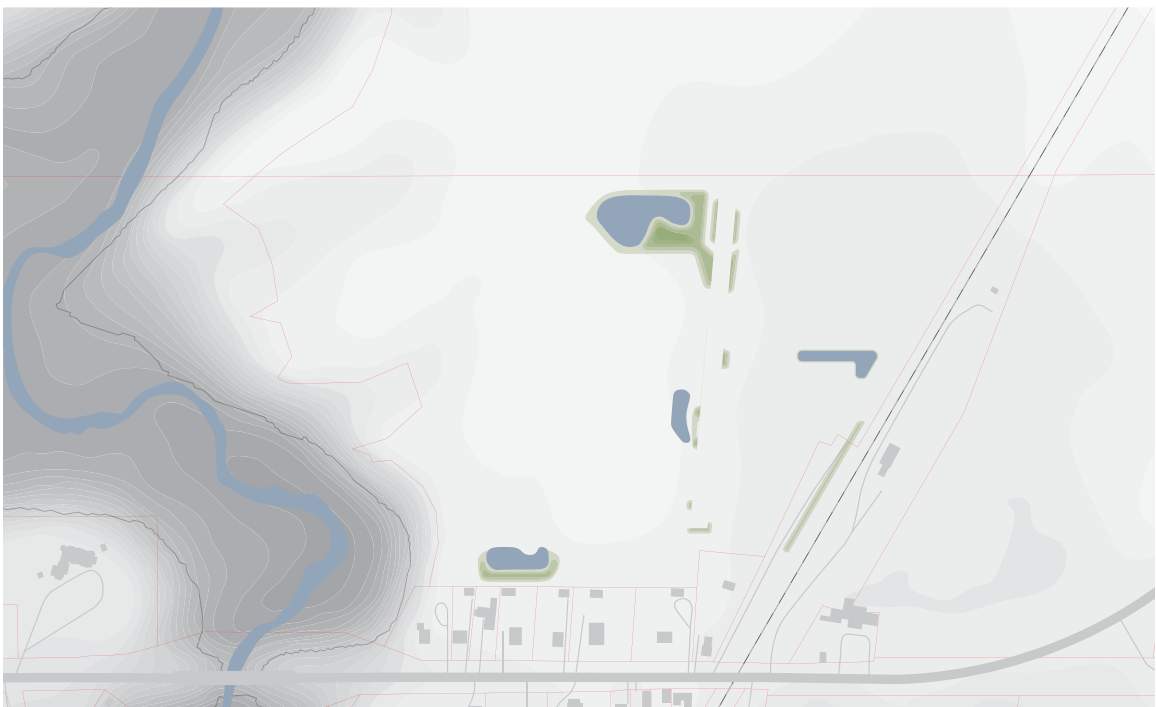
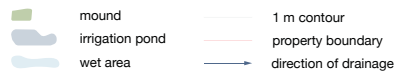
Mound

Elevation, Diversion [horizontal], Division

The excavation of ditches and irrigation ponds results in the availability of earth. I propose using this earth to create mounds that create topographical difference – and thus elevated positions – within the agricultural landscape. Similar to *Underground Houses* by Philippe Rahm architectes (2005), they take advantage of the stable earth temperature to facilitate interior program. Storage and processing areas occur within earth these thermally-regulated mounds, resulting in reduced energy consumption by heating and cooling functions. In addition, mounds also direct the flow of water and people across the site.



EXISTING DRAINAGE



PROPOSED WATER STRATEGY

Existing and proposed water conditions at Locust Hill (hydrogeological data from TRCA 2014).

Pond

Collection

In the same way that water is the organizing principle of the larger park boundary, water is the organizing principle of the Locust Hill site. Locust Hill experiences considerable dampness, a condition most pronounced in the spring. In order to take advantage of this seasonal condition, several berms are positioned to direct the flow of water across the site and collect it in reservoirs. The intention is for spring runoff to stock the four irrigation ponds across the site, while any additional water required will be pumped up from the Little Rouge Creek as necessary. Each pond will service its adjacent plots through drip irrigation lines or a sprinkler system, as determined by individual farmers. In addition, the substantial roof area of the main building serves as a valuable water-collecting surface. This water will supplement irrigation reserves and be used for food processing, toilets, and cooling within the building.

Plot

Division, Cultivation

The width of the farming grid is a human-scaled compromise between the structural grid and the requirements for financially viable farming. Jean-Martin Fortier (2014) presents the case for small-scale biologically intensive agriculture, arguing that a “well-established, smoothly running market garden with good sales outlets can bring in \$60,000 to \$100,000 per acre annually” (3). Combined with research of other market gardens, I consider one-acre plots sufficient for the farm. And while most of the plots are approximately one acre in area, there are smaller, half-acre plots, and larger, one-and-a-half acre plots. Many of these plots have corresponding forest area, which can be used for foraging, especially swine and

cattle. These different sizes accommodate varying levels of commitment and expertise of interested lessees.

Garden beds are orientated east-west for several reasons. First, original two hundred acre land survey plots in Markham were laid out in this manner. Second, the orientation ensures proper drainage to either side of the north-south oriented high point of the western plots. Garden beds are also to be permanently raised. Fortier (2014) notes several benefits of this practice, including better drainage, beds that warm sooner in springtime, higher yields, looser soils, and easier soil building.

The long, rectangular plots of the farm reenact the memory of the original land survey system, but at a more human scale. They aim to combat the dangers of the pictorial landscape image, namely that “because the passage of time, landscape decontextualizes its artifactuality and takes on the appearance of something natural” (Corner 2014a, 245). Their scale and intensity of occupation will ensure that the origins of these plots will be recognized as human.

Site Program

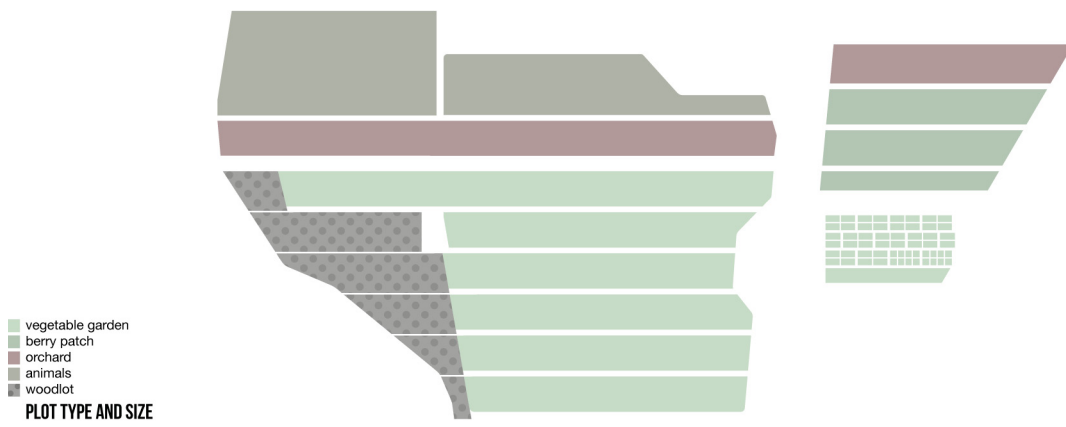
The land is divided into east and west by the north-south oriented



Physical site model. Original model scale: 1:2000.



Proposed Site Plan of Locust Hill (hydrological data from TRCA 2014).



Locust Hill proposed site system diagrams.

building. Land to the west is designated as the main commercial growing area – it includes the primary plots, orchards, and animals operations. Land to the east of it is more participatory and exploratory – it includes allotment gardens, u-pick areas, raised teaching beds, and a playground. Naturally, worker accommodations are located on this side, at once participating in the communal nature of this side and slightly removed from the everyday operations of the other side.

Access

Movement

Vehicular access to Locust Hill Farm is through one of two entrances: the north gate, which permits traffic to circulate to the stables and harvest processing areas, and the south gate, located between existing residences on Highway 7, which permits access to the main parking lot and commercial and educational clusters. A roadway interior to the park, oriented parallel to the railway, connects the two gates. Consistent with the surrounding farmland, vehicular circulation occurs along the perimeter of the plots.

As noted above, a GO Transit commuter rail station is proposed for Locust Hill (Parks Canada 2014a). This will provide important non-vehicular access to the site. A wide promenade links the station to the hub, while a mound acts as a portal between the two. The area east of the railway is zoned to accommodate program and further development associated with the rail station.

Movement across the farm will, for visitors, be in the form of walking and cycling, and, in the winter, Nordic skiing. Pedestrian paths line the main building, simultaneously taking advantage of protection offered by projecting eaves, and emphasizing the infinity and rigidity of the agricultural landscape. Relentless linear movement is inter-

rupted by various points of interest along the line, and it finally gives way to meandering, curvilinear movement around the northernmost irrigation reservoir.

For labourers, walking and cycling will also be important, as will ATVs and pick-up trucks. Access roadways, seeded with hardy greenery such as white clover, line each farm plot, forming a network of easy access for people and produce. This network also serves as staging areas for crop tunnels, hoop houses, and other season-extension methods. Access roadways also serve as secondary, public routes for curious visitors, and emergency vehicles, if necessary.

Public / Private

The delineation between public and private space is of importance for the farm. Within the purview of participatory food culture, farm plots would be made available on variable term leases. Longer-term leases would encourage investment in long-term crops, such as fruit and nut orchards. As mentioned, the spatial practices involved with small-scale farming in a communal arrangement engender a new mode of interpersonal relations – a new set of expectations among participants, and a new set of values of respect for the earth and others. While this might be true of farmers and seasonal workers, visitors to the farm might need reminders. So, elements such as arboreal screens and a system of fences and gates line circulation paths, providing a buffer between private and public, while strategically placed ha-has provide both visual connection and programmatic separation.

Proposed patterns of dwelling on the farm are opposed to those of the land survey grid. Rather than allotting one dwelling to each plot, dwellings are combined in a bunkhouse on the north end of the property intended for farm labourers (field workers, restaurant staff,

etc.). The building provides opportunities for socializing, outdoor dining, washing, and resting, out of sight of the curious public. Individual bedrooms provide the spatial, visual, and acoustic privacy once afforded by the land survey grid.

Building Program

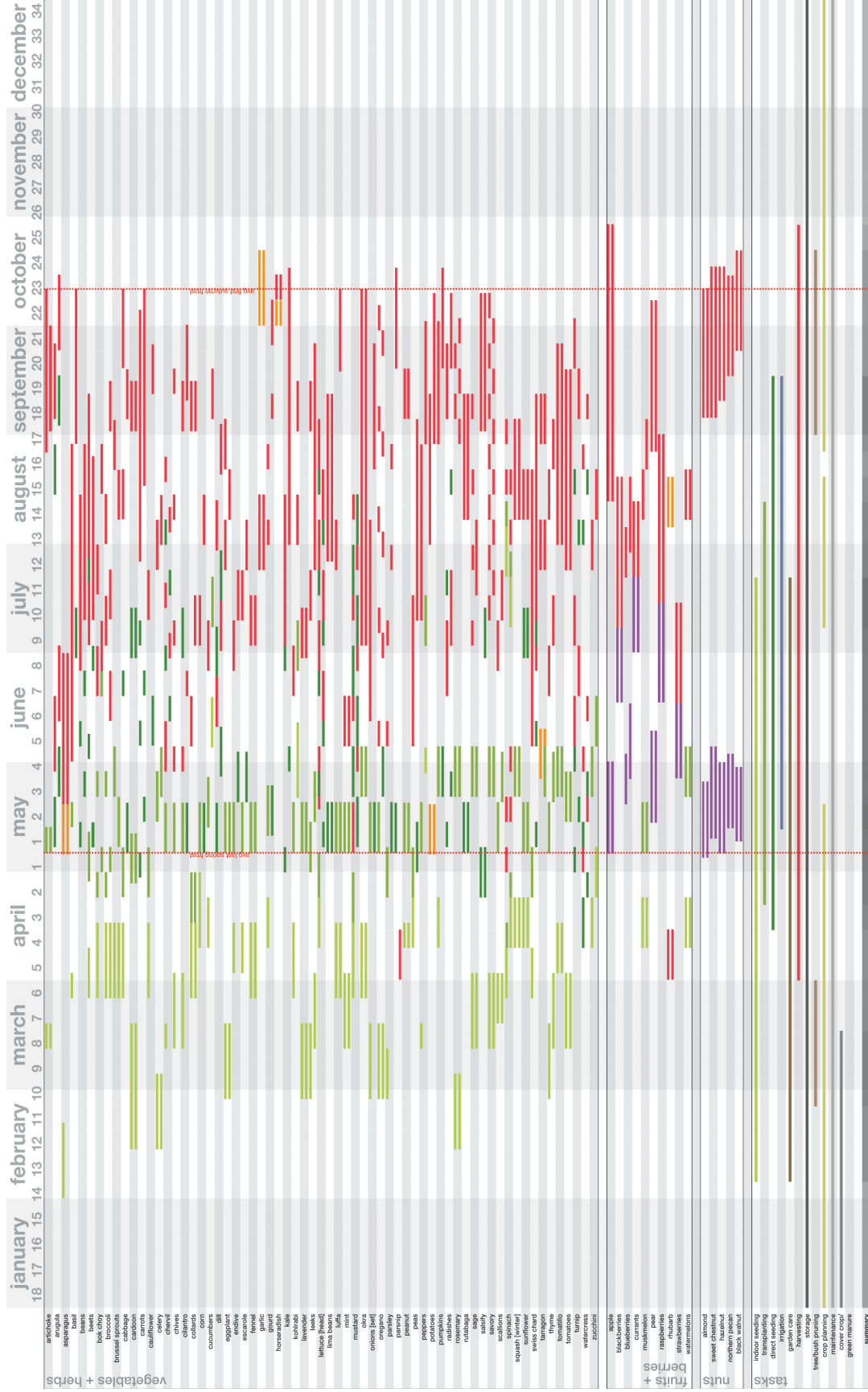
The main building is comprised of four programmatic clusters: commerce, education, production, and processing and storage. The sequence of these clusters at once informs and is informed by the layout of and agricultural processes practiced on adjacent lands.

Agricultural Practice

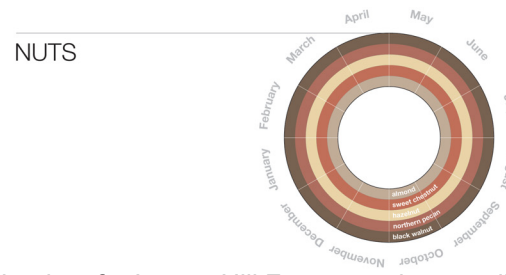
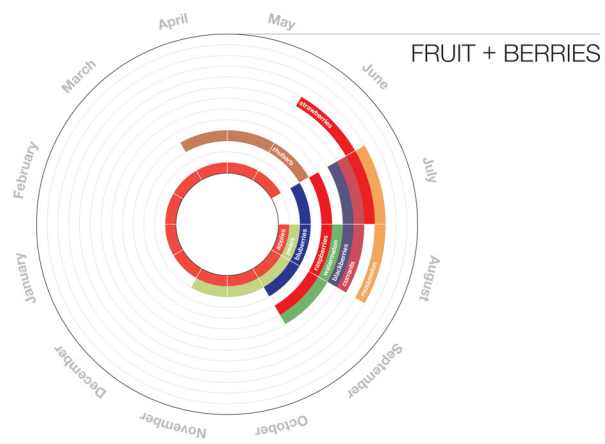
Particular consideration has been given to the processes involved with bio-intensive agriculture: (1) seeding – indoors or direct, (2) transplanting, (3) cultivation/maintenance, (4) harvesting – cutting, picking, digging, (5) processing – washing, sorting, bagging, and (6) storage – short and long-term, at variable temperatures and humidity levels.

Inputs

In addition to an adequate irrigation system, discussed above, human labour is the most significant input to the successful operation of Locust Hill market garden. Possible crop types of three categories – vegetables and herbs, fruits and berries, and nuts – suitable to this climate have been compiled and analyzed according to their needs. Requirements for seeding indoors, transplanting, direct seeding, and harvesting have been identified, as well as tree blossoming. Additional tasks applicable to the garden at large have been identified and assigned timelines. The busiest seasons of the year are unsurprisingly spring and summer, and the busiest months are May and July.



Inputs calendar for Locust Hill Farm (data from Johnny's Selected Seed 2015, Vesey's 2015).



Output Calendars for Locust Hill Farm - produce availability (data from Foodland Ontario).

Animal grazing is used as a biodynamic practice to tend the orchard areas as required. Vegetable and fruit waste are collected and fed to the swine, whose manure, along with that of the sheep, horses, and poultry, is incorporated into the soil to build its nutritional and microorganism health. Cover crops such as rye, oats, and legumes, and green manure crops of buckwheat are planted to recuperate soil fertility and prohibit the establishment of weeds during periods where produce is absent from fields.

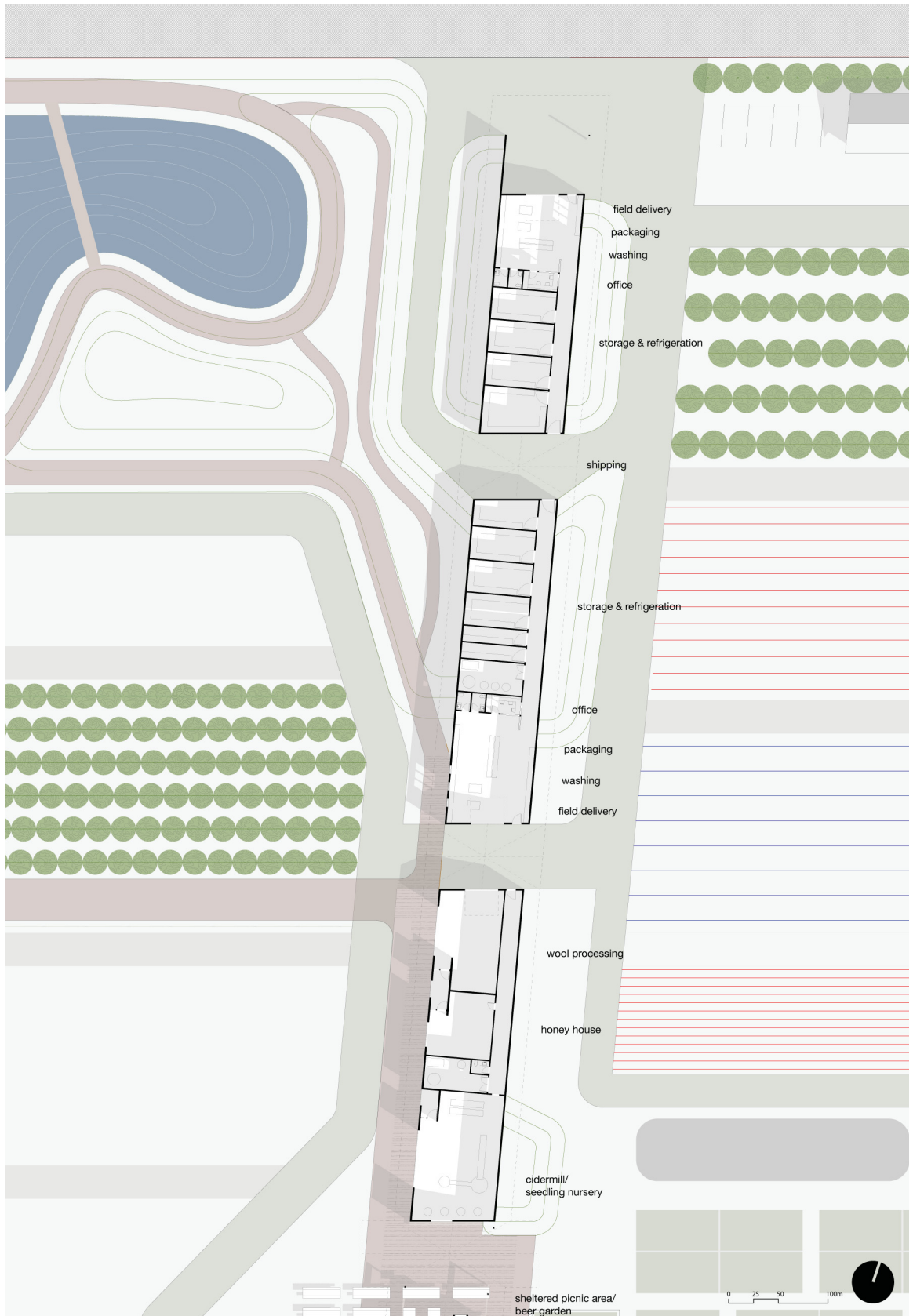
The scale of the farm and the fragility of its produce permit and encourage the replacement of petroleum-powered machinery with human power, or machinery requiring a combination of the two. Not only does this participate in a less carbon-dependent world, it facilitates direct relationships with the earth and each other.

Outputs

Farm produce has been mapped according to seasonal availability, taking into account proper storage processes. Whereas many of the vegetable and herb crops are available between June and October, root and tuber crops in particular are available nearly year-round. Fruits are available almost exclusively between June and September, but several – including apples – are available nearly year-round. Nuts, while of smaller quantity, are available year-round. This points to a need for generous summer/fall storage space for fresh produce, and year-round food storage capabilities or hardier crops. Communication and flexibility between farmers will allow occupation of storage spaces to change over the year. While some farmers might focus on crops requiring short-term storage early in the growing season, others might focus on ones requiring long-term storage at the end of the season.

Building Structure

The main building adheres to an 8 m x 10 m structural grid, which



Building plan - northern portion.

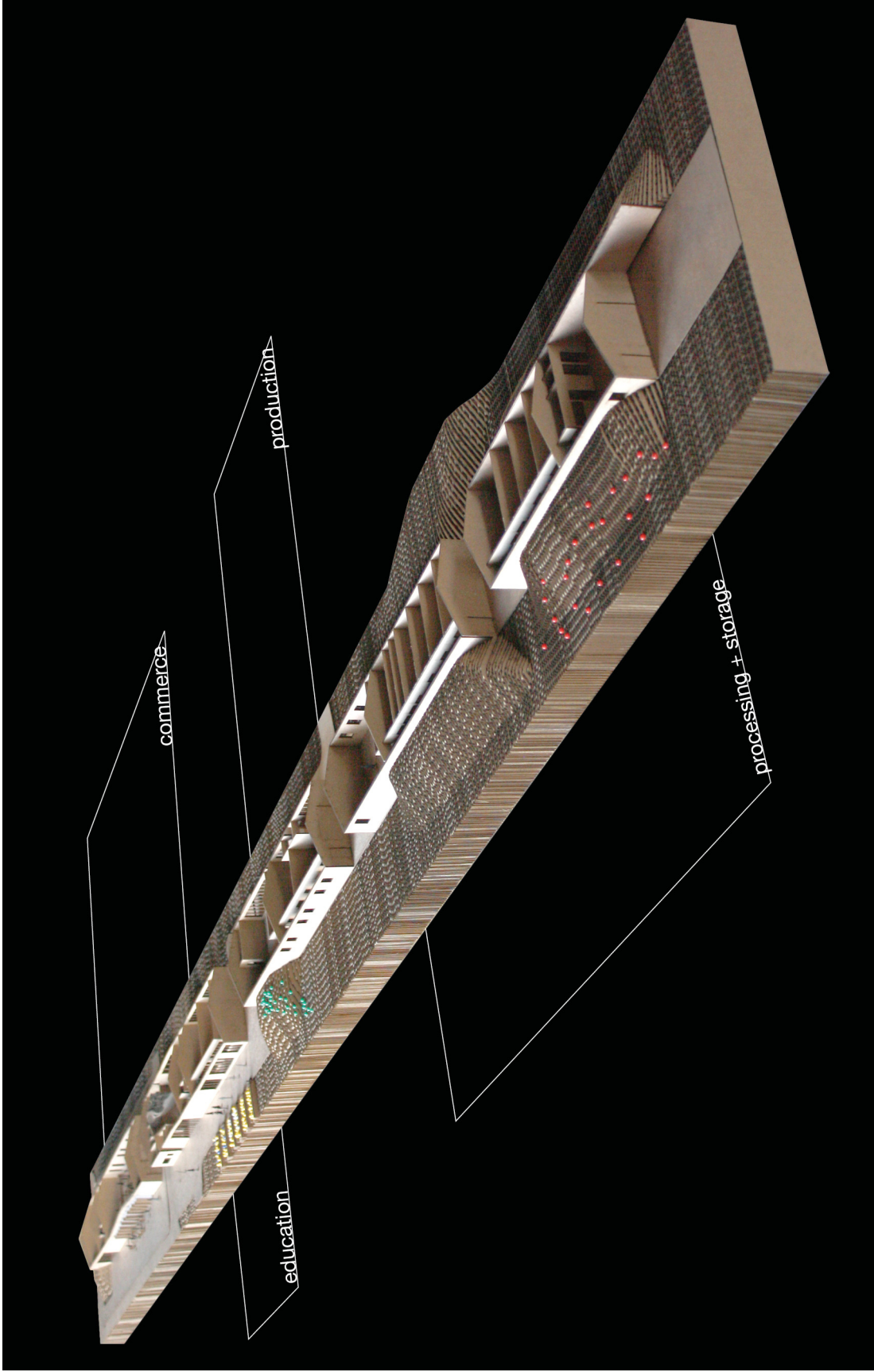


Building plan - southern portion.

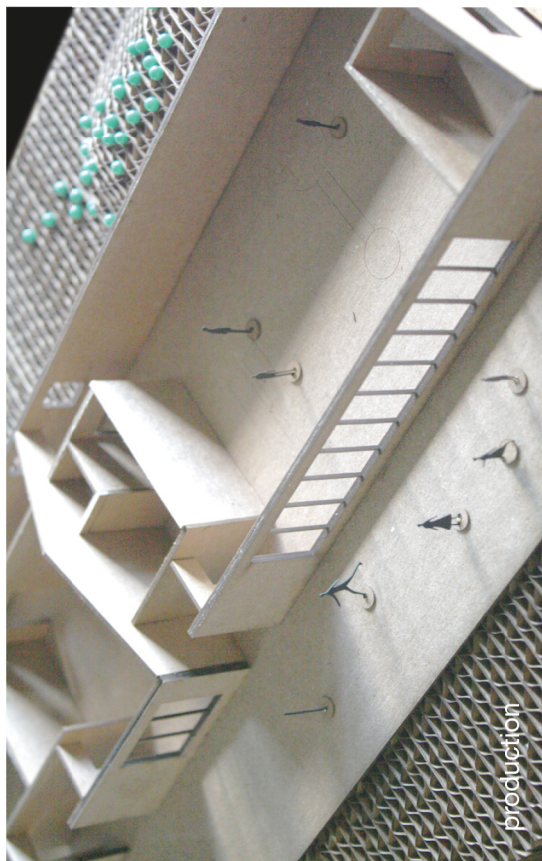
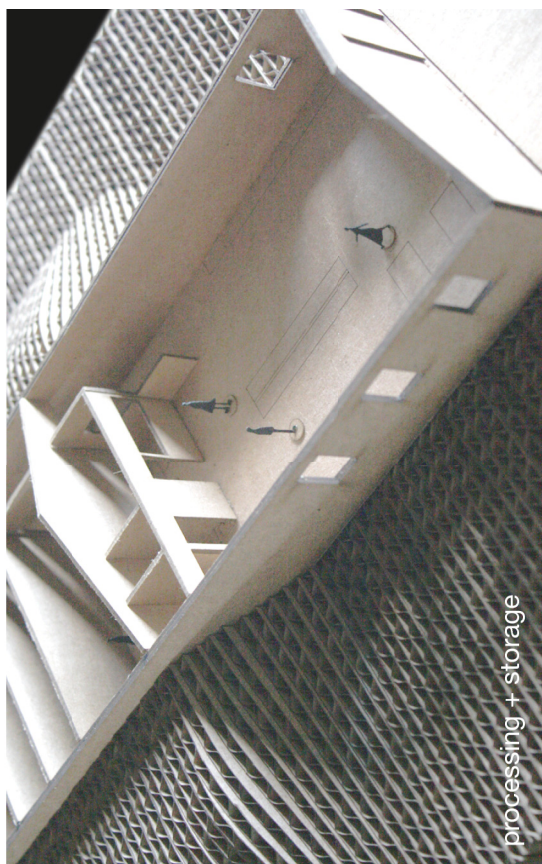
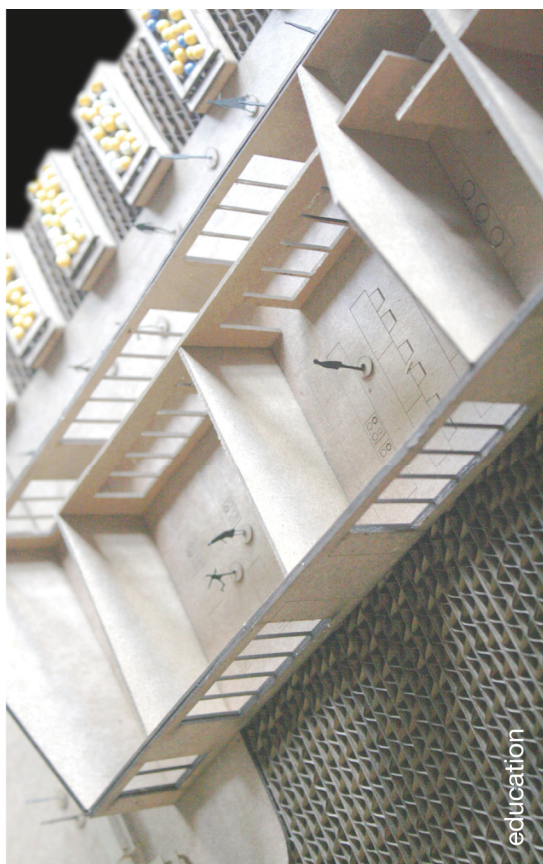
allows for unobstructed panoramic views. This grid is compatible with both the proposed farming grid of 24 m wide plots, and the 10 m wide aboreal hedgerow currently occupying the site. The construction is a hybrid system. Concrete floors extend throughout the building, and concrete walls cap the ends of each building bar, acting as shear panels. Steel columns and beams support wooden trusses above, which in turn host steel collars. These substantial trusses support a simple, corrugated steel roof. Vertical board and batten wood cladding accentuates the transverse directionality of the adjacent fields and addresses the history of deforestation that enabled agriculture, discussed above. The selection of these materials must be understood in their contexts of farming (utility) and public interface (delight, comfort, meaning).

Passive Strategies

The passive strategies employed on the farm attempt to ground the architecture within the landscape it celebrates. The main building, oriented north-south, takes advantage of westerly winds to drive passive ventilation, while exhaust fans, mounted on the gable ridge and powered by the photovoltaic surface of the roof, supplement it. Ground source heat pumps supply heat to the sections of the building requiring year-round occupancy. Solar shading is provided by vertical louvers, generous eaves, foliage-covered screens, and trees.



Building model with programmatic clusters. Original model scale: 1:100. Original dimensions: 260 cm x 30 cm x 10 cm.



Programmatic clusters.



Farm labourers cultivating the landscape.



Crossover area between east and west side pathways.



Winter recreational activities on the farm.



View north at the intersection of the promenade and main building.



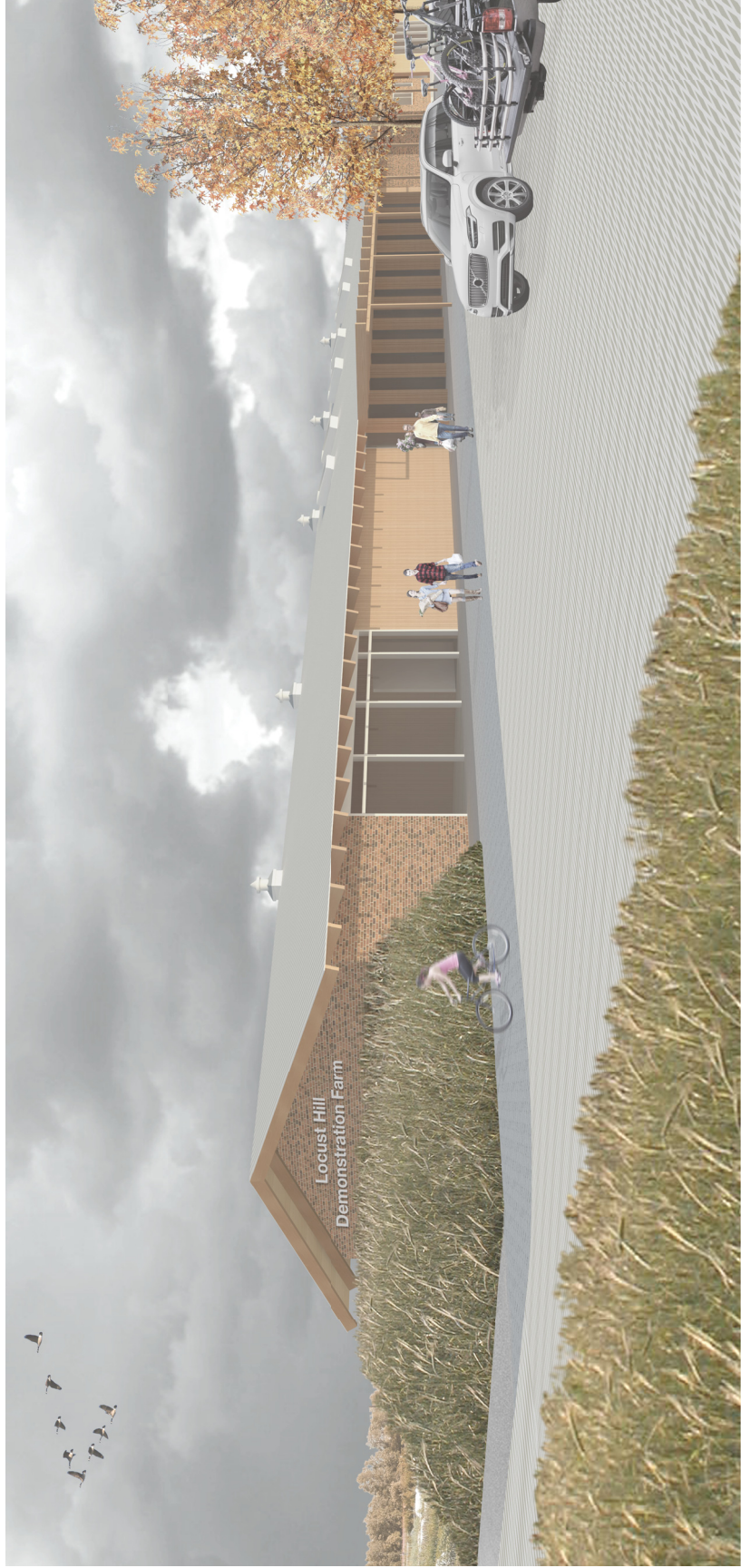
Restaurant interior/exterior.



Spatial atmosphere of marketplace interior.



Saturday morning market – view south along rotating screen panel wall.



View north along east facade and across parking lot.



View west along the promenade from the railway station.



Labourers resting at the bunkhouse after a day's work.

CHAPTER 6: CONCLUSION

As cities expand and suburban fabric conquers ever more land on which both ultimately depend, preservation of watersheds and their ecosystems becomes ever more important. But so too is the provision of areas and networks for local food production, education, and recreation. The relevance of this thesis research lies in the transference of a methodology of landscape into the production of built form. It explores how the human/nature binary can be overcome by transforming the understanding of landscape from image to actively-engaged, occupied space. The great responsibility and potential of architecture is to foster a deeper awareness and appreciation of the non-human world by creating opportunities for meaningful engagement with it. Rouge National Urban Park, in particular, embodies this potential and can contribute to conversations regarding the engagement of existing national parks.

There is a degree of utopian exaggeration to the project, which is, as previously noted, an expression of the park's role as imaginative enterprise. The power of representation lies in its ability to entice the viewer and convince him/her of the aims of the architectural proposition. By proposing something so optimistic, I hope to nurture the seeds of the park planted years ago, and anticipate the incredible yields it will produce. While an imaginative enterprise, the proposed agricultural hub remains tethered to the ground through focused research of site conditions, site processes, and regional networks.

The challenge of this thesis lies in the scale of the park, and the many features it contains. Czerniak (2007) uses the term large park to denote those larger than 500 acres, and many important parks of today are of comparable size (Central Park: 843 acres; Shelby Farms Park: 4500 acres; Fresh Kills Park: 2200 acres).

Rouge National Urban Park (RNUP), however, is an estimated 14,330 acres, an area significantly larger than most urban parks under discussion. This drastic difference in scale results in a significant design challenge, for similar to scaled raster images, the resulting design strategies are pixelated and illegible. For this reason, as well as a limited budget of \$143.7 million over ten years and \$7.3 million annually (Parks Canada 2015), process-based strategies are arguably most effective for achieving the design goals of this project. Process-based strategies would engage the temporal, always-becoming, dimension of landscape. While agriculture is an anticipated understanding of productive landscape, focused investigations in the other landscapes of the park – marsh, beach, forest, etc. – would reveal opportunities for innovative architectural interventions to similar aims.

Development of the proposed park is a slow process, and every few months it appears in the headlines, causing one to question whether it will ever come to fruition. Most recent was the Government of Ontario's refusal to transfer 5400 acres of provincial land to Federal Government for the creation of the park. The dispute centered on environmental protections. As the David Suzuki Foundation (2015) writes, "[t]he bill fails to meet the fundamental requirement that a protected area must prioritize nature conservation as laid out in international standards, and fails to meet or exceed the environmental policies of the existing Greenbelt, Oak Ridges Moraine and Rouge Park plans". Regardless of political allegiance, communication and even compromise are necessary for the creation of the park – especially one of this magnitude. The opportunity is too ripe not to be harvested. A nuanced, site-specific approach, which takes into account the significant agricultural history of the area, is required.

Compromise is an inescapable aspect of living in the world, and

requires taking responsibility of one's actions. Summarizing Wendell Berry, Cronon (1996) states, "[c]alling a place home inevitably means that we will use the nature we find in it, for there can be no escape from manipulating and working and even killing some parts of nature to make our home. But if we acknowledge the autonomy and otherness of the things and creatures around us—an autonomy our culture has taught us to label with the word "wild"—then we will at least think carefully about the uses to which we put them, and even ask if we should use them at all" (89). In this context, RNUP provides us with a contemporary site for important discussions about human relationships with the natural world, including the use of resources and networks of food production and distribution, and models of labour and capital, which have major implications for both. And it does so, free of the destructive pressures of private development and the constant fear of encroachment. This is an unprecedented opportunity for defining a new type of landscape for the 21st century.

APPENDIX: DESIGN PRECEDENTS

Precedents are organized in four major groups:

Urban Parks

Disneyland
 Landschaftspark Duisburg-Nord
 Lifescape, Freshkills Park Masterplan
 Parc de la Villette (OMA)
 Shelby Farms Park Masterplan
 Taichung Gateway Park
 Tree City, Downsview Park

Non-Urban Parks

Drenstche Aa National Landscape

Buildings

Underground Houses

Other

Appalachian Trail

Disneyland

Project: Disneyland, Anaheim, California

Design Team: Walt Disney

Year: 1955

Area: ~85 acres

Summary

Disneyland is the model theme park of the twentieth century. Divided into distinct lands (Fantasyland, Adventureland, Frontierland, etc.), it strives to create distinct atmospheres – and therefore visitor experiences – through the deployment of architectural form and

materials, plantings, characters, performance, and food and drink. Transportation is provided in the form of a raised monorail and an on-grade railroad.

The number of visitors the park attracts each year – more than sixteen million in 2013 – is testament to the power of landscape in the human imagination, not to mention the dizzying promises of pleasure and the undeniable forces of marketing.

- Findings**
- the division of a larger area into rooms of specific character

Landschaftspark Duisburg-Nord

Project: Landschaftspark Duisburg-Nord, Germany

Design Team: Latz + Partner

Year: 1991

Area: 494 acres

Summary

Landschaftspark Duisburg-Nord is a novel park constructed on the site of an abandoned and contaminated iron processing facility in the lower Ruhr region of Germany. Rather than reject the industrial past or revive the industrial sublime, the park aims to preserve and strengthen the community's collective memory through inhabitation of the site.

New kinds of human habitation have been imagined: the blast furnace is now a viewing platform, the walls of the ore-bins are used for rock-climbing, and the water-filled gasometer is used as Europe's largest diving tank. The furnace overflow level is used as open-air theatre and opera and film stage, and the gas turbine and machine halls are venues for concerts and theatre performances. Open spaces have been converted to enclosed gardens, sports fields, and playgrounds. Other areas of the park have also be adapted for new use, including casting halls, which are now used regularly for

art exhibitions, and administration buildings, which are used as a youth hostel and training centre. A catwalk zigzags across the site to afford visual access to the site.

In certain areas, vegetation conquers the industrial landscape. Trees and plantings are permitted to grow without interference, and plants of all kinds grow from seeds that were once inadvertently brought to the site by international shipments (Stilgenbauer 2005). By exposing decay, the indeterminate landscape expresses the broader project narrative: the ultimate subjection of the built environment to nature. Contaminated soil is restored through phytoremediation, while highly toxic soil is contained within underground bunkers.

- Findings**
- acceptance of existing conditions as starting point for design
 - strategic pairings of existing features and new program afford new experiences of inhabitation
 - programmatic choreography is limited to enable visitors to construct their own experiences and draw their own connections

Lifescape

Project: Lifescape, Freshkills Park Masterplan Competition Entry

Design Team: James Corner Field Operations

Year: 2005

Area: 2200 acres

- Summary**
- Freshkills Park is located in the New York City borough of Staten Island. Established as a landfill for the City of New York in 1948, Freshkills received thousands of tonnes of waste each day for over half a century. During peak operation, it accepted 29 000 tonnes of waste per day and employed nearly seven hundred people. It was closed in early 2001, but was briefly opened to accept debris from the World Trade Centre.

Lifescape, James Corner Field Operations' winning design entry for Freshkills, provides strategies for ecological development through a strategy of mats, islands, and threads. Mats include various ground cover conditions, including wetlands, marshes, grasslands, recreation fields, which aid in water retention and erosion control. Islands include protected habitat clusters of forests, program activities, and site furniture. Threads include trails, hedgerows, roadways, boardwalks, and earth-berms, which direct flows of people, material, and energy throughout the site. The design is careful not to distinguish between human activities and the natural ones of the site.

The competition entry presents a thirty-year planting schedule for the site. Tree plantings take advantage of the terraces of the landfill cover; they are planted at the edges of terraces, where the soil is deepest and it can take advantage of water collected in terrace centres. On a site scale, they are located on the northeast side of the mounds, sheltered from the wind, in order to establish the new environment. In opposition to the pleasure grounds, "(n)ature is no longer the image we look at, out there, but the field we inhabit and belong to, an active lifescape, where life below ground, on the ground, in the water, and in the air, is continually manufacturing new environments as it reproduces and evolves" (Corner 2001, 7).

- Findings**
- major time-based design strategies for organic landscape
 - exploitation of subterranean condition (through a gas collection network)
 - inhabitation of previously uninhabitable space

Parc de la Villette (OMA Competition Entry)

Summary While Bernard Tschumi's design ultimately won the competition of 1982 and has had a profound impact on architecture and park design, perhaps equally profound was the entry of OMA. The 550,000

square meter site of former slaughterhouses in northern Paris is divided into parallel bands of fifty-meter width that host many different programs. Lines of trees separate the strips and act as screens between them; viewed along the east to west axis, the park appears as fields, while viewed north to south, it appears as a densely treed area. Small supporting structures are distributed loosely across the site, and major programmatic elements are anchored in various locations. A boulevard – the primary circulation spine – connects the strips conversely from north to south.

Findings

The strength of this proposal can only be grasped in reference to its urban condition. The proposal offers a new kind of urban space for Paris – one in which a fantastic combination of program – including farming, grilling, swimming, golfing, kite flying, and fishing, among others – provides opportunities for exchange, confrontation, and mutation. In other words, the proposal celebrates the fragmentation of late twentieth-century urbanity. As a strategy, rather than a final design, Parc de La Villette is able to accommodate changing conditions and remain relevant over time. Additionally significant is the way in which the park blurs the boundaries between ideological categories of nature and artifice, organic and machine. In the proposal, nature is ‘here’ (within the city, a place traditionally understood as unnatural), rather than ‘there’ (non-urban areas), and it is shaped and even created by human means.

OMA’s vision for Parc de la Villette is relevant to the design of Rouge National Urban Park in its treatment of non-vehicular circulation, but more importantly its treatment of nature.

Shelby Farms Park Masterplan

Project: Shelby Farms Park Masterplan, Memphis, Tennessee

Design Team: James Corner Field Operations

Year: 2008

Area: 1821 acres

Summary

Shelby Farms Park is an important part of Memphis, Tennessee. Once home to a slave commune and then a penal farm (1929-1964), Shelby Farms is now surrounded by urban fabric. In 2008, the Shelby Farms Park Conservancy launched a masterplan competition to develop the hereto under-realized park. James Corner Field Operations' winning entry to the design competition revolves around the park as public space. It affirms public interest in recreation activities of many kinds. Using farming/growing as metaphor for the park, the design envisions higher intensity and variety of uses to shape a more defined and beautiful identity for the park as a whole. 'Natural' features – including an enlarged central lake – are created, and existing zones are enhanced to define twelve distinctive rooms within the landscape. These rooms are linked with an uninterrupted circulation route, along which is located the centralized arrival centre, which serves as an information and service hub for visitors, and departure point for explorations in the park. Corner proposes a hybridization of traditional land practices (agriculture, animal husbandry) and 21st-century health and recreation uses into a “new ecology of place”.

Findings

- intensity, rather than dispersion, of activities [reminiscent of OMA's entry for Parc de la Villette, Paris, 1982]
- celebration of the site's designed nature
- development of historic economic practices on site

Taichung Gateway Park

Project: Taichung Gateway Park

Design Team: Catherine Mosbach, Phillippe Rahm, & Ricky Liu

Year: 2012

Area: 168 acres

Summary The winning competition entry for the Taichung Gateway Park, Taiwan, demonstrates a novel approach to landscape architecture and park design. It attempts to provide opportunities for city residents to once again inhabit the outdoors comfortably, rather than remain within the confines of air-conditioned buildings. Invisible features of heat, humidity, and pollution on the site were mapped and thereby made visible. They were then overlaid, revealing a series of diverse site atmospheres. A catalogue of both high and low technology devices was developed to reinforce these existing conditions, or modify them to actively create new atmospheres. Devices – called meteors – include things such as trees and other vegetation (shade and water retention), atomizers, hydronically-cooled pavilions, noise-cancellers, dehumidifiers, and ultrasonic speakers to keep mosquitoes away. Programs are distributed throughout the park according to the concentration of these devices, based on mappings of heat, humidity, and pollution.

- Findings**
- mapping as creative act – it reveals invisible relationships, which can then be used as the basis of design
 - atmosphere, rather than space or structure, is the preoccupation of the architecture and landscape strategy
 - a combination of natural and built devices is used to achieve design goals
 - representation has a sense of magic, of intrigue, that is easily understood as part of the design strategy

Tree City

Project: Tree City, Downsview Park Competition Entry, Toronto

Design Team: OMA & Bruce Mau Design

Year: 2000

Area: 321 acres

Summary In 2000, the City of Toronto launched an international design com-

petition for the former Canadian Forces Base Downsview, north Toronto. This winning design for Downsview Park focuses on one of Toronto's most defining features: trees. Circular clusters of trees, which will eventually cover one quarter of the site, define the park's identity, and, rather than buildings, act as catalyst for urbanization.

Tree City exists as counterpoint to the dense downtown core. The park embraces its suburban context and offers space for the realization of the suburb's full potential. It serves as both destination, and agent of dispersal. Users circulate across the site by way of one thousand paths, which continue outside the park and connect to surrounding parks and ravines, thereby establishing an ecological network within the city. The site is also a transit node with access to subway, buses, GO transit, rail, and airport (though not currently for public travel]).

Unlike in traditional park models, Tree City's central infrastructure - trees - appreciate over time. As they grow, the park grows towards its full urban potential. Given the project budget, sequential development is proposed according to fund availability: (1) site and soil preparation; (2) pathway construction; (3) cluster landscaping.

- Findings**
- the design suggests a strategy for development over time
 - through study/observation, a defining, though often ignored, feature of the city [trees] is celebrated and becomes the basis of the entire project

Drentsche Aa National Landscape

Project: Drentsche Aa National Landscape,
Amsterdam, Netherlands

Area: 10000 ha

Summary The Drentsche Aa National Landscape is a unique member of the

country's network of national parks. While its heavy agricultural use [more than half of the total area] and residential function make it ineligible for the term 'National Park', it is nonetheless valued and celebrated as a representative landscape of the Netherlands. It is defined by the Drenstche Aa river, and supports various recreational activities.

Over 3500 archaeological sites document thousands of years of human occupation of the site. From Mesolithic hunter-gatherers who inhabited riverbanks, to farmers who cultivated the land and shaped it through the introduction of irrigation canals, the land has remained valued.

- Findings**
- The motto – “Conservation through Regeneration” (Nationaal Park Drensche Aa 2014, 30) – is forward-looking rather than nostalgic, committed rather than reactionary.
 - park recognizes and celebrates history of human occupation of the landscape
 - absence of central information node encourages multiplicity of entrance points and responsibility of local communities
 - while the park is a national landscape, and therefore does not adhere to strict conservation practices, approximately one third is a designated nature reserve

Underground Houses

Project: Underground Houses: An Air Terroir

Design Team: Philippe Rahm architects

Year: 2005

- Summary**
- Consistent with the preceding work of Philippe Rahm, including the winning design for Taichung Gateway Park with Catherine Mosbach and Ricky Liu, Underground Houses address the invisible conditions of space. Heat and humidity are the measures, while earth

is the content. The underground houses take advantage of the earth's constant eight-degree Celsius temperature for the passive heating of supply air during the winter and the cooling of it during the summer. Supply is introduced in the basement, where a hydronic slab supplements its heat. The programmatic elements of dwelling are arranged according to the sequence of airflow. Air flows in the following sequence: bedroom, living room, kitchen, and finally bathroom/toilets, where it is exhausted. Rahm (2005) writes, "[t]he ambition of this project is therefore to construct an architecture that maintains both physiological and sensual links with the terrain and with the soil; an architecture that is inscribed into the site and its geology". This is reflective of Rahm's broader manifesto: "Form and Function Follow Climate" (Clément et al. 2006, 39).

- Findings**
- exploitation of earth for seasonally-specific heating and cooling strategies
 - place-making is established through building technology, not form or material strategy
 - spatial organization of dwelling is subservient to building systems

Appalachian Trail

Project: Appalachian Trail, eastern USA

Design Team: Benton MacKaye

Year: 1921

Length: ~3500 km

- Summary**
- The Appalachian Trail is an idea conceived by the technocrat, Benton MacKaye, as an alternative to the centralization of power within metropolitan areas. Rather than organizing economy and industry around a motorway or railway, the AT has as its spine a pedestrian network, which branches out to railways, highways, and metropolitan areas. In her book, *Organization Space: Landscapes, Highways, and Houses in America*, Keller Easterling summarizes

the project's aims in this way: "An infrastructure of land or 'super national' forest and a network of compact communities and industries would crystallize around the footpath to replace the suburbs. The interstate geological formation of the Appalachian ridge would function as a kind of public utility or reservoir of natural resources, organizing transportation and hydroelectrical networks while locating industry and community. The trail idea proposed no master plan but rather an ordering principle for a new economy" (Easterling 1999, 25).

MackKaye championed a notion the notion of network regionalism, which proposed a "network of cities of different forms and sizes, set in the midst of publicly protected open spaces permanently dedicated to agriculture and recreation" (Keller 1999, 46). Rather than concentric circles of development of the metropolis, he proposed the natural world – particularly fluvial geomorphology and resources – as ordering principles for cities.

- Findings**
- economy organized by site, rather than site organized by economy
 - an alternative to the unsustainable metropolis

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