City of Vaughan

Vaughan Healthcare Precinct

Landscape Development Concept

July 2015

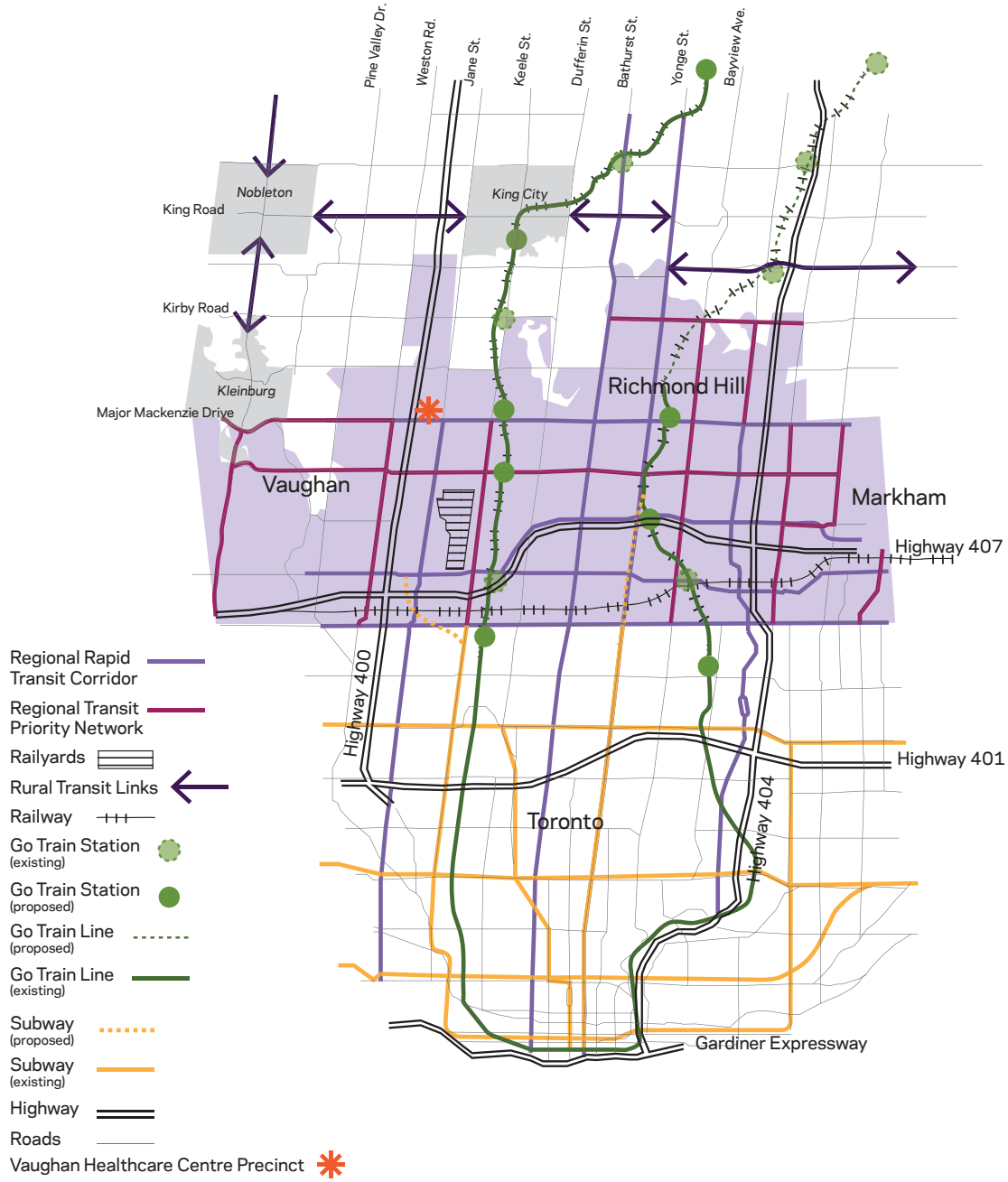
Contents

Landscape Background

1

Precinct Overview

Transportation Map



Site Overview

The Vaughan Healthcare Centre Precinct is a prominent 82 acre site located in Maple at the northwest quadrant of Major Mackenzie Drive and Jane Street. As a "Primary Centre" in the Official Plan, the site will evolve as a pedestrian friendly, transit oriented, urban, mixed-use health and wellness precinct, anchored by the new Mackenzie Health Hospital.

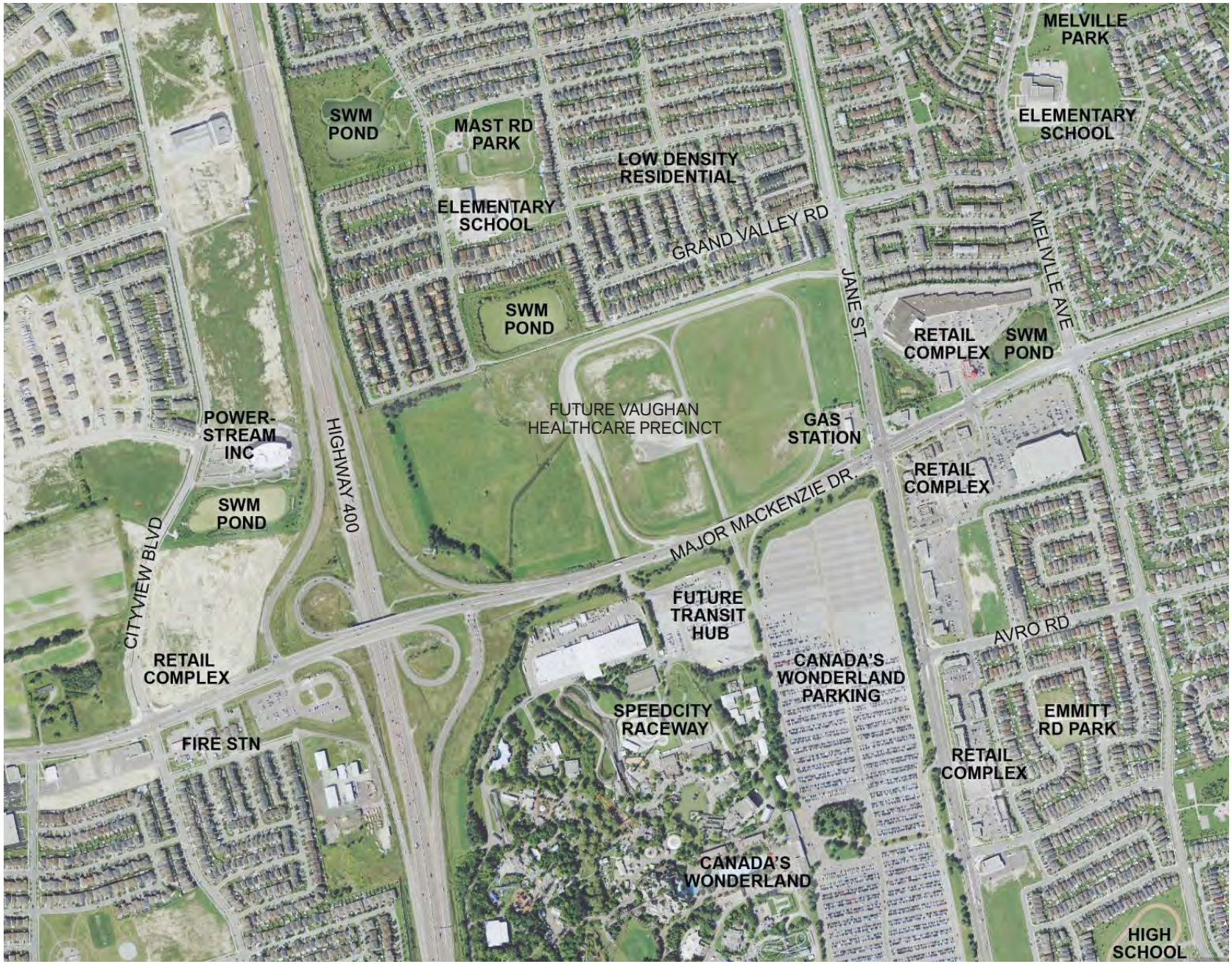
Planned Transit Facilities

- Regional Transit Hub on the south side of Major Mackenzie Drive
- Regional bus rapid transit (VIVA Network) planned along Major Mackenzie Drive and Jane Street (first station stops in 2017)

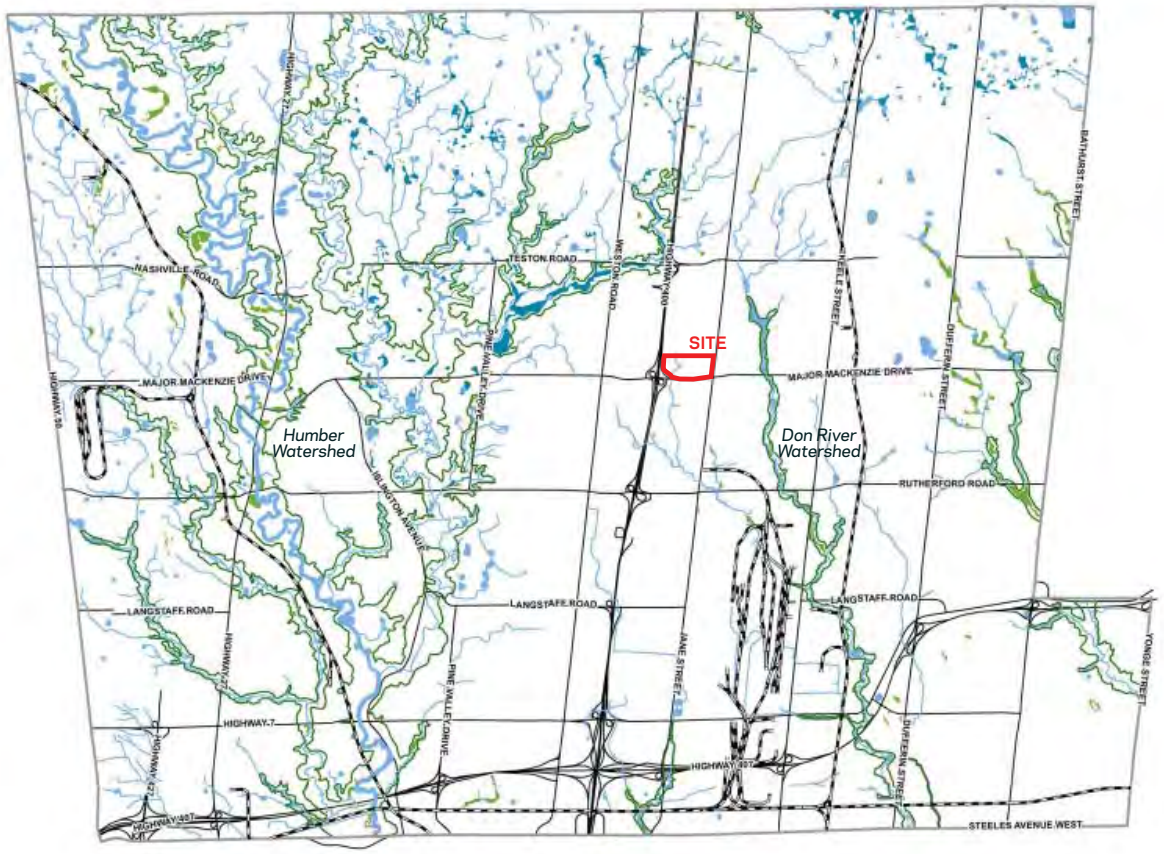
The City of Vaughan is moving ahead to prepare the site for sustainable urban development, which includes putting necessary municipal infrastructure in place to support the new hospital site and future developments.

Context

Site Aerial (2014)



Hydrolic + Ravine Network



Natural Heritage Network Study, Schedule 2A
(North South Environmental, May 2014)

The Precinct Site is located directly below the headwaters Oak Ridge Moraine where a small stream feeds one of the largest ravines running south to Lake Ontario- the Don River.

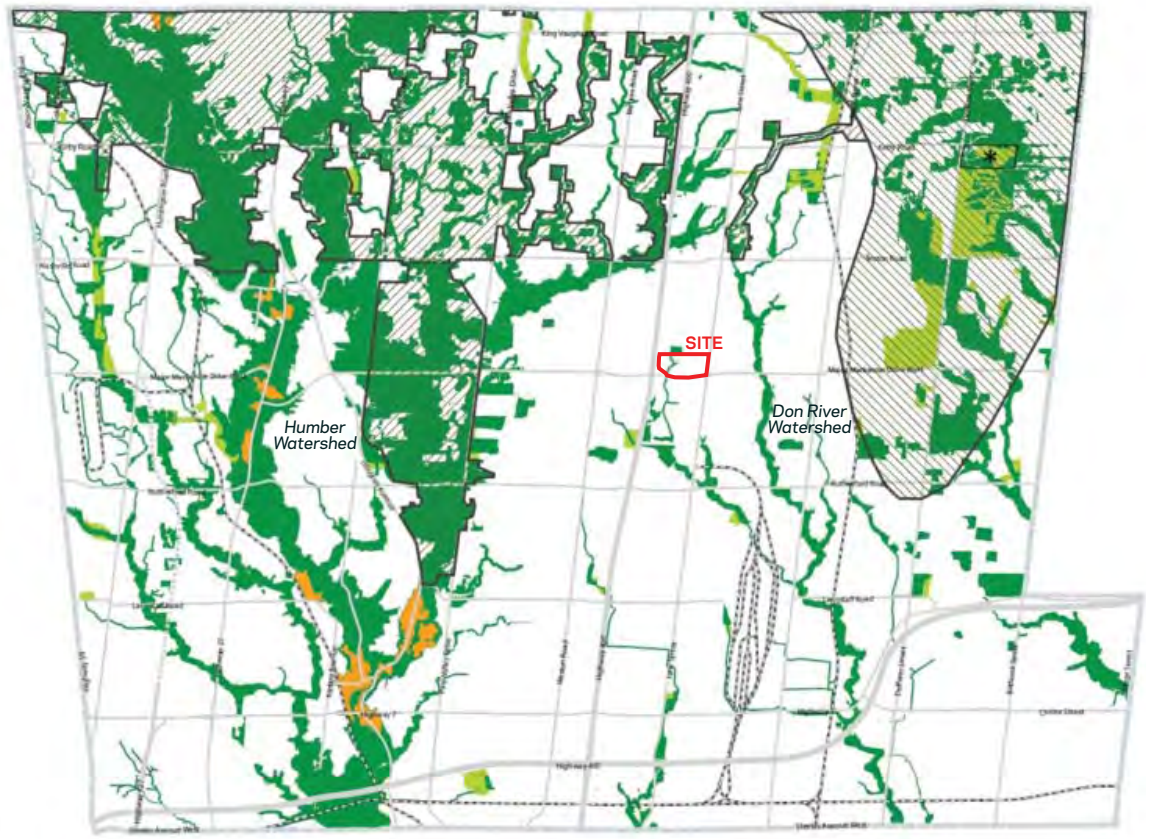
The VHCP site is a sensitive point of connection, feeding the upper west arm of the Don with clean cold water of these vast aquifers.

The site today functions imperfectly- an undeveloped greenfield, it is fragmented by a regional transportation infrastructure, low and mid-density housing, protected agricultural farmlands and greenbelts. As a future urban centre, the VHCP is perhaps one of the best examples of the opportunities and challenges associated with a new type of 'hybrid' urbanism required to negotiate the complex landscape of the GTA.

The natural environment is among Vaughan's most important and cherished assets. The Humber and western Don Valley systems are prominent on the City's landscape and the overall health of those systems is reliant on the stewardship provided by Vaughan.

The watercourses, woodlands, wetlands and related open spaces and agricultural lands each have an important function in maintaining ecological vitality and diversity in the City. (VOP 2010).

Natural Heritage Network



Natural Heritage Network Study, Schedule 2
(North South Environmental, Feb 2014)

The VHCP Development Framework must be informed by high functioning landscape strategies which reinforce the 'systems approach' to natural heritage planning as outlined by the Vaughan NHN study (2014).

For the Healthcare Centre Precinct this means, planning with a broader understanding of natural hydrology, headwater drainage features, ecological enhancements and resiliency. Given the scale and scope of development, intensification of the precinct lands has significant implications for Vaughan's natural heritage networks—particularly for those valley lands downstream.

The VHCP Landscape Development Concept considers the importance of maintaining and protecting:

- **Ecological Features** in the environment such as woodlands, wetlands and watercourses, etc.;
- **Ecological Functions** of the environment such as water storage and water quality enhancement by wetlands, winter deer yards provided by dense cedar woodlands, amphibian breeding habitat in ephemeral forest ponds, open country or grassland habitat for birds provided by meadowlands, etc.; and
- **Ecological Interactions** that occur over varying scales of time and space such as animal predation and herbivory, the daily, seasonal and long term movement patterns of plants and animals, and the ecological role of natural disturbance mechanisms such as fire, wind, water, and disease, etc.

Site Conditions

Existing Site Features

Site Conditions

A: View from Future Stormwater Pond

B: Existing Canada's Wonderland underpass

C: Existing Chain Link Fence

D: Existing Board-on-board fence

E: Mast Road Culvert

F: Existing Channel

The City of Vaughan is moving ahead to prepare the site for sustainable urban development, which includes putting necessary municipal infrastructure in place to support the new hospital site and future developments.

Road Network, Topography & Land Cover

Generally flat, the precinct has a slightly declining slope from north-east to south-west. With an existing underpass to Canada's Wonderland, the grade will fall as much as 6m at some points. The west portion of the site is lower than Mackenzie Drive. Access to Canada's Wonderland exists through ring roads that run through the precinct.

There are two existing underpasses to Canada's Wonderland which provide one westbound access route to Major Mackenzie from the eastern most underpass and another route to north and east of Jane Street from the westbound underpass.

Just north of the ring road is a strip of green space and a high board-oboard and chain link fence, allowing a buffer strip between the precinct area and the neighbouring community.

A berm, approximately 3 m high, is located along the northwest edge of the precinct plan as well as along the west edge, adjacent to Highway 400. A cluster of trees can be found on the north and west edge of the berm.

A channel crosses the precinct flowing north to south. This carries runoff from the precinct and the stormwater management pond located just north of the precinct. The channel ends in a culvert under Major Mackenzie Drive.

Conservation Areas

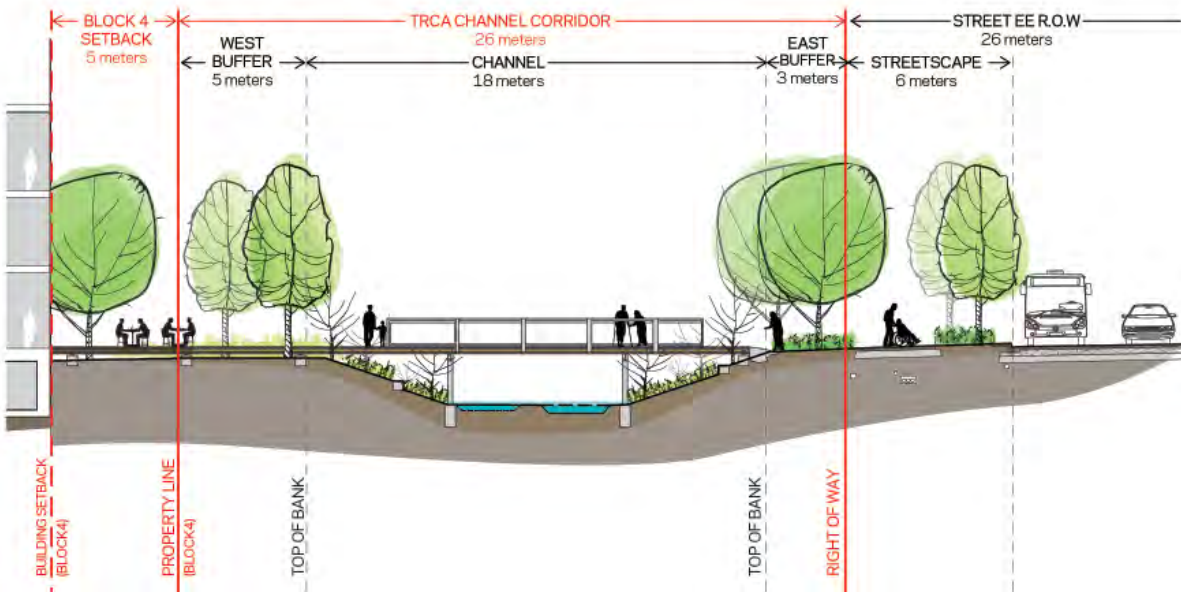
Stream Channel & Stormwater Ponds

Key Map

The stream restoration and pond will be defining landscape features of the Precinct, designed with layers of stormwater management, ecological restoration, and public space features and functions.

Site Conservation Areas

Section AA: Precinct Channel



Existing SW Pond North of Precinct

The Landscape Design component of these features have been coordinated with stormwater infrastructure and stream restoration works (water resource engineers, fluvial geomorphologists and ecologists).

All TRCA base requirements have been successfully met as part of the landscape strategy and Phase 2 landscape design strategy:

- The channel and culverts will be designed to safely convey Regional Storm design flows.
- The ecological restoration area is defined as the space from top of bank to top of bank.
- SWM Pond with a naturalized look with ephemeral pools along the pond edge.
- SWM Pond edge planting strategy to be developed for submergent and emergent zones as well as pond shoreline and riparian fringe. Frequent flooding mark at 226.51.
- The heating effect of SWM ponds is an environmental issue and therefore the introduction of shading strategies and floating islands may help to mitigate.
- A low maintenance approach for both the corridor and buffer should be a guiding principle for the design.
- Desire for small, permeable pathways over concrete, and naturalized plantings over formal planting approach for a low maintenance system.
- TRCA requires the use of native, non-invasive plant species for all plantings.

For the Channel Restoration, the TRCA specifies minimum 10 m setbacks :

Landscape Architecture scope for channel area is 6.5 m Street E west boulevard, 3 m buffer east of the channel, 5 m buffer west of the channel and 5 m building setback further west. (Refer to Section AA)

VHCP Vision Workshop

In July 2014, HOK lead a Visioning exercise with City of Vaughan Development Planning, Capital Planning and Infrastructure, Cole Engineering, TRCA and York Region.

HOK presented a concept framework plan with a set of design moves, proposed programme elements and critical diagramming of systems and design criteria to test the opportunities and constraints of the plan, context and scenarios for future build out.

Existing Precinct Site

Open Space Vision & Framework

Healthy Urbanism

Healthy Urbanism Principles

Healthy Urbanism is a term used to facilitate planning principles that encourage healthier and more diverse urban environments in combination with more sustainable building practices. This is a holistic approach that brings together macro and micro scale planning principles and best practices that layer land uses and connectivity in order that urban and natural systems can coexist.

The framework is typically established by the watershed, topographical conditions and biome distribution that sets the basis for a healthy and connected environment. The urban form is arranged within the natural environment allowing natural systems and urban infrastructure to operate with minimal interruption or disturbance.

This framework enables more concentrated urban developments that strive for a greater emphasis on multi modal transportation and less emphasis on vehicular mobility. Pedestrian and cycle transportation is prioritized to ensure a safe and welcoming environment with less interface to vehicular traffic. Often these routes can be included in the natural systems and act as short cuts not available to vehicles.

By encouraging a wider cross section of the public to be active on a daily basis, the demands on healthcare are reduced and more urban area can be dedicated to public spaces storm water retention and infiltration or development or green space. Fewer vehicles result in cleaner air, quieter spaces and a safer environment.

The development concept for the Vaughan Healthcare Precinct establishes a clear framework that leverages a strong Healthy Urbanism approach. The restoration of the water course through the site, coupled with the strategy to create a more naturalized storm water aquatic zone creates greater natural diversity and allows for necessary wildlife corridors throughout the watershed. The linear system of the water courses combined with designated pedestrian and cycle corridors increases the critical mass of open space.

Greater connection to the outdoors and easier connectivity between buildings and plots are further achieved by an emphasis on the public realm and the creation of a hierarchy of outdoor connections. By creating accessible connections to courtyards and plazas, the public realm becomes a viable corridor that can be used throughout the year by a wider range of people.

This is a holistic approach that brings together macro and micro scale planning principles and best practices that layer land uses and connectivity in order that urban and natural systems can coexist.

Healthy Urbanism in Design

How can a master plan create a healthy environment?

Design

- Connections through pedestrian & cycle routes to neighbourhoods and public transport create a complete framework for healthcare and better living
- Design inspired by rural landscape (meadowlands, hedgerows and remnant woodlots) that once defined Vaughan's physical character promoting a connection with nature and history

Sustainable Approach

- Establish a green framework for future development
- Landscape systems begin to replace traditional approaches to stormwater treatment
- Permeable pavements and more green space accommodate more resilient urban environments
- Leveraging LEED standards and best practice as a guideline for green infrastructure

Experience

- Design incorporates enclaves of quiet zones sheltered from urban noise.
- Native species and landscape corridors allow for a diversified environment in an urban context

Health and Wellness Landscapes

Health and Wellness Themes

All landscape must be designed through a lens of health and wellness. As a reoccurring theme, health may be extended to (a) community health, (b) ecological health, and (c) individual's health, often as an emotional experience of the landscape.

Restoring the Spirit

The precinct's network of space should serve to restore the spirit and inspire the mind. Beyond the singular 'healing garden' typology, the strategy embraces a broader holistic approach to building landscapes for health.

For example, connectivity of landscape aims to support exercise and fitness in the community. An integrated system of well-appointed multi-use trails, pond loop paths and nature walks may encourage outdoor activity for a range of users.

Site sensitive design embraces beauty and the sublime where ever possible. Inspiring views should be featured from major gateways and buildings, but also to visually connect the open space network, reinforcing it as one fluid experience.

Green spaces should be ample and accessible while water resources should be featured and symbolically celebrated for its healing and meditative qualities.

Design for human-scale, intimate moments should embrace tactility, fragrance, light and seasonality of the space. Landscapes should not ignore subtleties such as bloom cycles, winter interest, sunlight and sounds.

Environmental Wellness

Moving beyond the anthropocentric view of health, the open space strategy must safeguard environmental health. Open spaces are designed as self-sustaining ecologies, but moreover there is a strong awareness of the Precinct as a feeder site for larger regional landscape systems.

Open Spaces function as native seed banks and wildlife cradles for adjacent woodlot patches and sites downstream.

Regardless of landscape typology, size, ownership, or phase of development, each should be treated with the same awareness for ecosystem support and broader ecological health.

Depending on the site, this response might manifest itself in small ways, (habitat boulders, bird-houses) or through larger landscape interventions (such as constructed wetlands, or innovative maintenance regimes).

Water is a key thematic component of the precinct. The stormwater ponds and naturalized stream corridors are treated as major destinations for urban life. Future development should also look to using a variety of strategies including rain gardens, bio-filters, parking swales, or even features such as fountains, runnels and/or pools which recharge groundwater, filter, or store runoff for on-site use.

Community Wellness

Here, community health may be understood as the level kinship, community spirit, and collective ownership of the Precinct.

As a health and wellness community and home to the Mackenzie Health Hospital, the public realm and complementary amenity spaces must equally accommodate individuals who live and work in the precinct, and those visitors who might visit only briefly. An inclusive sense of community is only possible if open spaces reinforce accessibility for all users.

Precinct landscapes must welcome intuitive exploration, but must also serve the programmatic needs of those people who experience it daily. In all instances, public realm features should consider those with limited mobility, the elderly or disabled users.

Amenity spaces should be designed to complement and enhance the public realm, maximize accessibility and legibility as community-serving spaces. The landscape framework encourages the consideration of a diverse range community-building programs. For example- children's play, picnicking, community gardening, seasonal markets, and outdoor gathering.

Self Sustaining Urban Ecology

The Vaughan Healthcare Centre Precinct Landscape Strategy integrates ecological principles into all aspects of landscape design. This strategy focuses on development of multifunctional landscapes that not only support vibrant community life, but provide a high level of ecosystem service.

Landscape create opportunity for habitat creation, species diversification and sustainability features where ever possible. Storm water is systematically treated as an amenity and resource across a wide range of landscape conditions and typologies.

Taken alone, individual elements might not appear to have a large impact, but when considered together as part of an integrated landscape, the contribution may be significant.

Conservation Lands

The precinct supports large patches of native vegetation for conservation purposes. These efforts include preserving remaining patches, restoring those that once existed, and providing connectivity between them.

Native communities (such maple-beech forests, woody hedgerows, or old field meadows) are to be featured across the precinct and operate on principles of ecological succession. The dynamics of each ecological structure should be made visible to the public through educational + interpretive measures.

Public awareness and understanding will be key for the ongoing support of both permanent and temporary landscapes.

The Urban Realm

There is enormous opportunity for long term sustainability of the urban matrix through intelligent application of high-functioning planting and landscape systems.

VHCP network of streets embrace multi-tier planting structures which not only support a rich diversity of species but reinforce a memorable aesthetic and sensual experience for visitors and tenants.

The precinct's matrix of landscaspe spaces –both small and large- work together to create rich spatial heterogeneity through the addition of semi-natural planting, storm water features, and landscape elements designed to provide multiple ecosystem services.

Planting Strategy

Planting areas must be designed and maintained with the understanding that plants are not purely decorative, nor are they static design elements. The use of perennials in public spaces is an emerging strategy that has enormous potential as a sustainable site strategy, being economically efficient and low in maintenance. The precinct aims to break tradition from the public realm's longstanding tradition of manicured shrubs, large trees and lawns as finished and unchanging components.

Precinct landscapes feature hybrid naturalistic softscaping with high ecological values. Vegetation should supports highly diverse plant communities with an emphasis on native and native plant cultivars.

Harmonious plant communities should be roughly structured and allowed to change over time.

This planting strategy is only sustainable for the long terms through a continual process of change: self-seeding, competition, spontaneous growth, death and regeneration.

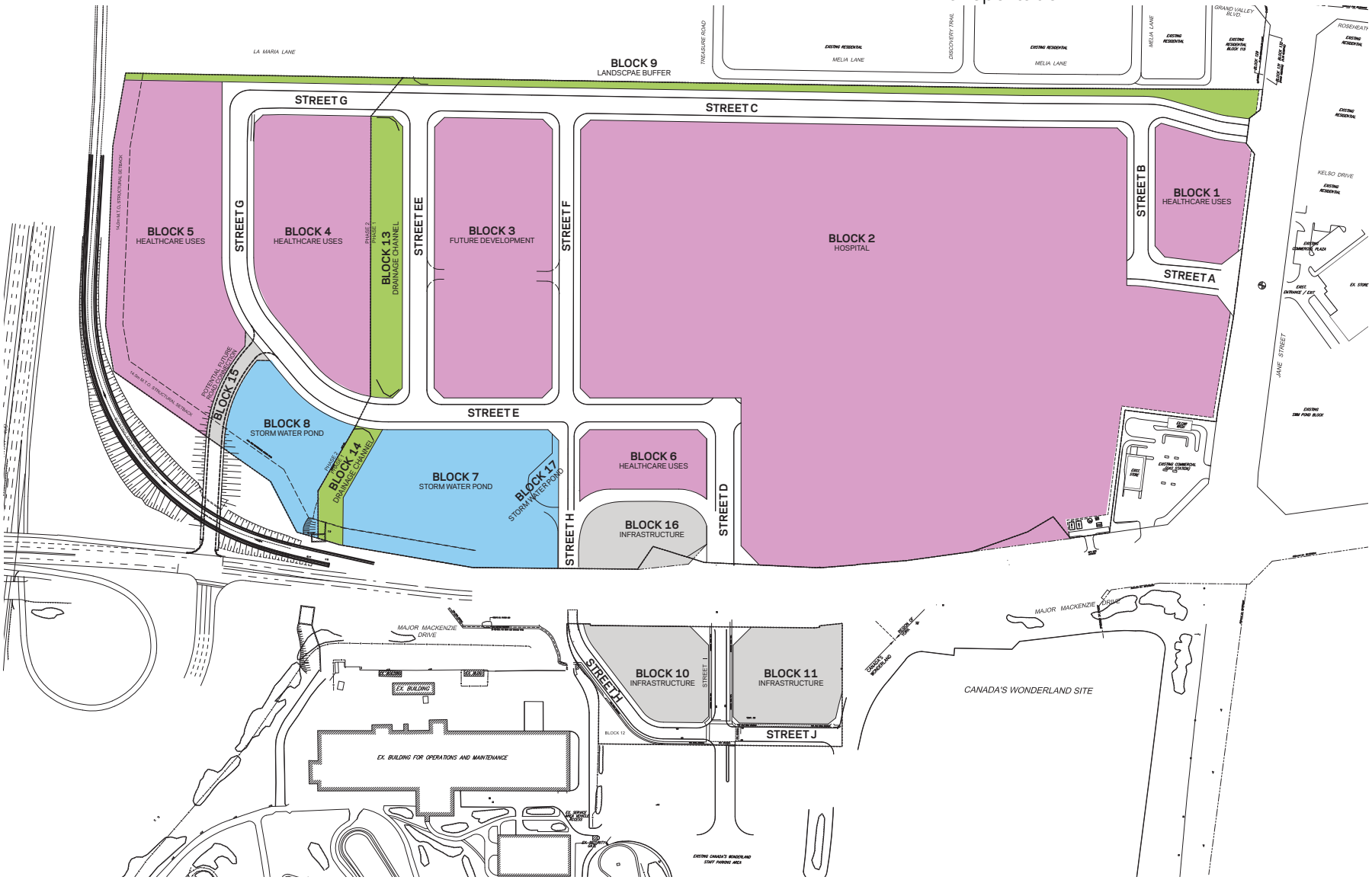
Aspects of organic gardening should be considered for these types of naturalized planting schemes, particularly as they rely on healthy micro-fauna and soil replenishment for long term success. The VHCP maintenance manual further outlines maintenance and care of precinct plantings.

Beyond simply a naturalistic planting style, the Precinct employs strategies which reduces water consumption, improves biodiversity and creates valuable habitat, even within highly urbanized pockets.

Precinct Land Use Plan

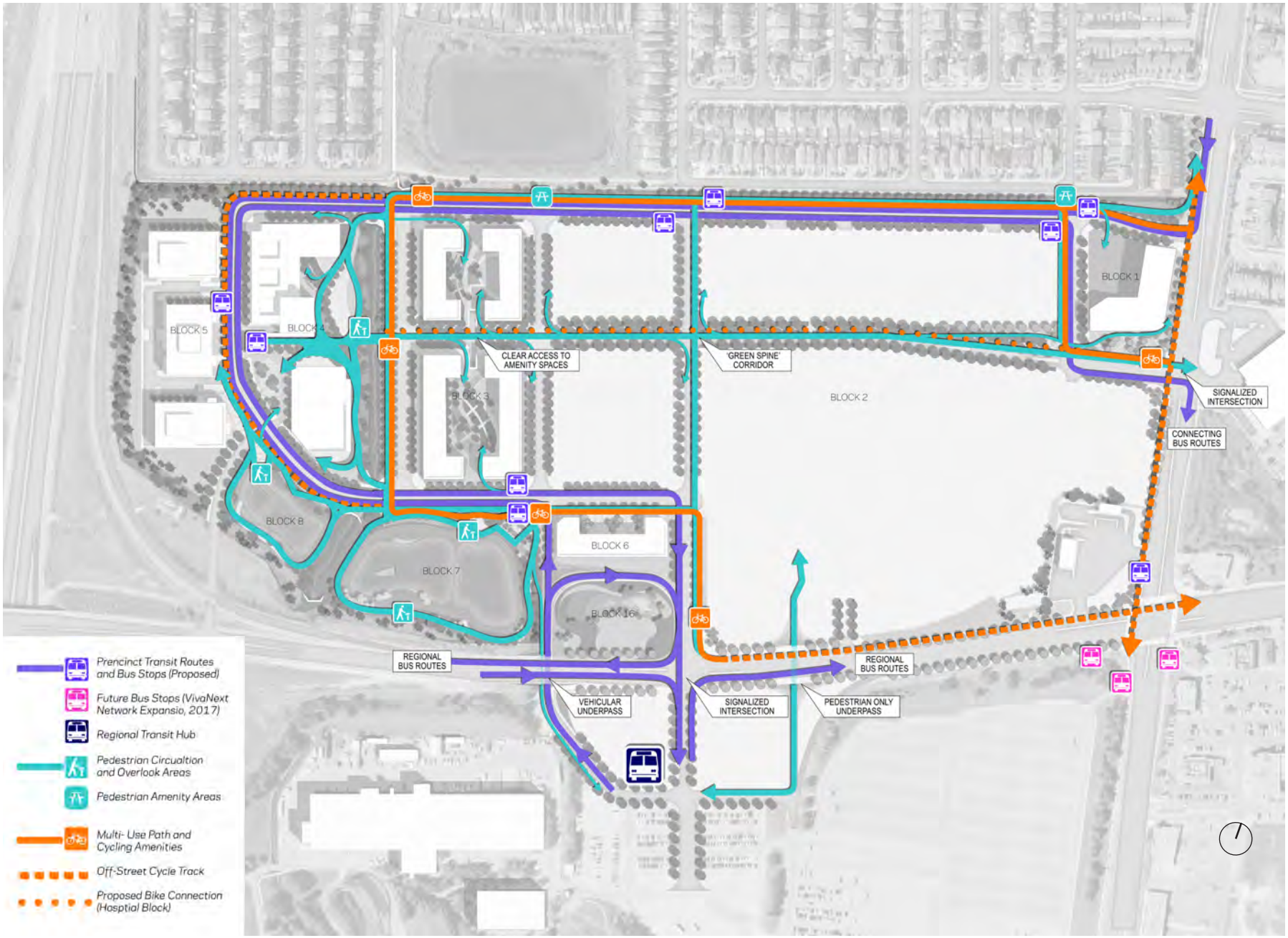
Draft Plan of Subdivision - Streets, Blocks, and Land Use

Refer to Vaughan Healthcare Centre Precinct Plan (Nov 2013) complete information on Land Use, Street Network, Servicing, Sustainability, Urban Design and Transportation.



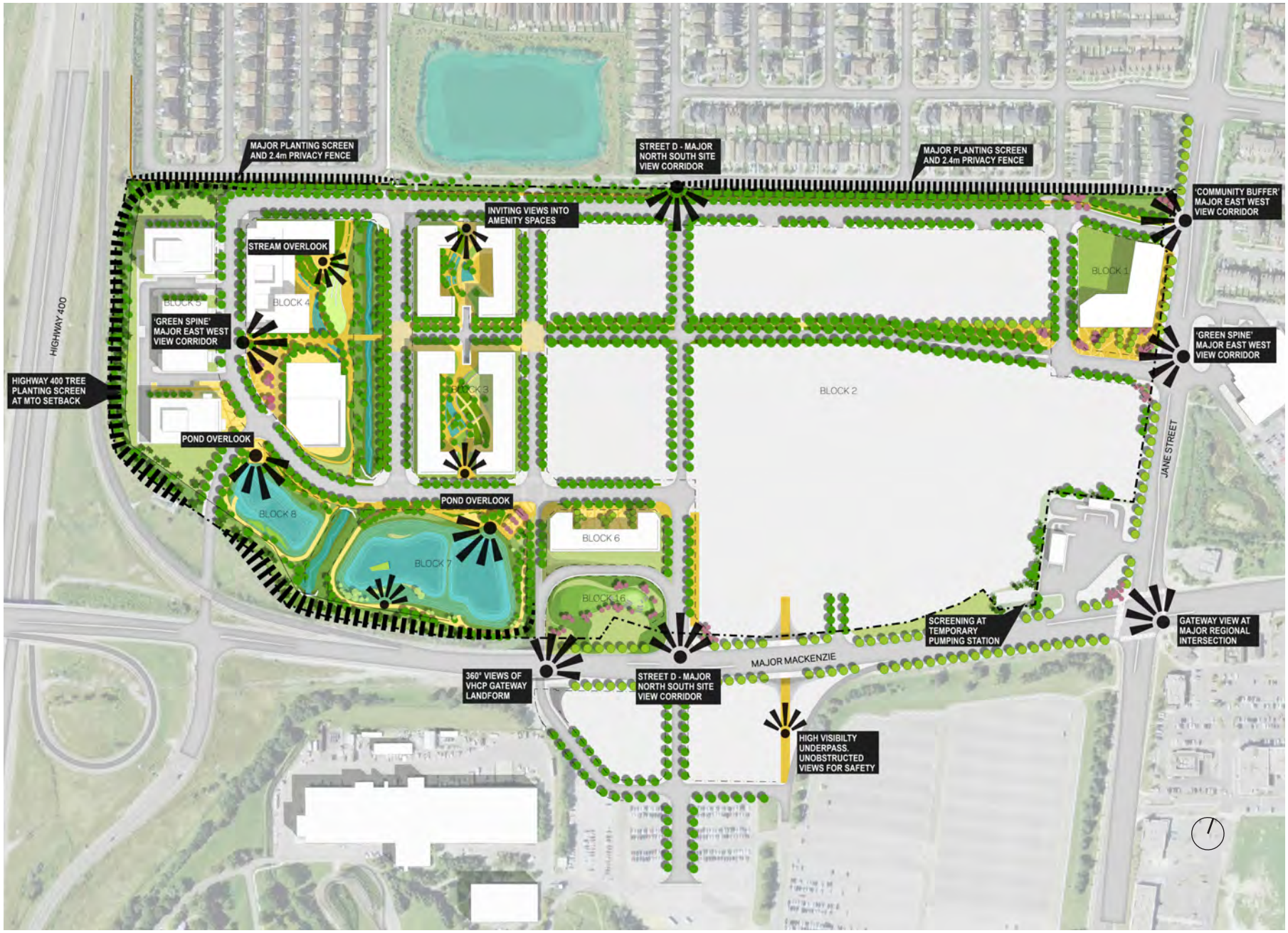
Pedestrian and Cycling Connections

Circulation



Site Views and Vistas

Critical Viewsheds



Landscape Framework

Open Space Organization

Organizing Spines

Active Amenity Spines reinforce strong east-west connections across the precinct. A variety of piazzas, promenades, and vibrant gathering spaces are interconnected to form a cohesive open space 'backbone' to support vibrant community life.

Passive Buffer Spines define the north and west perimeter of the Precinct. Dense vegetative screens are an important element to (a) buffer unsympathetic land use and (b) shield adjacent neighbourhoods from future development activity

Urban Wilderness

A strong ***Water Narrative*** is central the Precinct's Open Space Plan. As valuable natural resources, the Precinct's stream and ponds focus for community gathering, health and wellness activities in the Precinct

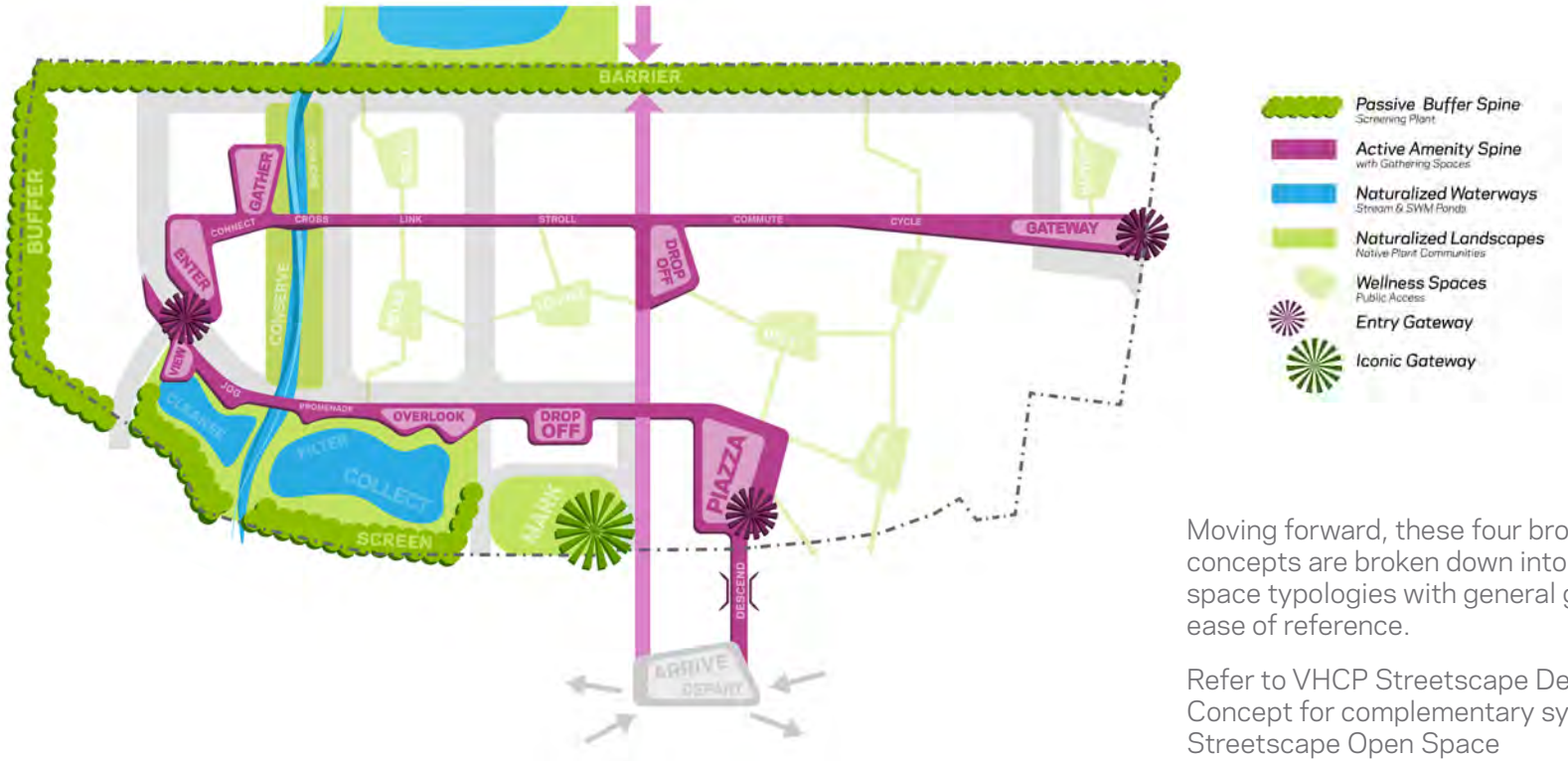
Rich and robust **Naturalized Landscape** bisects the precinct, cultivating ecological value and a distinct character for the precinct. These loose, wild landscapes serve as a striking counterpoint.to the ongoing intensification the urban fabric.

Gateways

Gateway features are an important landscape strategy which reinforce the Precinct's identity and sense of place. The plan identifies several key moments where arrival/entrance is should be celebrated.

Accessible Amenity Spaces

A fine-grained system of amenity spaces should be interconnected, fully accessible, and well-integrated with the public realm Each development block is responsible for integrating high quality landscape destinations which reinforce the Precinct's wellness and sustainability themes.



Moving forward, these four broad landscape concepts are broken down into specific open space typologies with general guidelines for ease of reference.

Refer to VHCP Streetscape Development Concept for complementary system of Streetscape Open Space

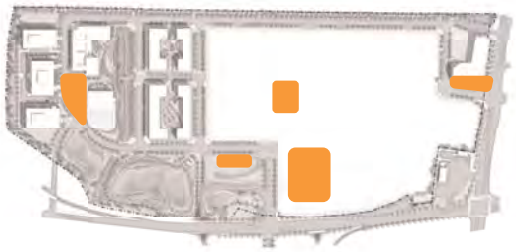
Landscape Development Concept

Open Space Typologies

3

Open Space Typologies

Amenity Spaces *illustrative locations



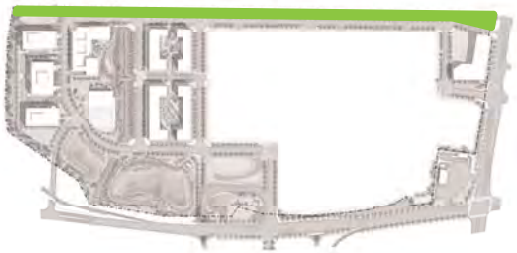
PRECINCT PIAZZAS

HEALTH + WELLNESS SPACES

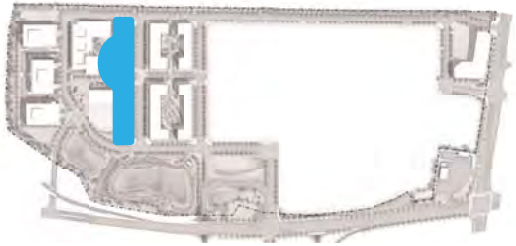
The landscape framework identifies seven (7) different types of open space. These include the Public Realm and Amenity Spaces

The 2 typologies for amenity spaces (Precinct Piazzas and Health + Wellness Spaces) should complement and connect with the public realm in terms of the location, pedestrian connections, views and landscape program.

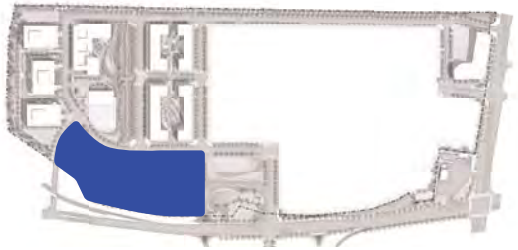
Public Realm



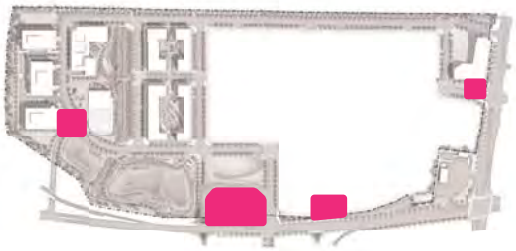
COMMUNITY BUFFER



RIPARIAN BUFFER



STORMWATER PONDS



PRECINCT GATEWAYS

TEMPORARY LANDSCAPES

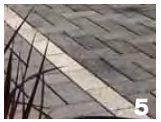
Design Component Matrix

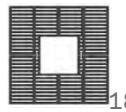
Paving → *Walls & Features* → *Seating* → *Site Amenities* →

COMMUNITY BUFFER - Public

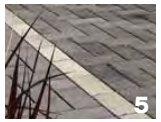
RIPARIAN BUFFER - Public

STORMWATER PONDS - Public

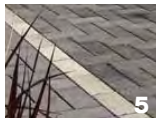


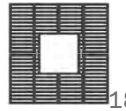


PRECINCT GATEWAY - Public

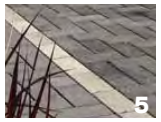


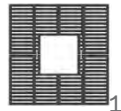
PRECINCT PIAZZAS





HEALTH +WELNESS SPACES

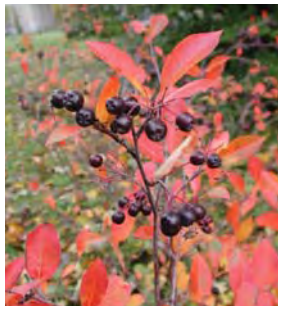




1. *Standard Concrete Paving* Broom Finish And Sealed
2. *Hardwood Decking* FSC Certified, Natural Weathered
3. *Crusher Limestone*
4. *Welded Bar Grating* Stainless Steel, Heel Safe
5. *Unilock Ecopriora Pavers* Santa Fe Colour
6. *Pea Gravel* Angular
7. *Unilock Umbriano Pavers* Midnight Sky, Winter Marvel Colour
8. *Armour Stone Walls* 600x400x1200
9. *Gabion Walls* Macaferri Woven Wire Mesh Baskets With Hand-Stacked Split Face Limestone
10. *Dimensioned Granite Paving.* Sawn, Flamed, Diamond 10, or Diamond 100 Finish. Grey, White, Green.
11. *Habitat Boulders* Natural Limestone
12. *Escofet Borne Icaria Barriers* Etched White Finish
13. *Wood Block Seating* Reclaimed Wood; Natural Finish
14. *Escofet Milenio Bench* Etched White Finish
15. *Landscape Forms Select Litter Bin* Perforated Faces; Contrasting Stormcloud Grey +Silver Colours
16. *Santa Cole Bancal Bench* Min 168" Length. Ipe Wood; Stormcloud Colour.
17. *Landscape Forms Chipman* Dining Tables and Chairs; Bar Height Tables and Stools, Various Colours.
18. *Tree Grate* 200 Tryston Graphite Colour
19. *Landscape Forms Sentinel Bollard* Stormcloud Colour.
20. *Metalco Fuente Drinking Foutains*
21. *Landscape Forms Bola Bike Rack* Stormcloud Colour.
22. *Landscape Forms Flo Bike Racks* Stormcloud Colour.

Community Buffer



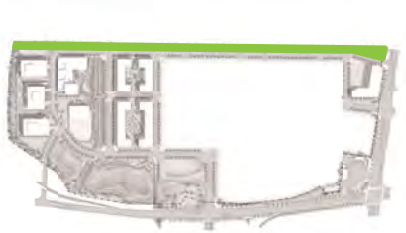













Community Buffer Key Plan

Community Buffer
Planting Plans

View AA - Existing Condition

2.4 m Wood Privacy Fence with Gravity Retaining Wall along VHCP Property Line

Planting Buffer -Layer 1

Tall Hedgerow Screens: *Carpinus Betulus, Fagus sylvatica, Amelanchier, Fotherillia; Rhus, Abies, Pinus, Juniper sp.*

Planting Buffer - Layer 2

Double Row of Large Canopy Shade Trees: *Red Maple, Beech, Oak, London Plane*

The predominant use of Sugar, Red and Hybrid maples trees reinforce the collective memory of local agriculture and sugar shacks once populating the area. At one point in time, many of the local farm roads were characterized by long alleys of Red Maples in this aptly named "Maple" community.

Community Buffer

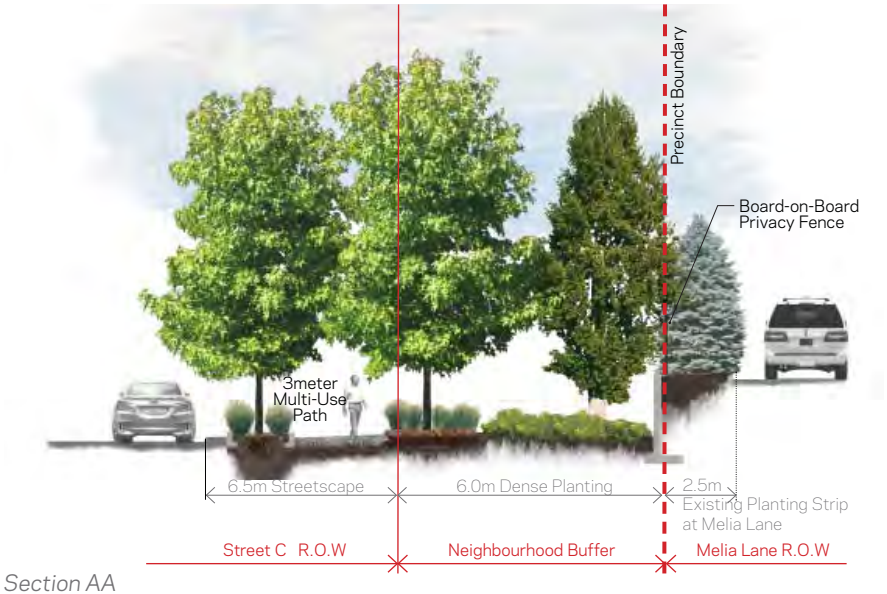
Neighbourhood Buffer Sections

The primary purpose of this open space typology is to visually buffer the hospital and central utility plant from the south limit of 'Maple View Farm' residential subdivision. To create a robust buffer, this 6m strip running along the north side of Street C is heavy planted with multi-tiered vegetation: broad canopy trees, well-developed shrub understory, and low maintenance meadow grasses.

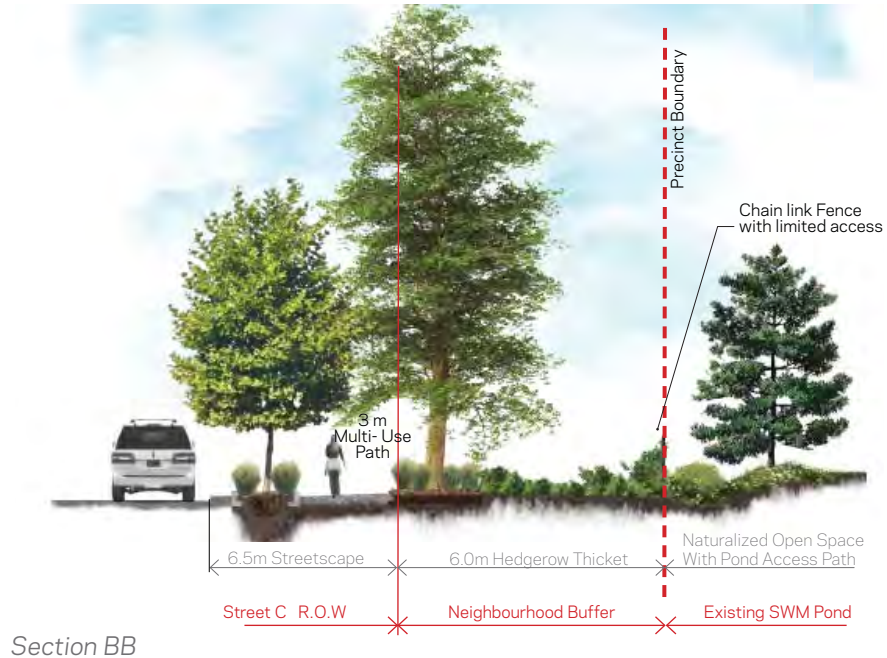
To provide additional screening, the existing privacy fence (2.4m height) has been densely planted with woody hedgerows species- such as chokecherry, witch alder, and brambles. Unlike more commonly used cedar hedging, the loose woody structure and berries of these hedges provide wildlife refuge, food source, and seasonal variation for a richer ecological edge to the precinct.

Planting rhythm along this one kilometer buffer is dictated by the adjacent neighbourhood street grid and open spaces. Tight stands of evergreens mark the terminus of Melai Lane, Discovery Trail, Treasure Road. Tall Beech and Hornbeam trees are located where houses may require additional screening. Lower brambles+ berry patches are planted adjacent to the existing pond in order to allow visual connection to this open space.

Apart for the primary purpose of screening hospital development, the buffer also functions as a major multi-use path / cycling corridor. Rest stops and amenity nodes serve both cyclists and pedestrians moving through the space. Moments of delight (such as spring bulbs plantings, berry patches and bird houses) further enhance the experience of this corridor, encourage community investment and year-round use.

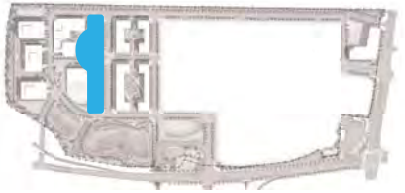


Section AA



Section BB

Riparian Buffer
Riparian Corridor Character



Riparian Buffer KeyPlan

Riparian Buffer
Gathering Terraces Plan Enlargement

Concept Demonstration Plan

(A) Bridge

(B) Stream Corridor

(C) Boardwalk

(D) Soft Terraces

(E) Interpretive Node

(F) Service Area

The design team worked closely with the TRCA and engineers to re-vegetate and naturalize the stream banks. Using entirely native plants, the corridor features a diverse mix of species, including dogwood, viburnums, ironwood trees and a variety of locally sourced native oak. Moister species along the base of the channel and mingled with stone outcrops, stream whiffles and ephemeral pools, all supporting a rich riparian habitat.

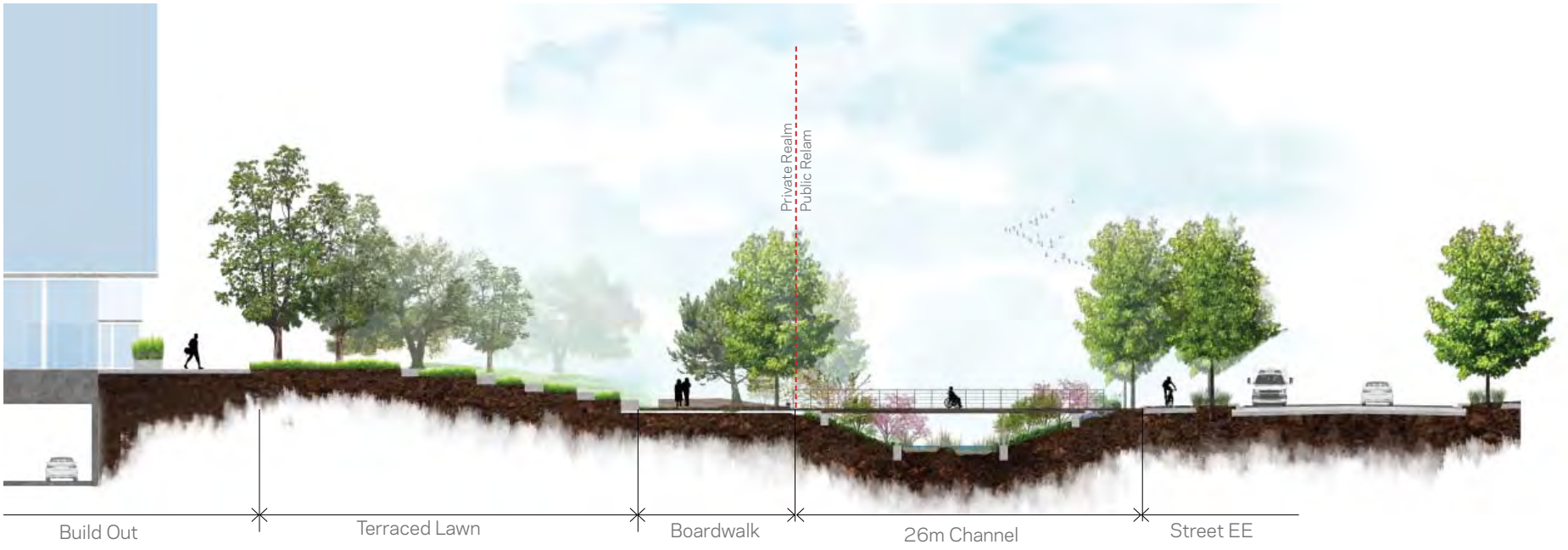
Future development frontage and public pedestrian access on the west side of the stream (Block 4) will be critical to the success of the stream as a public amenity and defining feature of the Precinct

To further protect and capitalize on the beauty of this restored watercourse. Special care must be taken to build additional buffer space (apart from TRCA minimum buffer area) as outlined in the precinct plan.

Buildings should be setback at least 10 meters from the top of bank (5m buffer+ 5m setback) to allow for a contiguous boardwalk condition to animate the east side of the channel with interpretive, gathering, or food + beverage opportunities (refer to stream section).

Block 4 architecture should be designed with active frontage onto the riparian buffer. Back-of-house and service areas should not be situated against the stream corridor. Instead, building amenities (such as cafeterias, lounges, or recreational facilities) should have direct access to the buffer, with capacity to spill outdoors during warmer weather.

Riparian Buffer
Gathering Terraces Section



Section AA

Edges of podium structure may be terraced to provide seating and vantage of the stream. Picnic lawns might provide informal space for gathering, while a contiguous boardwalk structure might serve as a restful nature walk. Interpretive signage or artful installations may be used to highlight aspects of stream's flora and fauna. Refer to representative plan for how a variety of program elements may be implemented on site.

A proposed bridge should allow for direct pedestrian and bicycle access to Block 4 Open Spaces. It is essential this pedestrian bridge align with the street's mid-block crossing to reinforce the Precinct's "Green Spine"connector and major east-west viewshed.

The bridge structure should balance contemporary design language with TRCA's requirement for sensitive construction methods. The bridge --as well as terraces, boardwalk and all amenity spaces -- will be privately funded and maintained. The implementation of all these public spaces will be contingent upon the future development of Block 4.

Because of the sensitive a nature of the corridor, this Riparian Buffer should be limited to low impact interventions. Low level lighting (instead of poles) should be subtly integrated to minimize light spill in to the corridor. Decking, bridges, and elevated boardwalks are preferred for their light footprint on the forest floor. Sensitive understory habitat and ground nesting birds are better positioned to thrive once separated from trampling or off-leash pets. This open space (more so than any other in the precinct) should feature exclusively native species.

As a hybrid landscape, the Riparian Buffer should also consider means of treating some (or all) of Block 4 stormwater runoff. Bio-retention pockets might clean water before recharging soils and create habitat that has direct synergistic relationship to ecologies of the stream. The interpretive 'boardwalk experience' may be further enhanced by this broader stormwater narrative of ephemeral wetlands and groundwater recharge.

Riparian Buffer
Interpretive Node View

Boardwalk overlooking stream.

Stormwater Ponds
Pond Character



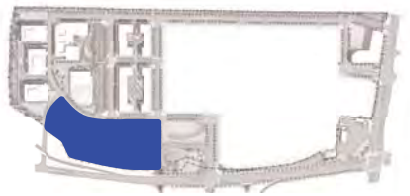








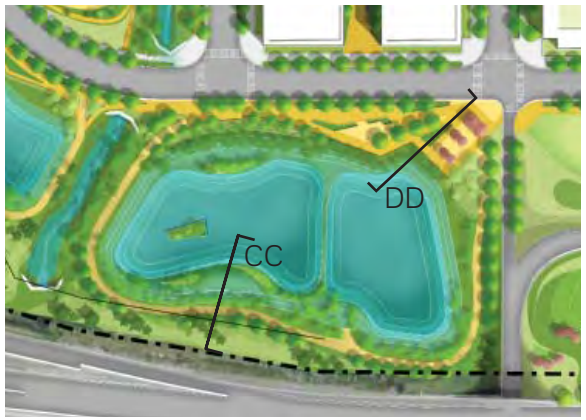


Stormwater Ponds KeyPlan

Stormwater Ponds
Pond Sections

Section CC



Section KeyPlan

The stormwater pond typology is a truly hybrid landscape which integrates storm water management infrastructure with community amenity space as well as shoreline and aquatic habitat.

Side-slopes are graded to maximize extent of aquatic shallows and moist shore-fringe perimeter. Strategic variations in the pond's fine-grading creates small islands, outcrops and in bays that might support diverse range of microhabitat. These strategy serves to enhance both functionality and aesthetics of the pond environment.

The fore bay (treating most turgid, or silt-laden waters) is characterized by tougher stands of cattails, whereas the main ponds cells support a diverse range of aquatic life, including soft rushes, sedges and iris

Floating wetland mats are an important design feature to be incorporated at each stormwater pond. Each of these floating mats bio-mimic natural floating islands to create a "concentrated" wetland effect.

These highly efficient plantings are capable of removing suspended solids and dissolved

Stormwater Ponds
Pond Sections

Section DD

organic carbon, while creating habitat for a variety of aquatic, bird, and beneficial microbial species.

Pond programming and design follows a gradient of urbanity- with the northern edge developed as a hard promenade, while the south edges is more naturalized, with soft gravel paths, reclaimed wood seating, and viewing outlooks with loose stands of sedges and rushes along the pond edge.

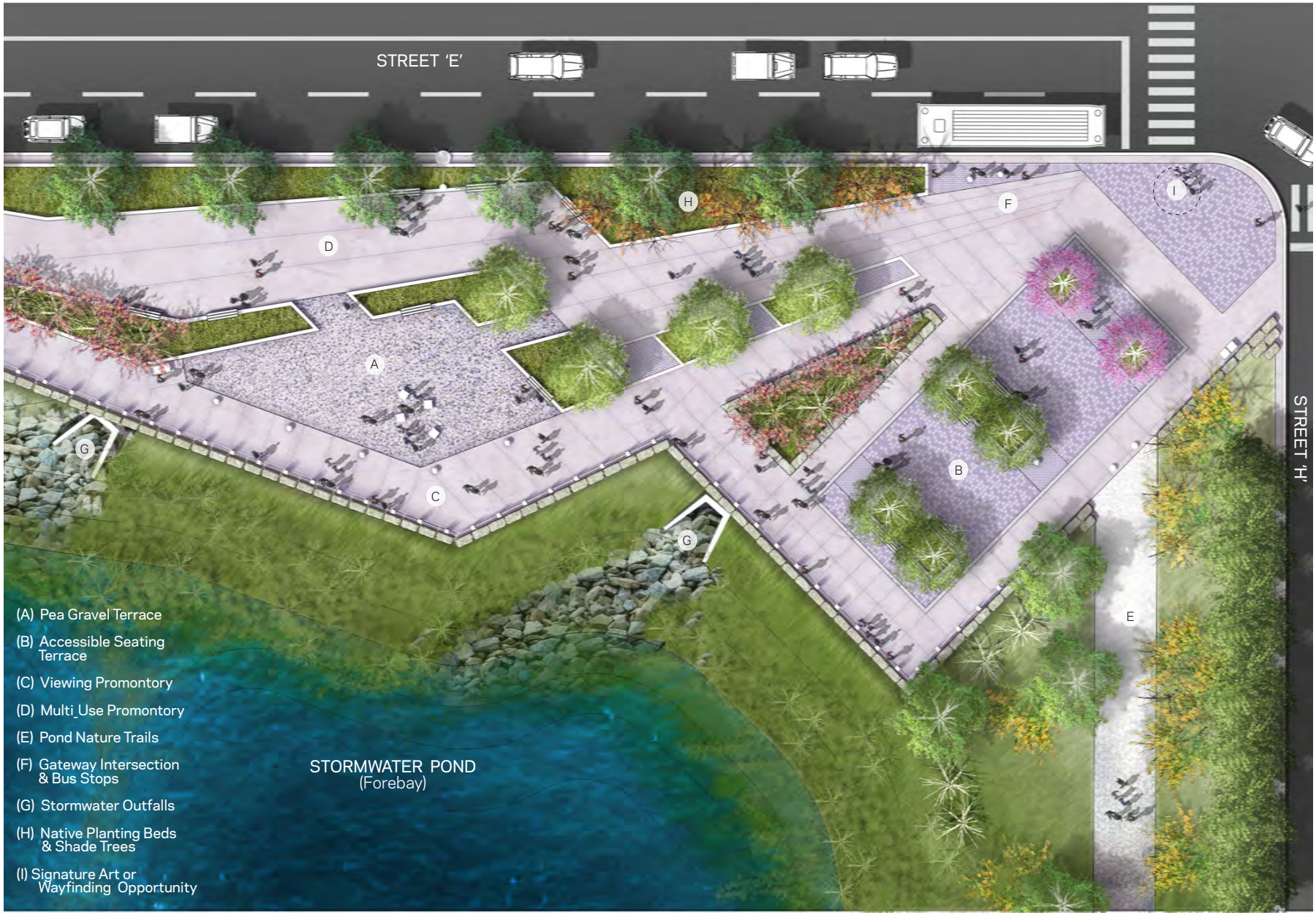
The north side of the stormwater ponds are characterized by a paved promenade with overlook areas. As a major focal point and gathering space, the overlook is a multi-functional gathering space-- flexible enough to support a variety of uses.

The pond overlook and path structure must accommodate bike and pedestrian traffic as well service vehicles. The confluence of fast moving circulation, public congregation, service truck routing, as well as outfall headwalls and other storm water infrastructure demands that the overlook design is highly choreographed.

Circulation here is split into a southern "viewing promenade" for visitors to linger and rest against the broad leaning rail. The broader boulevard-side may be considered the "multi-use promenade" –with more direct circulation and connections to cycle paths and streetscapes.

Level concrete and paved surfaces are easy to navigate for mobility impaired. Trees and planting beds breakup prevailing wind, provide shade and seasonal interest while framing spectacular views across the pond. The overlooks make use of oversized benches, all of which are oriented towards the sweeping southern exposure and fantastical views of Wonderland's towering rollercoasters. The confluence of water + nature within this sublime context reinforces a distinct experience of place and scale.

Stormwater Ponds
Pond Overlook Plan



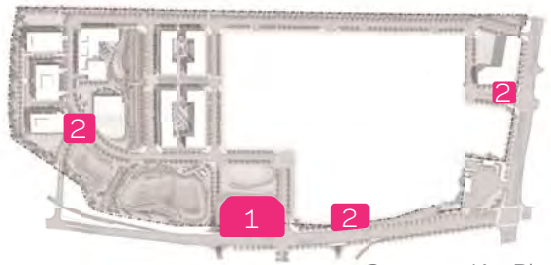
Precinct Gateways
Landform Character







The Goal of the gateway typology is to reinforce the identity of the precinct by celebrating major arrival points into the precinct. The plan identifies several major gateways, each of which has a unique character, scale, and functional response to the entrance condition: (1) Major MacKenzie Precinct Entrance (2) Gateway Intersections



Gateway KeyPlan

Precinct Gateways

Major Mackenzie Gateway

The Major Mackenzie Gateway design is a generous pedestrian streetscape combined with a sculptural terraced landform. This monumental earthwork is sited within an infrastructure block bound by traffic with no public access. It functions as is a sculptural landscape piece to create an immediate strong visual impact and improve the pedestrian experience.

The wild grasses of this tiered gabion landscape echoes the unique planted character found throughout the precinct. Seasonality moves between virgin snow sculpture in the winter, platform for spring flowering, and hardy wind-swept grasses throughout the summer months. **The landform functions on multiple levels:**

Buffering

The topography of the landform helps to mitigate some of the noise and fumes of generated by Major MacKenzie traffic. This is especially important to the flexibility of the small event lawn directly the north. The earthwork will provide a pleasing backdrop for this temporary space, while allowing for seasonal performance or musical program.

Wind Break

The relatively flat open land area of the precinct is subject to significant wind force. Although diminutive in size compared to future development impacts, the earthwork may help to breakup some prevailing wind patterns (particularly those gusts coming from the south). As an effective microclimatic inclusion, the earthwork creates a more comfortable experience for pedestrians moving to and from the transit hub during bracing weather.

Wayfinding

Situated at the hub of a broad transportation network, the landform functions as an important wayfind-ing device for the both the Precinct, and wider Region. An exceptional moment across an otherwise ge-neric transportation landscape, the landform functions as an intuitive wayfinding element.

Precinct visitors might easily identify this major turnoff which otherwise might look quite similar to oth-ers. The concept of gateway may be easily understood-- bridging language and culture, it plays an important role in giving the precinct an identity and engaging a broad population of commuters

Identity

The primary purpose of the landform is to provide strong landscape identity for this wellness-oriented community. As a gateway sculpture, the landform has a strong visual impact both entering and leaving the precinct. It reinforces the Precinct's commitment to sustainability, innovation, art and beauty.

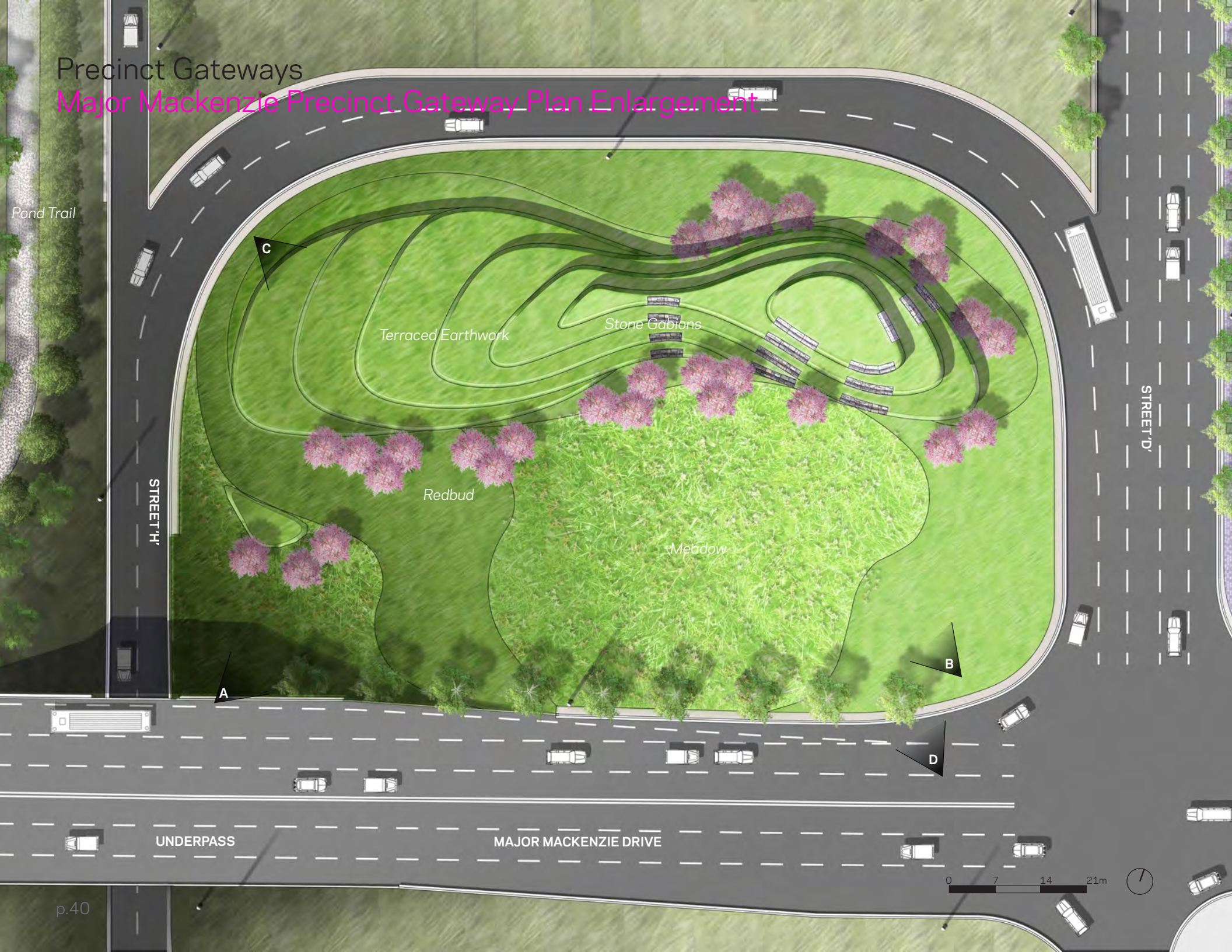
Maintained correctly, this dynamic landscape has capacity to support much richer ecologies and habitat niche than those typical grass banks left sterilized by transportation infrastructure. The earthworks and gabions have been coordinated to maximize design articulation without impacting sightline or traffic safety for this important vehicular hub.

Refer to VHCP Maintenance Manual for additional information on the operations and preservation of this unique feature.

Landform Section

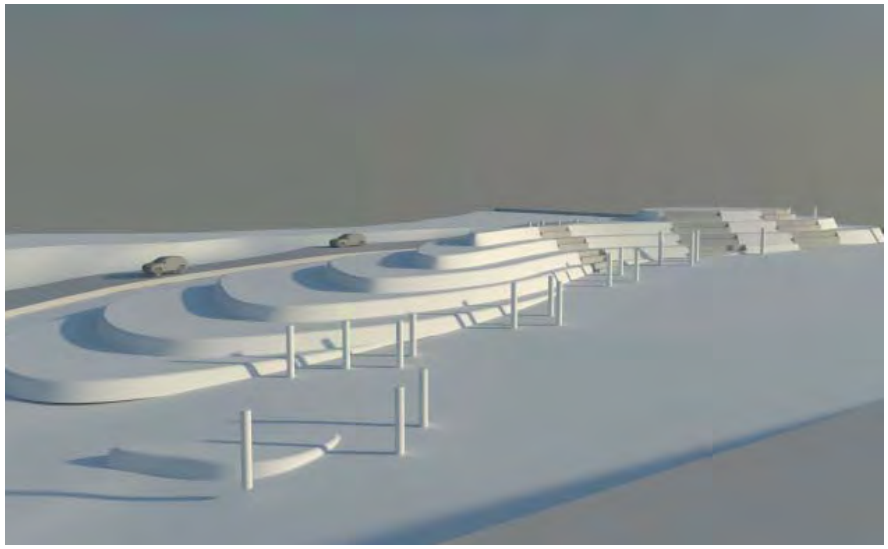
Precinct Gateways

Major Mackenzie Precinct Gateway Plan Enlargement

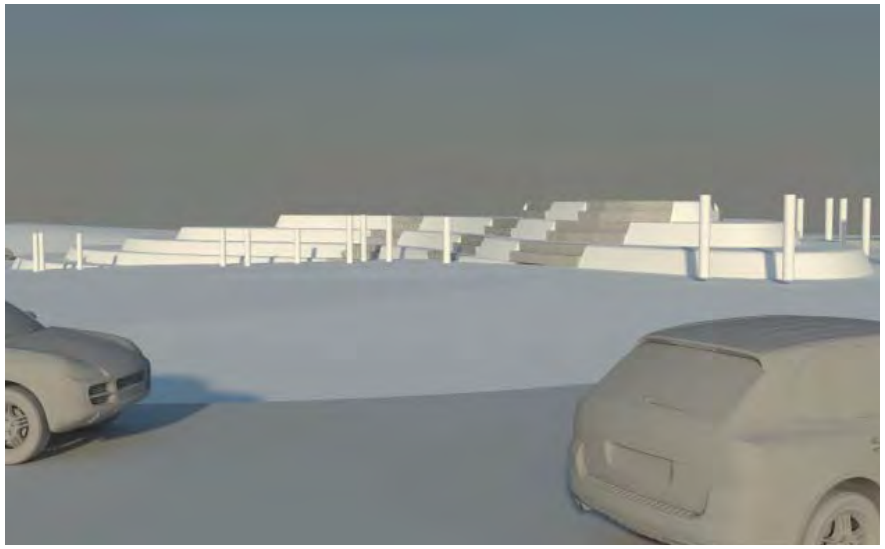


Precinct Gateways

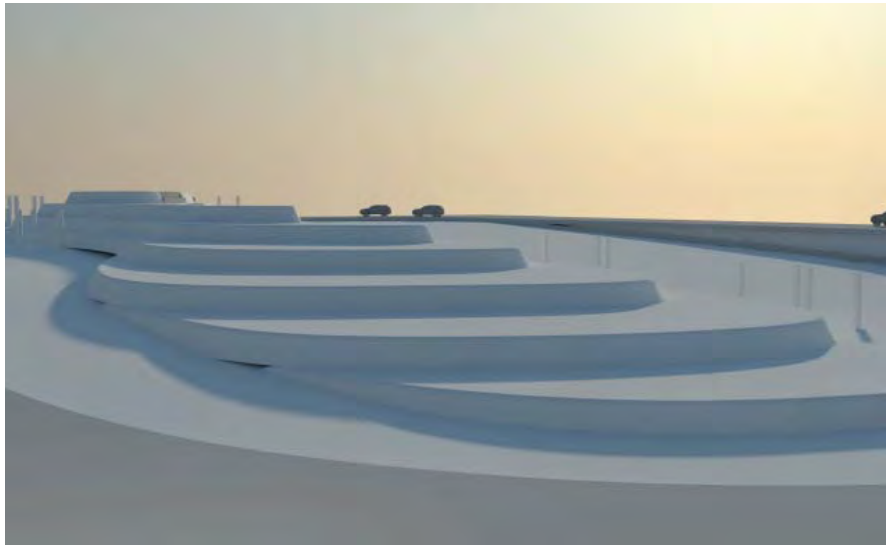
Major Mackenzie Gateway View Study



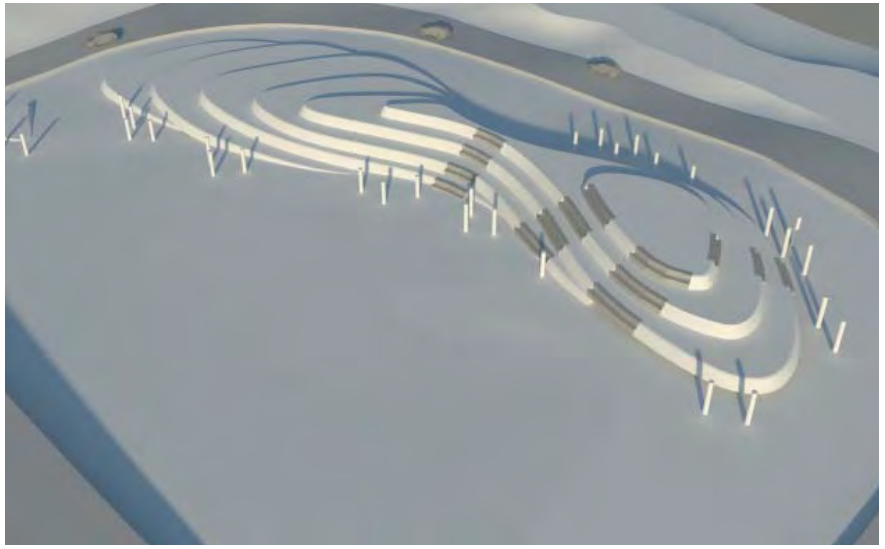
A: Travelling Eastbound from Major Mackenzie



B: Turning onto Street D



C: Street H at Underpass



D: Birdseye View

Precinct Gateways
Major Mackenzie Gateway Rendering

View of Precinct Gateway Landform facing towards Major Mackenzie Drive

Precinct Gateways
Gateway Intersections






Gateway Art Precedents

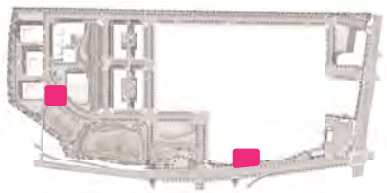
Highway & Hospital Entrances

Two additional Gateways have been identified as opportunities for public art the precinct. While these gateways may take on any number different formats, they should emphasis a sense of entry and reinforce principles of place-making.

Interventions which integrate feature boulevard plantings, street lighting, signage, or environmental conditions (wind, light, sounds, etc.) are encouraged. Gateway Art should be grounded and seamlessly incorporated into both the VHCP Streetscape and Open Space themes and frameworks.

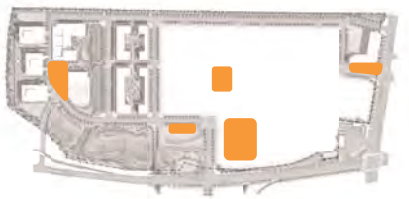
The Region of York has expressed a preference for different symmetrical gateways which reinforce a sense of entry into the precinct. There is a strong prefernce for incorporating public art features in the public right-of-way. Refer to the VHCP Streetscape Concept Doucument for further details.

Consult the City Wide Public Art Program (winter 2016) for more information regarding public art in Vaughan.



Highway & Hospital Entrance Key Plan

Precinct Piazzas
Piazza Design Precedents



Piazzas Key Plan

Precinct Piazzas (POPS)

Piazza Introduction

The piazza may be defined as an accessible mostly hardscaped public space restricting vehicular access, surrounded by urban conditions of streets and buildings that define its' parameters, hosting a variety of functions and activities that engage all aspects of public life. Trees are strategically placed to offer maximum shade with minimal interruption of activities.

It is important to consider the Piazza as a punctuation along the public realm. This is a transitional zone and announce a significant pause in the journey through the public realm.

People will be accessing and passing through in a variety of modes beyond the defined pedestrian, cycle and vehicular mode.

Pedestrian mode can further be broken down to include a variation of passive recreational movement that includes 4 season activity such as: joggers, roller-bladers and roller skiers, baby prams, the elderly and mobility impaired with motorized mobility devices and families with young children. These are inclusive areas and must consider people from all walks of life and mobility requirements.

DEFINITIONS:

Drop Off Piazza

Considered a flow through public space the Drop Off Piazza is a landmark used for pedestrians, motorists and cyclists in which to meet or enter the Healthcare Precinct. Considered more as an island, the space will have ample visual access with seating and protection from the elements for people awaiting a ride and be efficiently signed with a signage and wayfinding strategy that relates to the entire precinct. This space caters to accessibility and convenience and may offer some perimeter convenience retail, service or food and beverage that may take advantage of outdoor seating into the piazza. Other useful features such as a time piece, temperature reading and weather condition updates may be included.

Main Hospital Piazza

The Hospital Piazza is the main public outdoor face for the Hospital that is public by nature and acts a transitional zone for the hospital building. This is a multi-purpose, flexible space that can host hundreds of people on an accessible hardscaped surface that is edged with ample seating and may utilize topographical difference to add additional amphitheatre style seating. Planting is kept near the perimeter of the main activity zone and provide shade to edge seating. Additional durable shade structures will be required to provide at least 80% protection from direct sun. Overall shade protection (Trees and shade Structures) of the Main Hospital Piazza should achieve 40% coverage after 15 years of growth.

Gateway Piazza

The Jane Street Gateway Piazza is considered mostly as a ceremonial or landmark public place associated with precinct signage to announce the Healthcare Precinct of Block A and the associated directional wayfinding that will cater to both motorist, cyclists and pedestrians. Enclaves of seating and passive activity will be separated from the heavy vehicular use of Jane Street.

Humber River Hospital Piazza Precedent

Shared Pedestrian / Vehicular Piazza Precedent

Precinct Piazzas

Drop Off Piazza

As shared vehicle / pedestrians spaces, these Piazzas are associated with drop offs or the major entrances of each development block.

Piazza is considered a pedestrian zone restricted to public vehicular use with the exception of operations and service vehicles that are encouraged to access the site during off-hours.

Site elements and furnishings that interface with vehicles must be durable yet aesthetically pleasing.

Bollards and site furnishings must be designed to dissuade cyclist from locking bicycles to elements such as bollards or posts.

A minimum of 20 covered bicycle parking locations shall be provided in every Drop-Off Piazza. To encourage cyclists to contain parking in one zone and be conveniently located next to a cycle thoroughfare and centrally located to activities.

Cyclists are encouraged to use the piazza but shall stay within designated cycle corridors and dismount in areas considered pedestrian.

Pedestrian priority spaces are articulated through specialty paving consistent through the road and walkway areas, flush paving transitions, and integrated safety elements (such as bollards, low level lighting, tactile surfacing or high contrast safety markings).

Apart from universal accessibility and pedestrian priority, these plazas should be designed for human comfort, with careful attention to human-scale and micro-climate (snowdrifts, sunshade, prevailing winds etc).

The piazza experience should be warm and welcoming, understanding that these spaces have a responsibility to minimize anxiety and fear commonly felt by patients and their families.

Special design consideration should be given for drop offs for Clinics, EMS, and other healthcare facilities given to the often complex interaction between patients, the drivers of patients, and medical service teams.

Entrances should be well-signed, well-lit, clearly navigable, directly accessible, and protected from the elements (via canopy structure or breezeway).

Exterior Shelters must be designed to appear as part of the public realm with architectural integrity and provide a sense of belonging to the Precinct. Shelters shall be completely accessible with seating and provide overhead protection from the elements and have two to three transparent walls that protect from prevailing winter winds.

Proportions of structures in the public realm shall relate to the human scale providing a comfortable environment and transition to the built form of the building envelope.

Planting character should be seasonal, rich and diverse, and provide a calming serene experience.

Paving and planting character shall be inspired by the pre-existing aboriginal and agriculturally uses of the Vaughan region to create a distinct character.

Trees shall be selected based on hardiness, shade potential, limited maintenance requirements (including leaf fall, pollen production, seed and fruit/nut drop). Native and cultural relevant species are preferred.

Softscape should comprise no less than 35% of the piazza space to hardscape and permeable pavements.

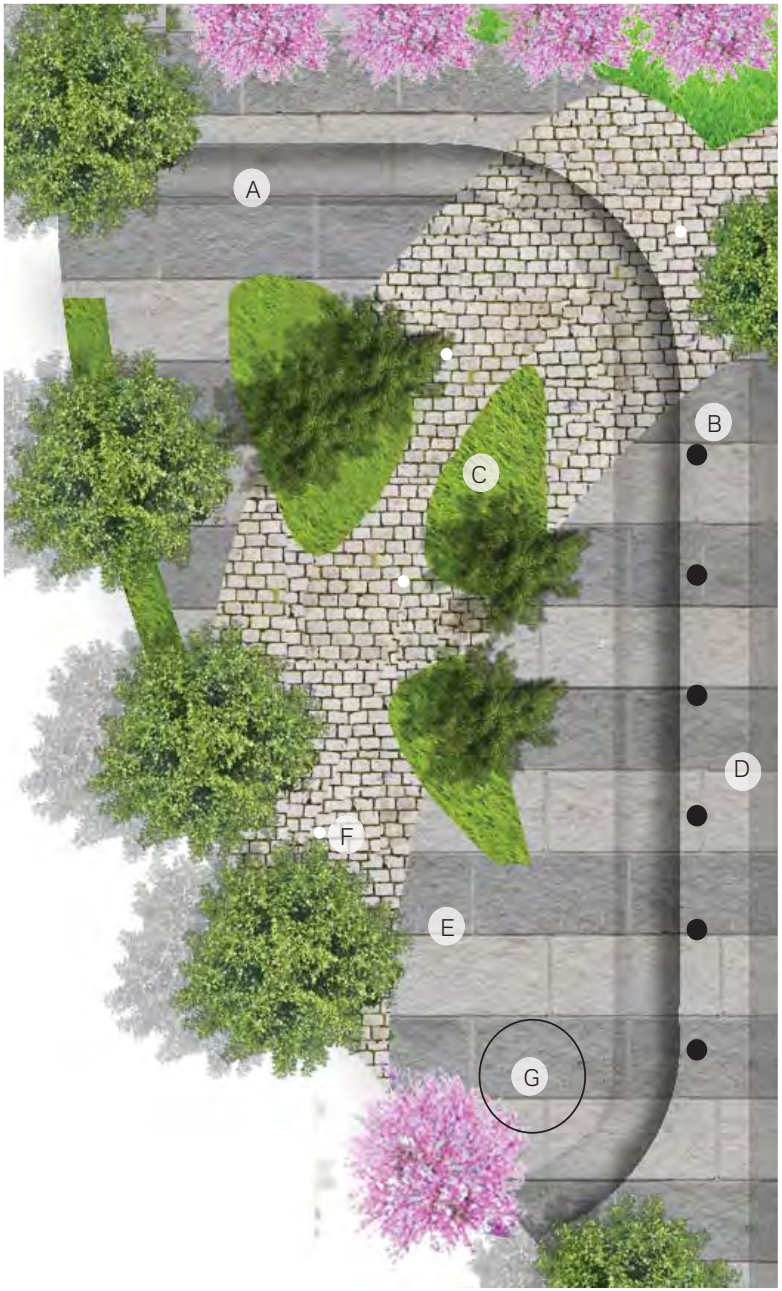
Balance must be conserved between the ratios of permeable and impermeable surfacing. Wherever possible, plaza pavements and plantings should function together as part of each development block's site drainage and storm water strategy.

For example, drainage of impervious paved surfaces may be closely associated with infiltration swales or filtration gardens. Particular attention should be given to collection of runoff from high traffic (or otherwise highly salted) areas of the piazzas. Designs should take into consideration strategies for salting and snow removal along these main paths of travel (ie heat tracing).

Temporary snow storage collection and removal zones may be designated (space permitting) on periphery of piazza boundaries paved in permeable turf block and shall not interfere with year-round accessibility and visual/aesthetic impact. It is intended that these areas act as temporary holding areas and snow be removed within days of storage. Plant species associated or affected by this use shall be tolerant to salt conditions and winter snow loads.

Precinct Piazzas (POPS)

Drop Off Plan Enlargement



(A) Vehicular Circulation

(B) Bollard Edges

(C) Green Native Planting Islands/ Depressed Stormwater Basins

(D) Building Breezeway

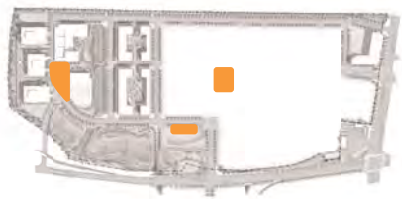
(E) Permeable Vehicular Grade

(F) Wayfinding + Sinage

(G) Gateway Art

Integrated Water-Paving-Planting Systems

Drop off Entrance Canopy



Building Drop Off Key Plan

Precinct Piazzas
Main Hospital Piazza

The Main Hospital Piazza at Block 2 is envisioned as an important community gathering space in the healthcare centre precinct.

For this reason, connectivity, access, amenities and programming should consider the wider community (not only hospital users).

The piazza should be considered a multi-purpose public space capable of accommodating a minimum of 250 people for events such as fund raisers associated with the Hospital and Community.

Whenever possible, the hospital building should consider allocating publically accessible food+ beverage services part its plaza frontage, or alternatively dedicate space for food trucks or vendors.

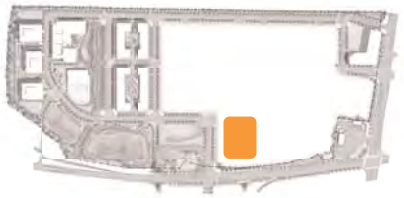
Topographical difference may be used to accommodate additional amphitheatre style seating with shade trees provided at top of slope and edge conditions as to not block views into central piazza.

Planting may be kept near the perimeter of the main activity zone and provide shade to edge seating.

Additional durable shade structures will be required to provide at least 80% protection from direct sun. Overall shade protection (trees and shade structures) of the Main Hospital Piazza should achieve 40% coverage after 15 years of growth.

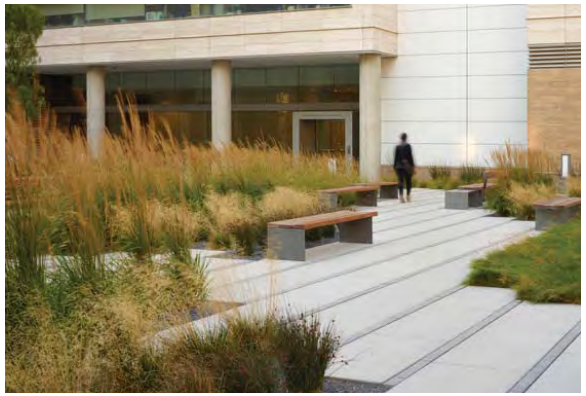
Additional bicycle parking to the Hospital cycle parking requirements shall be required to accommodate community use. A bicycle parking station to accommodate a minimum of 40 bicycles is recommended in close proximity to the piazza and directly adjacent to the bicycle corridor.

Public art is strongly encouraged as a vital element of all piazzas and courtyards in the Healthcare Precinct. A significant public art installation is recommended the Main Hospital Piazza



Main Hospital Piazza Key Plan

Precinct Piazzas (POPS)
Gateways Piazza (Jane Street)



The Jane Street Piazza is closely tied to the building development of Block A. This plaza space should be designed as animated community space with active building frontage.

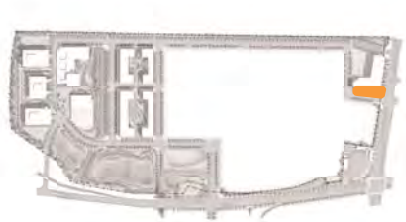
At the same time, design should be scaled appropriately to provide a striking visual marker for vehicular, cycling and pedestrian traffic visiting the hospital. This may include combination of trees, seating coves, gateway planters (see streetscape frameworks), accent lighting, art and / or water features. This civic space should integrate the multiuse bike path and provide ample site amenities to invite public use.

Planting shall be reflective of the overall theming associated with the Drop-Off Piazzas and will be comprised of plant communities that self-sustain requiring minimal maintenance.

The piazza shall have a low planting strip to separate the passive seating area from the vehicular routes while providing visual accessibility into the piazza.

Small differences in elevation are encouraged to differentiate between the road systems and the pedestrian zones. For example, the seating area may sunken or raised within one metre while adhering to the necessary code requirements for accessibility.

Public art installations are encouraged to relate to the overall themeing and natural cultural history of the area.



Gateway Piazza Key Plan

Health & Wellness Spaces
Courtyard Precedents

Health +Wellness Spaces Key Plan

Wellness & Amenity Spaces (POPS)
Wellness Courtyard Plan Enlargement

Courtyard Plan Enlargement

(A) Perennial Beds
(B) Grass Beds
(C) Stormwater Feature
(D) Gravel pockets
(E) Main path
(F) Decked path
(G) Seating

Health + Wellness Spaces, such as courtyards, are outdoor amenity spaces associated with the Precinct's architectural build out.

In keeping with health and wellness open space themes, future development should consider site programming which restores the spirit and sooths the mind.

Healing gardens, therapeutic spaces or meditative courtyards may be complimented by areas for small outdoor performances, music, educational or cultural events.

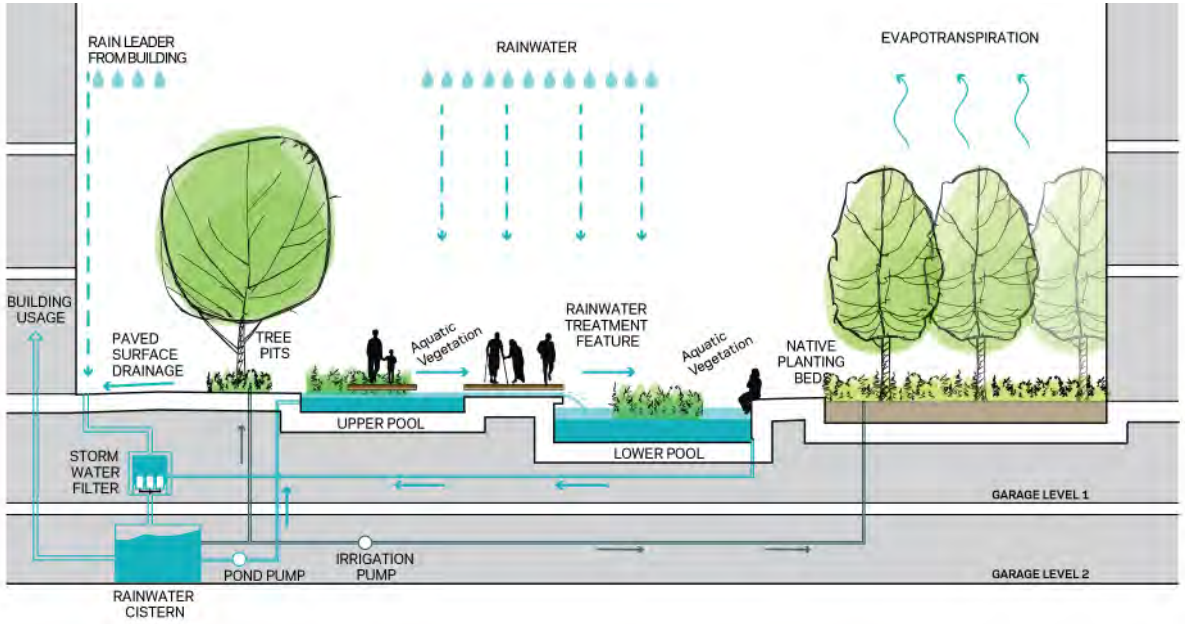
The courtyard typology should provide intimate space for reflection and quiet and should be designed for human comfort (particularly across the shoulder seasons) with ample sunshine, shelter from prevailing winds, and buffering from traffic noise.

Spaces should have ample opportunities for comfortable seating and rest with clear indoor-outdoor connections, safe paving, rich planting, quality maintenance, and round-trip garden pathways where possible. Site lines and accessibility should be strong priorities for these spaces given the aging population of patients and tenants.

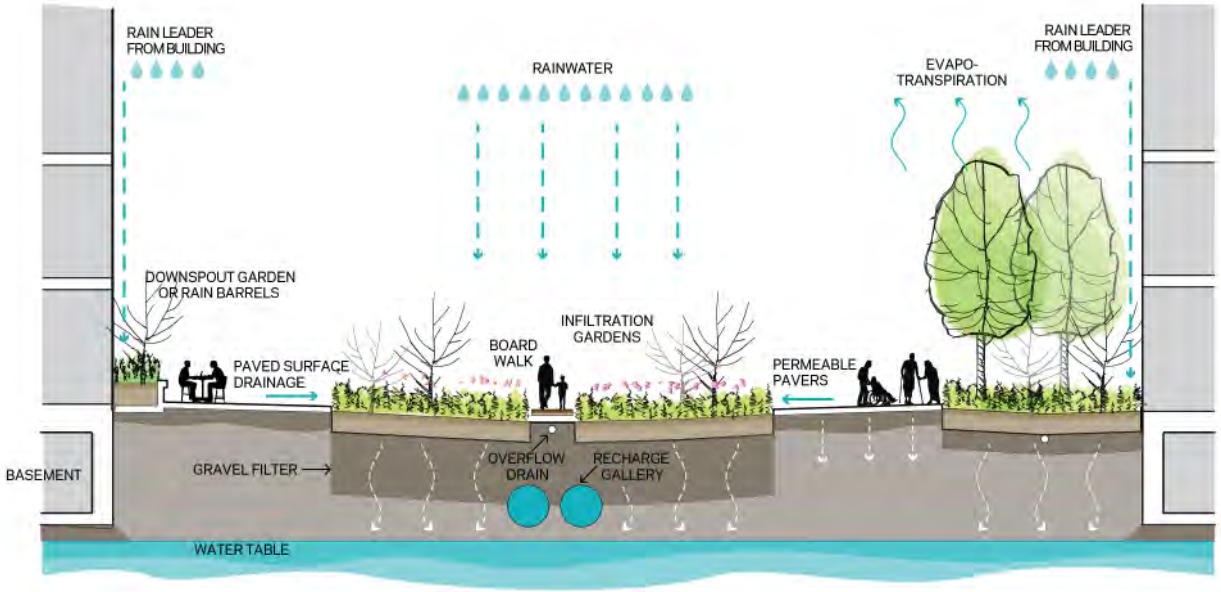
While specific program at individual development blocks should respond to tenant user groups, (extended care facility, clinics, research + development, etc) these spaces are to have a strong public component and clearly welcome members of the wider community to enjoy these spaces.

Health & Wellness Spaces
Stormwater Strategies

Stormwater Feature on Podium Structure



Rain Garden on Grade



Wellness & Amenity Spaces (POPS)
Wellness Courtyard View

Conceptual rendering of a courtyard amenity space


CAT
CAT
CAT

Landscape Implemention

4

Interim Meadow Landscapes

Interim Meadow Landscape Treatment

Interim landscape treatment for future development blocks includes terra- seeding of specific native meadow grasses (Vaughan Healthcare Centre Precinct Meadow Mix, see below). Other native grass seed mixes, particularly those which include butterfly weed (*Asclepias tuberosa*) are also acceptable.

This seed mix provides a broad spectrum of warm and cool season grasses selected for good erosion control and wildlife habitat value. The mix is designed to be a no maintenance seeding, and is appropriate for cut and fill slopes, detention basin side slopes, and disturbed areas adjacent to development projects.

The preferred method of application. Terraseeding is unique in that it protects the seed from the harsh sun, dry winds and local wildlife. This protection improves the chance of germination and overall coverage compared to traditional methods. Refer to project Appendix for complete specification on Terraseeding applications and inspection guidelines

Custom VHCP Meadow Mix:	
Big Blue Stem *(Andropogon Gerardii)*	25%
Little Blue Stem *(Schizachyrum Scoparius)*	25%
Fox Sedge *(Carex Vulpinoided)*	15%
Canadian Wild Rye *(Elymus Canadensis)*	25%
Poverty Oat Grass *(Danthonia Spicata)*	10%

Interim Meadow Landscapes

Big Blue Stem *(Andropogon Gerardii)*
Big Bluestem is considered one of the best native grasses for use as a forage crop. While it is often planted for livestock grazing, it also an excellent year-round shelter for birds and small mammals.
It is often referred to as 'turkey-foot' in reference to the three-pronged seed heads. Deep roots help it survive in times of drought. This also makes it a good grass for erosion control on disturbed sites.

Little Blue Stem *(Schizachyrium Scoparius)*
Little bluestem is frequently found on thin soils situated on knolls and steep slopes as well as on gravelly or sandy soils. This growth habit makes it very valuable in restoration planting.
The flat bluish-green leaves mature into an attractive deep red-brown color at the end of the growing season. The delicate fluffy white seeds are eaten by songbirds and gamebirds. This species is also an important larval host for many butterflies and creates excellent habitat for ground and game birds.

Canadian Wild Rye *(Elymus Canadensis)*
This fast-growing prairie grass serves as an excellent native nurse crop and weed suppressant for prairie grass and wildflowers seeds. Because it has a short lifespan, Wild rye will not overwhelm, and recede in later years. Sometimes referred to as 'Nodding Wild Rye', the characteristic arching seed heads can reach up to 25 centimetres in length. The young Seed may be cooked and ground into a flour for bread.

Fox Sedge *(Carex Vulpinoidea)*
This sturdy, sheath leave sedge has small prickly seed heads that turn gold and brown when mature. The grass is named for its fine-textured bristly fruiting heads which look like a fox's tail. It will be a good colonizer for the disturbed, moist ground associated with the site's low points and drainage ditches.

Poverty Oat Grass *(Danthonia Spicata)*
This Clump-forming bluish-green grass grows easily on poor, dry, rocky soils, for which it owes its common name. As the leaves dry out, they can be become very curly with spikelets having twisted, hairy awns. When a habitat is disturbed (after a wildfire, for example) the seeds long-buried in the soil are stimulated and germinate, making the plant a pioneer species. It then becomes less common as other plant species begin to move in and soil fertility increases.

Public Realm Phasing Plan

Phase A - Public Realm

0 - 2 Year Plan:

Phase A sets the landscape framework for the Precinct.
It includes construction of the following public realm components:

- Neighbourhood Buffer (Block 9),
- Stream Corridor (Block 13)
- Storm Water Pond, Pond Overlook and Promontory (Block7)
- Major Mackenzie Precinct Gateway Landform (Block16)
- Regional & Municipal streets associated with above blocks

As an interim landscape solution, Block 6 is to be transformed into a multi-use turf area and the remaining undeveloped lands will be re-graded and terra-seeded with a customized mix of wild native grasses to create meadow landscapes (Blocks 1, 3, 4, 5, 8).

Public Realm Phasing Plan

Phase B - Public Realm

5-10 Year Plan:

Phase B public realm components includes all streetscapes associated with the MacKenzie Vaughan Hospital construction project.

The Mackenzie Vaughan Hospital outdoor amenity spaces (including the Main Piazza) and circulation network will be designed to enhance and connect with the Precinct's public realm network.

Note that the Main Hospital Piazza should integrate a Major Mackenzie Pedestrian Underpass before (or during) final construction of the Regional Transit Hub

Public Realm Phasing Plan

Phase C - Public Realm

5-20 Year Plan:

As development within the remaining Precinct blocks occurs over time, the associated streetscape frontages will be constructed. Public streets will be connected with a finer grain network of amenity spaces and pedestrian/ cycling connections.

With the development of Block 4, 'the Riparian Buffer Gathering Terraces' and 'Pedestrian Bridge Crossing' should complement the established Stream Corridor (Phase A).

Note the establishment of Pond #1 at Block 9, will be contingent on the storm water strategies employed at the western precinct (i.e. Blocks 4 + 5 storm water requirements may be met using point source treatment)

Open Space Build Out Scenario

Landscape for Demonstration Purposes only.

Build Out Scenario is loosely adapted from +VG Architects and Malone Given Parsons Ltd. The depicted floor spaces and land uses are based on VHC Precinct Plan (2013) recommendations. However, this is not intended to inhibit development of Blocks 3, 4, 5 with other medical related uses.

Appendix

A

TerraSeed Specificaiton

PART 1 - SCOPE

TerraSeeding is the process involving the use of composted topsoil that is injected with seed into a pneumatic blower truck then subsequently blown onto areas designated for the establishment of turf.

PART 2 - MATERIALS

2.1 Seed:

Seed is to be Canada No.1 seed or higher quality

2.2 Seed Mix:

2.2.1 Type 'A' - Custom Meadow Mix:

To be used in all stormpond and valley areas outside 5 year flood line.

Big Blue Stem (Andropogon Gerardii)	25%
Little Blue Stem (Schizachyrum Scoparius)	25%
Fox Sedge (Carex Vulpinoidea)	15%
Canadian Wild Rye (Elymus Canadensis)	25%
Poverty Oat Grass (Danthonia Spicata)	10%

Application seed rate:

200kg / ha

Supplied by:

Ontario Seed Company // tel: 519-886-0557
(or approved equal to be approved by Landscape Architect)

2.2.2 Type 'B' - Custom Wet Meadow Mix:

To be used in all stormpond and valley areas inside 5 year flood line.

Joe Pye Weed (Eupatorium Malculatum)	10%
Canada Bluejoint (Calamagrostis Canadensis)	15%
Fox Sedge (Carex Vulpinoidea)	25%

Soft Rush (Juncus Effusus)	15%
Jointed Rush (Juncus Articulatus)	10%
Porcupine Sedge (Carex Hystericina)	15%
Blue Vervain (Verbena Hastata)	10%

Application seed rate:

200kg / ha

Supplied by:

Ontario Seed Company // tel: 519-886-0557
(or approved equal to be approved by Landscape Architect)

2.3 Annual Nurse Crop Seed

Nurse crop seed shall be a cereal grain such as Fall Rye Grain or Winter Wheat Grain unless otherwise approved by the Contract Administrator.

2.4 Fertilizer

Fertilizer shall comply with the provisions of the Canada Fertilizers Act and Fertilizer Regulations. Fertilizer shall be supplied in original bags bearing the manufacturer's original label indicating mass and analysis. All fertilizer shall be in granular form, dry, free flowing and free from lumps and with an analysis as specified in Table 1 (Page 6).

2.5 Composted Topsoil

Composted topsoil shall be pre-mixed and shall consist of a minimum 60% compost material. The composted topsoil may be amended by the addition of concrete sand and peat loam. Concrete sand shall be added to improve aeration and soil structure. Peat loam shall be added to adjust the pH of the compost and to make the composted topsoil lighter and easier to blow. Both amendments shall be added at the discretion of the Contractor to ensure that the composted topsoil meets the material specification and is suited for distribution by a pneumatic blower.

Once mixed, composted topsoil material shall consist of particles where 100% of the material is able to pass through a 25 mm sieve.

2.6 Compost

Compost shall be derived from well-composted green organic waste matter. All compost material shall meet the Ontario Ministry of the Environment's Interim Guidelines for the Production and Use of Aerobic Compost in Ontario definition for Type A compost and shall be supplied from composting sites certified to meet the Ontario Ministry of the Environment's Compost Regulation 101.

2.7 Concrete Sand

Concrete sand shall have a pH range from 7.7 to 8.0 with a mid-range of 7.8 and shall meet gradation requirements for concrete sand as described in OPSS.

2.8 Peat Loam

Peat loam shall consist of a minimum 50% organic matter and equal parts sand, silt and clay. Peat loam shall be suitable for horticultural purposes. Shredded particles shall not exceed 16 mm in size.

2.9 Water

Water shall be free of any contaminants or impurities that would adversely affect the germination and growth of vegetation.

PART 3 - EQUIPMENT

3.1 Pneumatic Blower Truck

The pneumatic blower truck shall be a custom manufactured, fully integrated, truck-mounted unit. The blower truck shall be equipped with a computer-calibrated seed injection system and shall be capable of uniformly applying composted topsoil and seed at a rate greater than 0.25 cubic meters of material per minute. The blower truck shall also be equipped with an application hose capable of extended 90 meters from the blower truck unit.

PART 4 - CONSTRUCTION

4.1 Operational Constraints

The composted topsoil and seeding operation shall not commence until a legible, valid Seed Analysis Certificate and a legible, valid signed declaration from the compost supplier have been provided to the Contract Administrator.

The composted topsoil and seeding operation shall not commence until the Contract Administrator has approved the surface preparation and the layout of permanent seed mixes.

The composted topsoil and seeding application and/or re-application shall not be carried out under adverse field conditions such as high wind, frozen soil or soil covered with snow, ice or in areas of standing water or a concentrated flow of water.

The Contractor shall maintain the site and control erosion until conditions permit application or re-application of seed and composted topsoil.

The surface to be seeded shall be prepared not more than 7 calendar days before the seeding operation.
No seeding or composted topsoil application shall come in contact with the foliage of any trees, shrubs, or other vegetation. No seed or composted topsoil application shall come in contact with waterbodies.

4.2 Surface Preparation for Composted Topsoil and Seeding

At the time of seeding, all surface areas designated for seeding shall be free of erosion and shall have a fine graded uniform surface. The surface shall be uniformly cultivated with agricultural implements to a minimum depth of 50 mm and shall not have surface stones greater than 50 mm in diameter, weeds or other unwanted vegetation.

Soil to be loose, friable and suitable as a seed bed to germinate seed.

4.3 Layout

The location of the seed mix and composted topsoil shall be staked out on the ground surface in accordance with the contract drawings. Stakes shall be used to indicate the limits of the seed mix.

4.4 Composted Topsoil and Seeding

4.4.1 Application Rates for Composted Topsoil

Depending on slope gradation, depth of composted soil, seed shall be as follows:

TerraSeed Specification

0-5% slope: 10-15 mm. depth
5-10% slope: 15-20 mm. Depth
10-25% slope: (4:1) 20-25 mm. depth
25-35% slope: (3:1) 25-40 mm. depth
35-45% slope: 40-50 mm. depth

4.4.2 Composted Topsoil and Seed Application

Prior to the application of the composted topsoil and seeding, the Contractor shall ensure that the pneumatic blower has been properly calibrated to provide the specified amounts of seed and that the blower can adequately uniformly apply composted topsoil and seed at a rate greater than o.25 cubic meters of material per minute.

Once the blower has been calibrated, the Contractor shall apply composted topsoil and seeding uniformly at specified depths to all areas identified for cover in the contract drawings or as directed by the Contract Administrator.

Composted topsoil and seed shall overlap the adjoining ground cover by 300 mm.

4.4.3 Clean-up

At the completion of the seeding and cover operation, materials applied to areas or objects other than those designated to grow grass shall be removed. Clean water shall be used to immediately wash seed or cover materials that have been applied to the foliage of trees, shrubs or other susceptible plant growth.

PART 5 - QUALITY ASSURANCE

5.1 Performance Measure

All composted topsoil and seeded areas will be inspected by the Contract Administrator to ensure compliance with this specification at thirty, sixty and ninety day periods following the composted topsoil and seeding operation.

At the thirty day inspection within the seeded earth area;

- the composted topsoil shall be visually intact and shall form a uniform cohesive mat;
- germination of the nurse crop shall be visually evident.

At the sixty day inspection within the seeded earth area;
- the nurse crop shall be evident at mature height in an evenly dispersed, uniform cover;
- germination of the specified, permanent seed species shall be visually evident in an evenly dispersed uniform cover;
- there shall not be any significant bare areas, both in terms of quantity and size;
- non-seeded, non-specified vegetation shall not exceed 20% of the seeded earth area.

At the ninety day inspection within the seeded earth area;
- the permanent seed species shall be at an average height of 50mm in an evenly dispersed, uniform cover; representative of the specified, permanent seed mixes;
- there shall not be any significant bare areas, both in terms of quantity and size;
- non-seeded, non-specified vegetation shall not exceed 20% of the seeded earth area.

No inspections will be held during the winter dormant period or when site conditions prohibit a visual field inspection. The timing intervals between inspections will be suspended during the winter dormant period.

5.2 Failure to Meet Performance Measure

If the completed work does not meet the Performance Measure after the thirty-day inspection, the Contract Administrator shall document the failure areas, notify the Contractor of those areas, and re-inspect at the sixty day inspection.

If the completed work does not meet the Performance Measure after the sixty or ninety day inspection, the Contract Administrator shall notify the Contractor in writing and the Contractor shall re-apply the specified materials in accordance with this specification within 14 calendar days of receiving the notification.

The Contractor shall maintain the site and control erosion until conditions permit application or re-application of and composted topsoil seed.

All replaced composted topsoil and seed shall be subject to the Quality Assurance section of this specification.

5.3 Measurement and Payment Procedures

Measurement: Measurement shall be based on a lump sum basis.

Payment: Payment shall be based on the lump sum price in the tender. The tendered price shall constitute full compensation for furnishing and preparation of all materials and equipment as required to complete the work as specified in the Contract Drawings. In addition, the price is to include the cost of all labour as required to complete the above-noted work.

END OF SECTION

The Tree Specialists Inc.
Providing professional tree care & consulting services

Tel: (905)469-1717
Fax: (905)469-9614
cgavin@thetreespecialists.com
586 Third Line, Unit F
Oakville, ON L6L 4A7

September 10, 2014

The HOK Planning Group
720 King Street West, Suite 505
Toronto, ON M5V 2T3

ATTENTION: Ms. Shannon Day-Lee

Shannon.Day-Lee@hok.com
t. 416-342-7034

RE: Vaughan Healthcare Precinct - Vaughan
Tree Inventory

I have been retained by Ms. Shannon Day-Lee, of *The HOK Planning Group*, to inventory all regulated trees located on and within 6.0m of the subject site. The following is the tree inventory as per my site visit dated September 10, 2014. See attached Tree Inventory in Appendix I for corresponding tree locations.

TREE INVENTORY DATA
Vaughan Healthcare Precinct – Vaughan, On

Tree #	Species	DBH (CM)	Condition[1]	Category[2]
169	*Ulmus americana*	72	F	1
170	*Ulmus americana (3)*	20-28	D	1
171	*Quercus macrocarpa*	8	F	4
172	*Gleditsia triacanthos*	6	F	4
173	*Quercus macrocarpa*	11	G	4
174	*Quercus macrocarpa*	11	F	4

[1] **Condition:** A rating of **H**azardous/**D**ead/**P**oor/**F**air/**G**ood/**E**xcellent was determined for each tree by visually assessing all the above ground components of the tree, using acceptable arboricultural procedures as recommended in the *"Guide for Plant Appraisal"*, prepared under contract by the *"Council of Tree & Landscape Appraisers (CTLA)*, an official publication of the *International Society of Arboriculture (I.S.A.), 9th Edition, 2000"*.

[2] **Category #:** 0. Tree NOT regulated under City of Vaughan Tree by-laws.
1. Trees with diameters of 20 cm or more, situated on private property on the subject site.
2. Trees with diameters of 20 cm or more, situated on private property, within 6 m of the subject site.
3. Trees of all diameters situated on City owned parkland within 6 m of the subject site.
4. Trees of all diameters situated within the City road allowance adjacent to the subject site.

Tree #	Species	DBH (CM)	Condition	Category
175	*Prunus virginiana*	4	F	4
176	*Quercus macrocarpa*	10	F	4
177	*Gleditsia triacanthos*	4	G	4
178	*Quercus macrocarpa*	11	F	4
179	*Quercus macrocarpa*	9	F	4
180	*Acer platanoides*	3	F	4
181	*Quercus macrocarpa*	9	F	4
182	*Acer platanoides*	3	P	4
183	*Quercus macrocarpa*	8	F	4
184	*Acer platanoides*	4	F	4
185	*Acer platanoides*	4	P	4
186	*Quercus macrocarpa*	9	F	4
187	*Quercus macrocarpa*	8	G	4
188	*Populus spp.*	43	F	1
189	*Quercus macrocarpa*	7	G	4
190	*Quercus macrocarpa*	9	F	4
191	*Quercus macrocarpa*	9	F	4
192	*Quercus macrocarpa*	10	F	4
193	*Juglans nigra*	8	F	4
194	*Picea pungens*	20	P	1
195	*Picea pungens*	21	F	1
196	*Picea pungens*	22	G	1
201	*Pinus nigra*	24	F	1
202	*Pinus nigra*	29	F	1
203	*Pinus nigra*	28	F	1
204	*Pinus nigra*	28	F	1
205	*Pinus nigra*	27	F	1
206	*Pinus nigra*	26	P	1
207	*Pinus nigra*	26	P	1
208	*Pinus nigra*	24	P	1
209	*Pinus nigra*	31	P	1
210	*Pinus nigra*	23	P	1
211	*Pinus nigra*	28	P	1
212	*Pinus nigra*	27	F	1
213	*Pinus nigra*	28	F	1
214	*Pinus nigra*	29	P	1
215	*Acer platanoides*	32	P	1
216	*Acer platanoides*	34	F	1
217	*Acer platanoides*	31	F	1
218	*Acer platanoides*	33	F	1
219	*Acer platanoides*	34	F	1
220	*Acer platanoides*	30	G	1
221	*Pinus nigra*	26	P	1

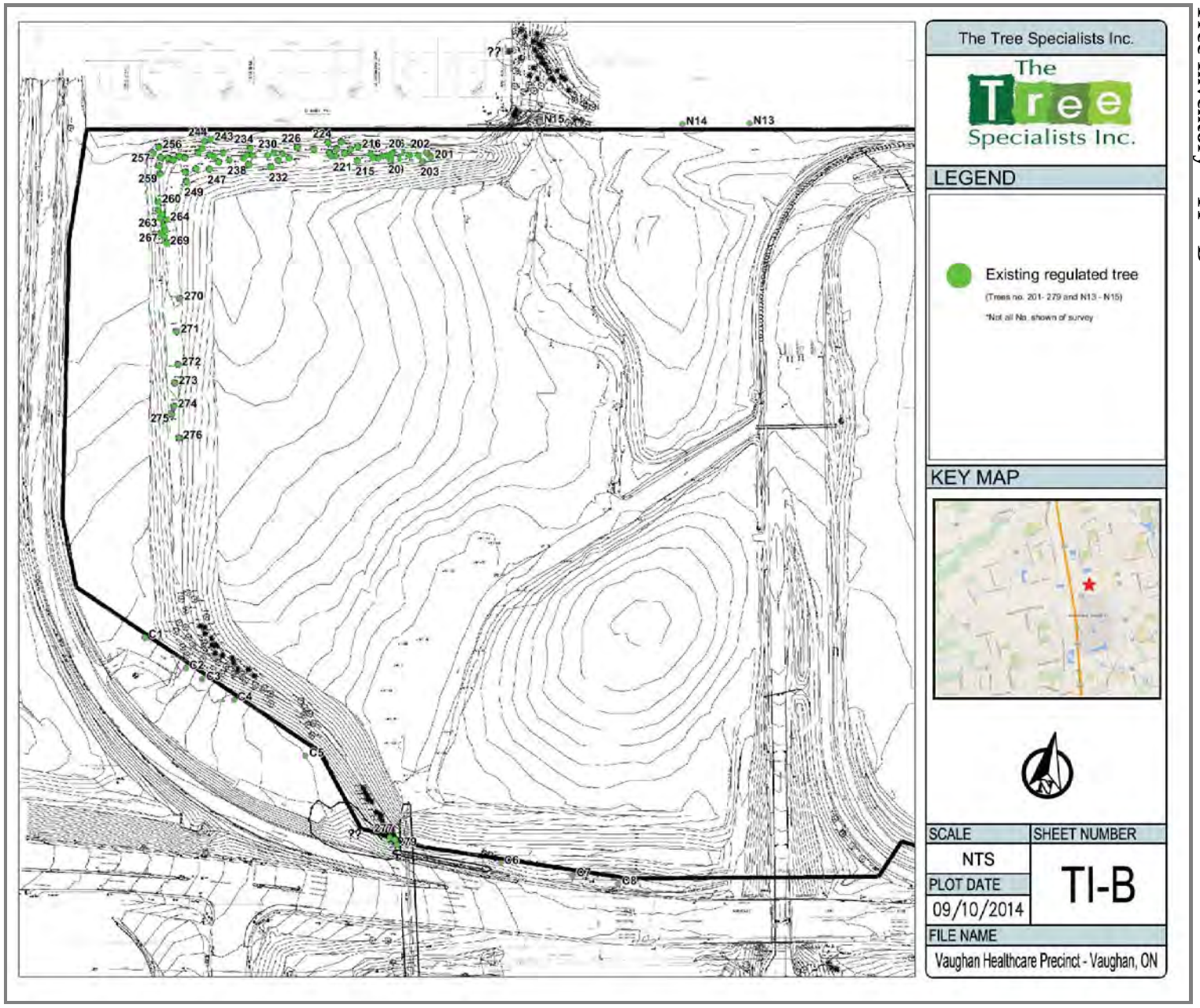
Tree Survey

Tree #	Species	DBH (CM)	Condition	Category
222	*Pinus nigra*	26	P	1
223	*Acer platanoides*	29	F	1
224	*Acer platanoides*	34	F	1
225	*Acer platanoides*	39	G	1
226	*Acer platanoides*	38	F	1
227	*Pinus nigra*	25	P	1
228	*Pinus nigra*	26	P	1
229	*Acer platanoides*	31	F	1
230	*Pinus nigra*	28	F	1
231	*Pinus nigra*	26	P	1
232	*Acer platanoides*	27	P	1
233	*Pinus nigra*	28	F	1
234	*Pinus nigra*	34	P	1
235	*Pinus nigra*	24	P	1
236	*Pinus nigra*	30	F	1
237	*Acer platanoides*	33	G	1
238	*Pinus nigra*	30	P	1
239	*Pinus nigra*	28	P	1
240	*Acer platanoides*	31	F	1
241	*Pinus nigra*	28	F	1
242	*Pinus nigra*	30	F	1
243	*Pinus nigra*	24	P	1
244	*Pinus nigra*	34	F	1
245	*Pinus nigra*	27	P	1
246	*Pinus nigra*	26	P	1
247	*Acer platanoides*	35	P	1
248	*Acer platanoides*	33	F	1
249	*Acer platanoides*	34	F	1
250	*Acer platanoides*	28	F	1
251	*Acer platanoides*	31	F	1
252	*Acer platanoides*	30	P	1
253	*Acer platanoides*	26	P	1
254	*Acer platanoides*	29	F	1
255	*Acer platanoides*	27	F	1
256	*Acer platanoides*	33	F	1
257	*Acer platanoides*	31	F	1
258	*Acer platanoides*	35	F	1
259	*Acer platanoides*	34	F	1
260	*Pinus nigra*	33	F	1
261	*Pinus nigra*	32	F	1
262	*Pinus nigra*	28	F	1
263	*Pinus nigra*	29	P	1
264	*Pinus nigra*	29	P	1
265	*Pinus nigra*	31	P	1

Tree #	Species	DBH (CM)	Condition	Category
266	*Pinus nigra*	28	F	1
267	*Pinus nigra*	27	F	1
268	*Pinus nigra*	26	P	1
269	*Pinus nigra*	29	D	1
270	*Acer platanoides*	31	P	1
271	*Acer platanoides*	32	F	1
272	*Acer platanoides*	33	F	1
273	*Acer platanoides*	30	F	1
274	*Acer platanoides*	32	F	1
275	*Acer platanoides*	28	P	1
276	*Acer platanoides*	30	F	1
277	*Pinus nigra*	30	F	4
278	*Pinus nigra*	29	F	4
279	*Pinus nigra*	30	F	4
C1	*Eleagnus angustifolla*	16	F	4
C2	*Eleagnus angustifolla*	10	F	4
C3	*Eleagnus angustifolla*	12	F	4
C4	*Eleagnus angustifolla*	17	F	4
C5	*Ulmus americana*	11	F	4
C6	*Eleagnus angustifolla*	8	F	4
C7	*Eleagnus angustifolla*	6	F	4
C8	*Eleagnus angustifolla (19)*	9-17	F	4
N1	*Fraxinus americana*	24	P	2
N2	*Fraxinus americana*	25	F	2
N3	*Fraxinus americana*	23	F	2
N4	*Picea pungens*	22	F	2
N5	*Picea pungens*	21	F	2
N6	*Picea pungens*	20	F	2
N7	*Picea pungens*	21	F	2
N8	*Fraxinus americana*	23	F	2
N9	*Fraxinus americana*	22	F	2
N10	*Fraxinus americana*	23	F	2
N11	*Gleditsia triacanthos*	22	F	2
N12	*Gleditsia triacanthos*	20	F	2
N13	*Juglans nigra*	20	F	2
N14	*Populus spp.*	28	F	2
N15	*Salix alba*	21	F	2

Tree Survey

Tree Inventory – TI – B



Tree Survey

Appendix I: Tree Inventory – TI – A

Appendix III:

Digital Images

Figure 1. Trees no. 201-232 looking northeast.

Figure 2. Trees no. 247-269 looking northwest.

Figure 3. Trees no. 270-276 looking south.

Figure 4. Trees no. 277-279 and C6-C8 looking west.