



Ottawa Community Housing

Mikinak Redevelopment

Site Plan Control Application | Design Brief

May 19th 2021



Preface

“I don’t think that architecture is only about shelter, is only about a very simple enclosure. It should be able to excite you, to calm you, to make you think.”

– Zaha Hadid

The Mikinak Redevelopment is one part of the comprehensive 10-Year Development Plan established by Ottawa Community Housing Corporation in 2019. The subject land is Block 21 of Wateridge Village, former site of Canadian Forces Base (CFB) Rockcliffe, for the development of 271 affordable housing units, distributed across three buildings: Building A is sited at the northern boundary; Building B is sited along the western boundary; and Building C is sited along the southern boundary. Sustainability, Passive House, Net Zero, WELL, CPTED, AODA and CMHC Standards are incorporated into the successful design with an emphasis on the integrity and durability of materials/systems and life-cycle costing benefits.

The challenges of the project are manifold: finding the balance between regulatory accommodation, project objectives, performance requirements and the beauty of an architectural expression to create a unique, yet harmonized pedestrian-oriented community. Each challenge was converted into an opportunity for intelligent creativity. Regulations set the framework within which the team constrained the design. The project objectives and stringent performance requirements defined the parameters of siting, massing and functional programming into measurable goals for the development as a whole and within each building. The architectural expression flowed from the principles of dignity, identity and equality reflected in a series of unique buildings, each in harmony with its urban context yet distinguished with its volume, materiality and use of colour. The interplay between the public realm’s grade-level greenbelt and links to surrounding landscape, both public and private, promote healthy living and well-being. The Mikinak Redevelopment conveys a sense of belonging, family and community with each individual an integral part of the “block” within the urban “quilt” of Wateridge Village.

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Section 1: Framework

Goals & Vision

This Design Brief has been prepared by IBI Group on behalf of Ottawa Community Housing Corporation, for the proposed development at 715 Mikinak Road. The subject property is legally described as Block 21 on registered Plan of Subdivision 4M-1581, within Phase 1B of Wateridge Village. Block 21 is bound by Hemlock Road to the north, Bareille-Snow Street to the west, Mikinak Road to the south, and Michael Stoqua Street to the east. The property has an area of approximately 12,185 square metres (1.2 ha) and frontage of approximately 82 metres on Hemlock Road and Mikinak Road, and approximately 123 metres on Bareille-Snow Street and Michael Stoqua Street. The subject property is currently undeveloped.

The purpose of this Design Brief is to provide a description of how the proposed development meets applicable urban design objectives in relation to a Site Plan Application. The Site Plan application process will review the proposed residential development in the context of Wateridge Village, applicable zoning provisions and ensure that a high level of urban design is advanced.

GOALS

There is insurmountable evidence of the benefits of social affordable housing to our society. Its development intervenes on a human scale providing the impetus for social equity, inclusion, and well-being. The many aspirations of the Ottawa Community Housing Corporation in this regard provide innumerable challenges to the architects. Transforming the challenges into creative opportunities that contribute to the built environment, not only as professionals but as members of society, is a gift. The initial mandate is to break the stigma often associated to social housing by allowing a seamless integration of the newly-built intervention into the neighbourhood. Equally important is the mandate to provide support to those less fortunate, more vulnerable and less likely to benefit from societal inclusion due to differences in ability. Adequate housing has a primary position in our lives and thereby is the pivot used to rise above societal inequalities and injustice. Dignity, identity and equality is sought by each of us through our homes.

Creative Principles to build a series of homes that reflect an equitable, sustainable and unique society:

1. Establish architecture that is responsive to the neighbourhood by means of providing a holistic and continuous approach;

2. Provide multiple safe outdoor amenity spaces for diverse activities and diverse age groups;
3. Clean-lined architecture to benefit from life-cycle costing efficiencies;
4. Simple patterning of windows and materials that are structured yet seem random;
5. Acknowledge the past, yet look to the future;
6. Create a walkable environment to promote health and well-being; and
7. Synthesize the Indoor – Outdoor relationship.

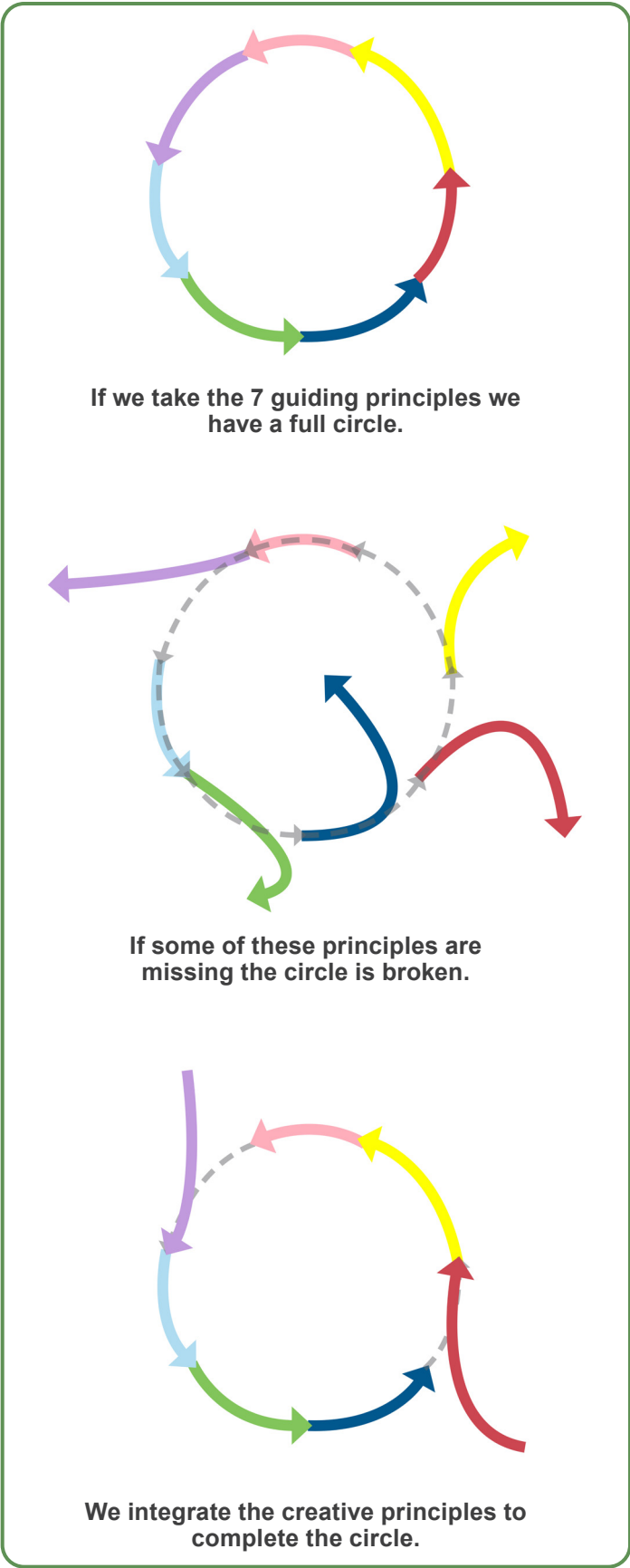
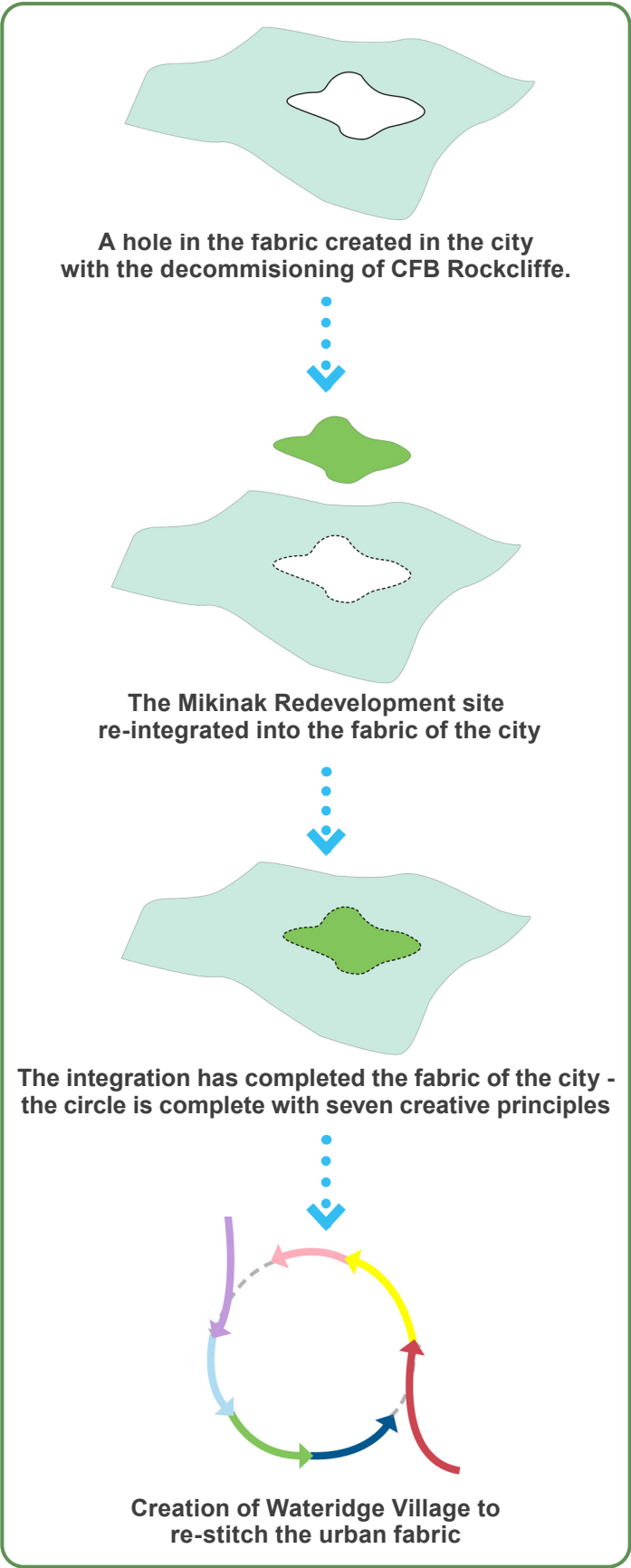
VISION

The site remained a hole in the city after the decommissioning of the army base - a broken circle. The future tenants of the Mikinak Redevelopment may also have a broken circle in their life, working yet unable to afford decent housing and/or in need of a home that will provide them with the respect and humility that each and every one of us deserves. The provision of affordable housing should reflect new ways of living and the growing environmental challenges affecting where and how we live.

The Algonquins have a belief system centred in a full circle of Seven Principles: Bravery, Truth, Humility, Honesty, Respect, Love and Wisdom. These principles can resonate with the qualities that many tenants seek to integrate into their lives. Our opportunity to create an architecture and spaces that exemplify these principles is one we embrace. Through the design of units, common spaces, outdoor amenity spaces and links to surrounding environment, the development design will provide the framework for a healthy and fulfilling life not only for the tenants, but the wider city population.

Just as the former base provided a safe haven for those serving and their families, so too will the project design provide to its tenants: protection, inclusion and equality. By doing so, the tenants will have fair access to opportunities and resources for an economically stable, healthy life, how we collectively treat those that are most vulnerable defines the type of society we are. To reflect an open-minded, inclusive and generous nature, the provision of beautiful, energy-efficient and affordable buildings that respond to community needs is the way forward. It is the guiding vision of Ottawa Community Housing and we embrace it.

We build the circle to break the stigma, integrate into the City and heal the people and the land.



City of Ottawa – Official Plan

CITY OF OTTAWA OFFICIAL PLAN

The subject lands are designated General Urban Area in the City of Ottawa Official Plan. The General Urban Area contemplates the development of a full range and choice of housing types, in combination with employment, retail, service, cultural, leisure, entertainment and institutional uses to facilitate the development of complete and sustainable communities. Throughout the General Urban Area, the City encourages small, locally-oriented convenience and services uses that complement the adjacent residential land uses, and which are of a size and scale consistent with the needs of nearby residential uses.

Under the policies for Building Liveable Communities, the Official Plan speaks to affordable and appropriate housing for all residents being the building block of a healthy and liveable community.

The Official Plan policies contribute to improving the supply of affordable housing in concert with other City initiatives to support the construction of affordable units.

Specifically, the City will investigate means to increase the supply of affordable housing by engaging with the private sector, non-profit and cooperative housing providers in meeting the affordable housing target for low-income and moderate-income households, within the context of the City's Housing Strategy.

The proposed development addresses the applicable policies in Section 3.6.1 – General Urban Area of the Official Plan, as it includes a medium density residential use within a compatible built form of four to seven storeys, ample outdoor amenity area with functional programming for a variety of users, in accordance with the development objectives for the Wateridge Village community context. There are also opportunities for connection to the greater community's greenspace and natural environment network.

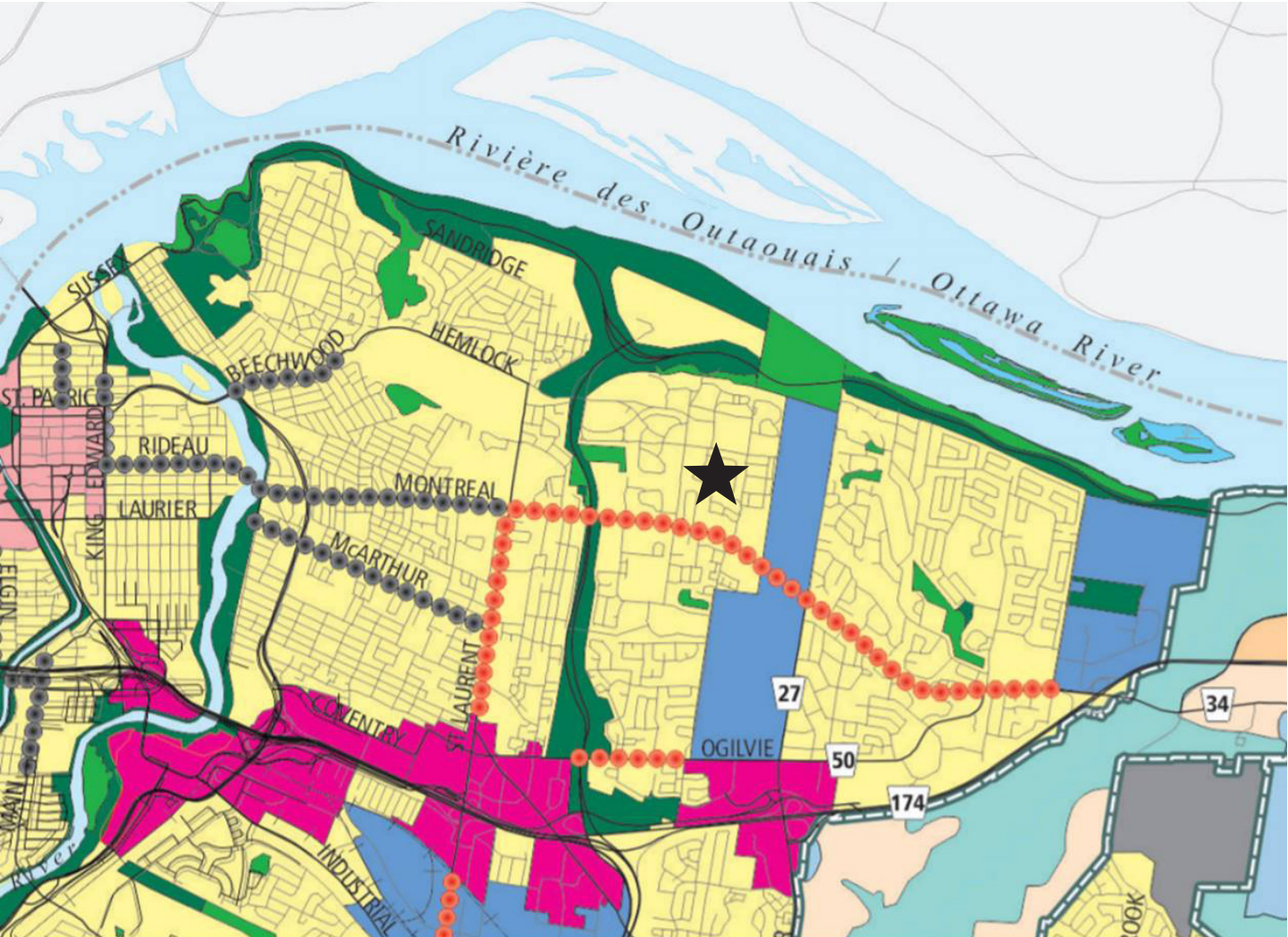
Section 2.5.1 – Designing Ottawa, of the Official Plan, contains the policies that encourage good urban design and innovative architecture to stimulate the development of community places with unique character, that are attractive for people to live, work and socialize. Generally, design review will include matters such as built form, open spaces and infrastructure.

OFFICIAL PLAN DESIGN OBJECTIVES

1. To enhance the sense of community by creating and maintaining places with their own distinct identity.
2. To define quality public and private spaces through development.
3. To created places that are safe, accessible and are easy to get to, and move through.
4. To ensure that new development respects the character of existing areas.
5. To consider adaptability and diversity by creating places that can adapt and evolve easily over time and that are characterized by variety and choice.
6. To understand and respect natural processes and features in development design.
7. To maximize energy-efficiency and promote sustainable design to reduce the resource consumption, energy use, and carbon footprint of the build environment.

Section 4.11 of the Official Plan contains policies on Urban Design and Compatibility. The purpose of the policies in the section is to lay the groundwork for requiring high quality urban design. The design and compatibility of the proposed development application conforms to these policies, as well as the design objectives in Section 2.5.1.

The content within this Design Brief is provided in response to Official Plan policies contained in Sections 2.5.1 – Designing Ottawa, 4.11 – Urban Design and Compatibility and 5.2.1.7 – 5.2.1.8 – Site Plan Control Area. Architectural elevations, renderings, and floor plans are included, as well as Shadow and Wind Analysis for the proposed development. These materials are of sufficient scope to illustrate how the proposed development fits and is compatible with the existing community context. Matters of views, building design, massing and scale, outdoor amenity areas and public art are addressed. The materials also provide details on the architectural design, materials and finishes, as well as the sustainable design features of the project. Considerable effort and intention have also been placed on incorporating elements of design that celebrate the Algonquins of Ontario history and culture.



Former CFB Rockcliffe Community Design Plan

FORMER CFB ROCKCLIFFE COMMUNITY DESIGN PLAN

A Community Design Plan (CDP) was completed in 2015 for the former CFB Rockcliffe lands. The CDP identified an opportunity for approximately 9,800 residents and 2,600 jobs at build-out within 15-20 years. The CDP is a guiding document but the Secondary Plan and implemented zoning provide the detailed direction for future development.

The CDP is based on policy direction from the Provincial Policy Statement (2014), the City of Ottawa Official Plan (2013), as well as the Residential Land Strategy for Ottawa (2009), all of which identify the former CFB Rockcliffe site as an opportunity for intensification outside the City’s existing target areas. Setting density targets in the CDP helps to better plan for infrastructure and services needed to support growth, and benchmarks help the City justify and plan for the provision of various levels of transit.

Other policy and guideline documents that should be referenced in conjunction with the CDP include the Transportation Master Plan, Infrastructure Master Plan, Pedestrian Plan, and Cycling Plan.

The CDP also speaks to affordable housing, noting that it will be dispersed throughout the community, will be mixed with other housing types and may include purpose-built rental housing, supportive housing, and not-for-profit subsidized housing.

The City of Ottawa and Canada Lands Company have pursued partnerships with private, public, and non-governmental sectors to accommodate affordable housing projects in the new community. In addition to participation in multi-party partnerships to secure the resources necessary to sustain a range of affordable housing types, the City of Ottawa and Canada Lands Company will facilitate affordable housing by allowing alternative development standards on a case-by-case basis, such as reduced parking requirements.

The parking policies in the CDP indicate that where practical, the reduction of minimum and maximum parking requirements will be encouraged. Furthermore, limited amounts of surface parking may be accommodated within the Core, either in a small number of surface parking spaces in the interior of blocks or associated with short stay parking for businesses and residential visitors, which demonstrate high urban design standards for screening, interior and exterior landscaping, and utilize permeable pavements for groundwater recharge.

The CDP includes policies for achieving sustainable development, which is consistent with the City’s goal of promoting environmental, economic and social sustainability. It is intended that affordable housing will incorporate innovative and flexible design to accommodate a wide range of residents and needs. Such design will provide for adaptive use and re-use over the long term.

WATERIDGE VILLAGE

Community Vision

Establishing a high level of urban design is critical in creating new developments that are enjoyable places to live, work and socialize. The subject property, legally described as Block 21 on Plan Subdivision 4M-1581, within Phase 1B of Wateridge Village, is designated as a ‘design priority area’ thereby subject to review for contribution to an enhanced pedestrian environment and its response to the distinct character and unique opportunities of the area. To its east lies the Rothwell Village neighbourhood; to its south lies the Carson Grove neighbourhood; to its west lies the Manor Park neighbourhood.

Concept Plan

CORE NEIGHBOURHOOD

Zoning | Scale

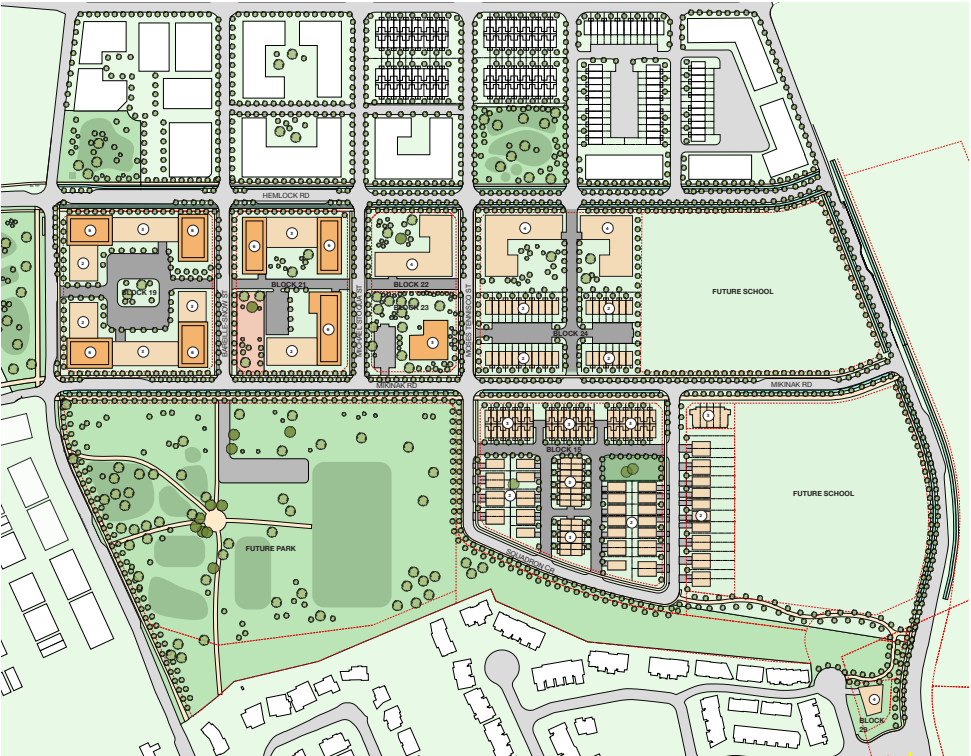
Within the CDP, the subject lands are identified as being at the heart of the 9-block mid-rise mixed-use ‘Core’ neighbourhood. Its prime location in close proximity to major parks is a place where residents, those that work in the area and visitors can gather and socialize. Building height is limited to 30 metres and active street frontage on Hemlock and Mikinak roads is emphasized.

Public Space | Private Space

The overarching goal for the ‘Core’ neighbourhood is to have a compact, pedestrian-oriented community with a variety of residential and employment uses. Mixed-use must include active frontages adjacent to areas of high pedestrian circulation. Street level units are used to articulate the building façades and to generate street level public activity. Buildings should create a fine-grained streetscape with individual units and entrances expressed within modulated, articulated building façades. Increased glazing is required to enhance access and transparency. Separation of communal spaces within developments and where applicable private outdoor spaces to be emphasized.

Pedestrian | Vehicular Interface

Surface parking areas are to be located within the interior of the development blocks and separated from parks and open spaces. Entrances to above-grade parking areas are to be directed to minor roads wherever feasible, to foster a pedestrian-oriented streetscape environment. A high-quality public realm is envisioned to ensure pedestrian and cycling-friendly streets. Access to the regional road network is via signalized intersections on Montreal Road at Codd’s Road and at Wanaki Road, as well as Aviation Parkway to the west via Hemlock Road. Two collector roads -- Hemlock Road and Mikinak Road in addition to two local roads – Barielle Snow Street and Michael Stoqua Street serve the subject site. Hemlock Road will provide grade-separated cycle tracks on both sides while Mikinak Road will receive a multi-use path on its south side.



Adjacent Development Site Plan
(Q4A Architecture)

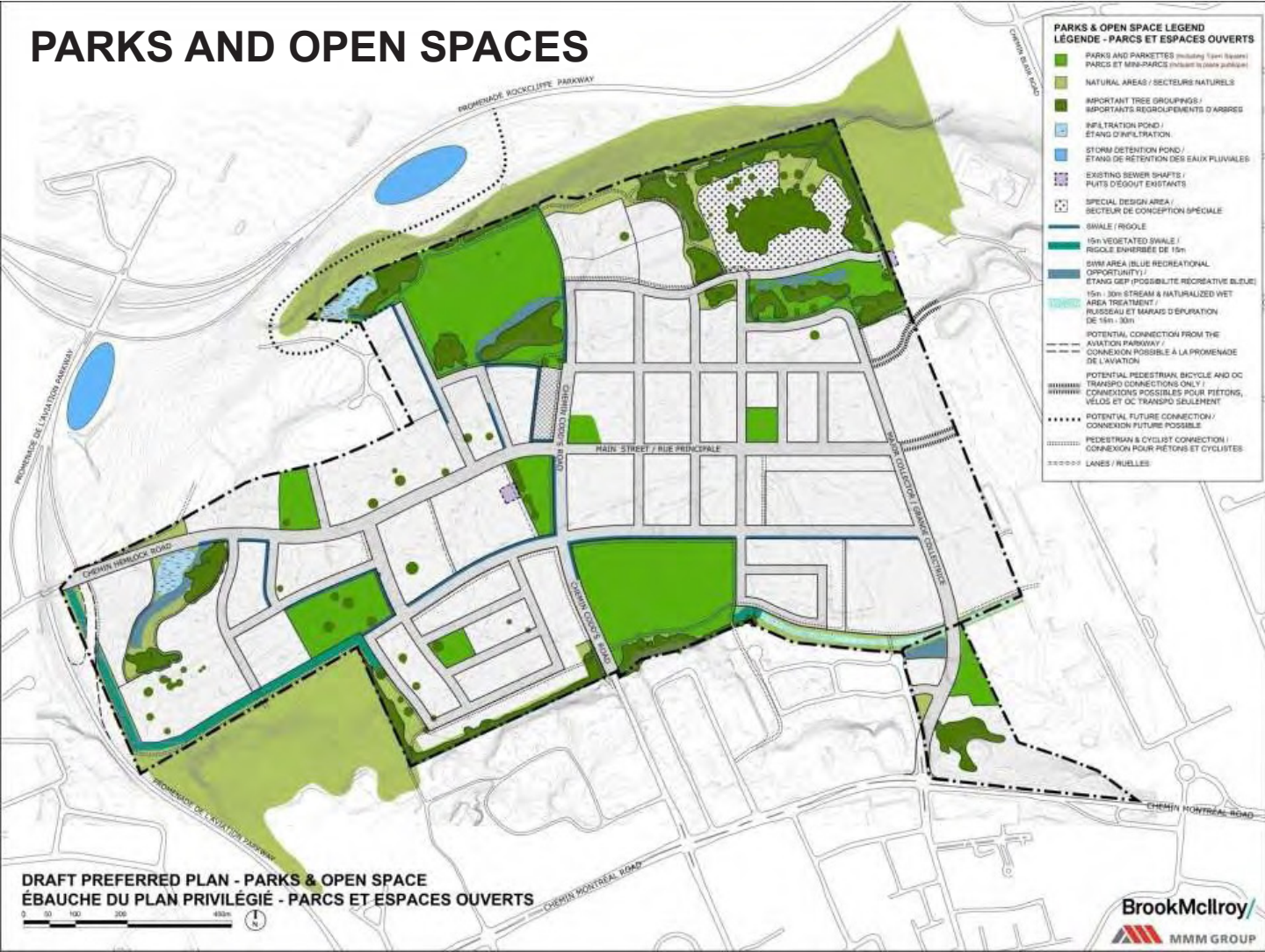
Natural Context

The Mikinak Redevelopment does not have an existing natural context due to the land having served as a military base, the former CFB Rockcliffe. Future green spaces in the vicinity include: to the northeast, a half-block of green space at the corner of Hemlock Road / Moses Tennisco Street; to the northwest, a quarter-block of green space at the corner of Hemlock Road / Codd’s Road; and directly to the south, a planned park, Eugène Martineau Park. This public park to be linked with a “green corridor” in the east-west direction, passing Squadron Crescent and linking to Wanaki Road.

These green spaces within walking distance of the Block 21 site, created by the Master Plan, include stormwater ponds and “green streets”.

The intent is to continue with the Master Plan requirements to augment the tree canopy, design landscaping that assists in the absorption of rain / snow fall into the natural water system and not burden the existing infrastructure, minimizing the need for human intervention and public spending.

Due to the geographic and environmental conditions of Ottawa, an on-site snow storage area will be considered for winter months. It will be integrated with the landscape area adjacent to the surface parking area.



Secondary Plan

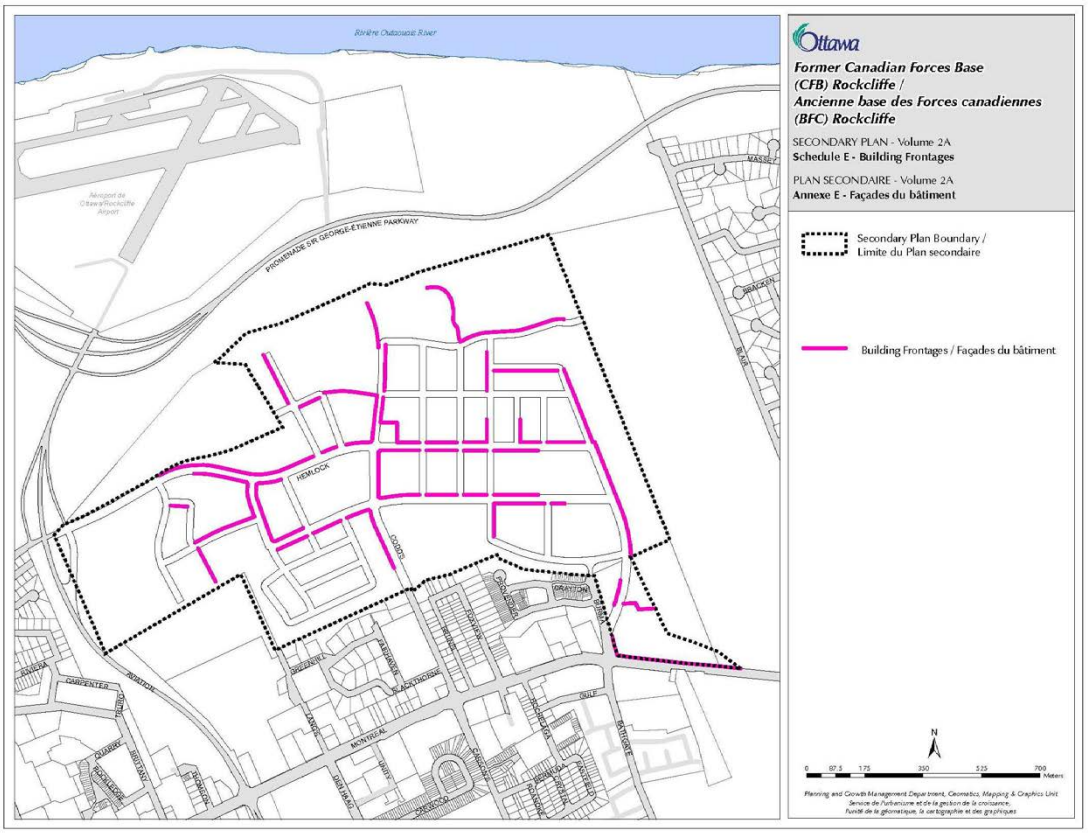
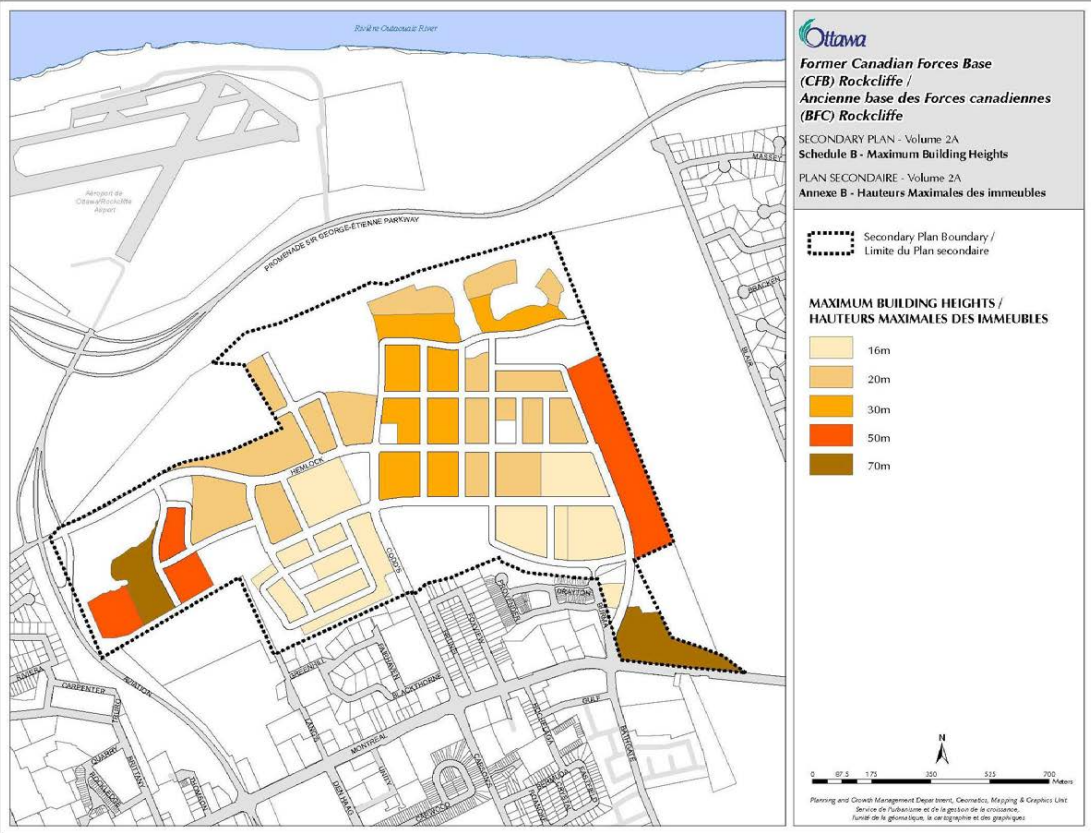
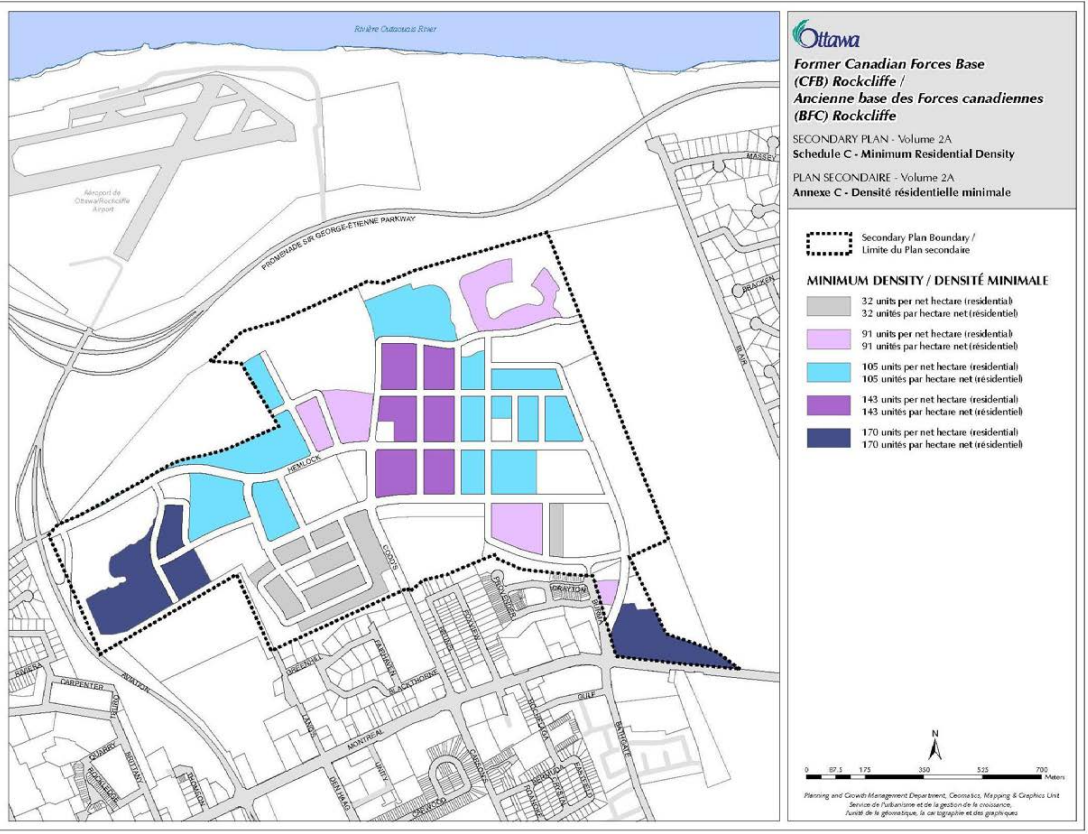
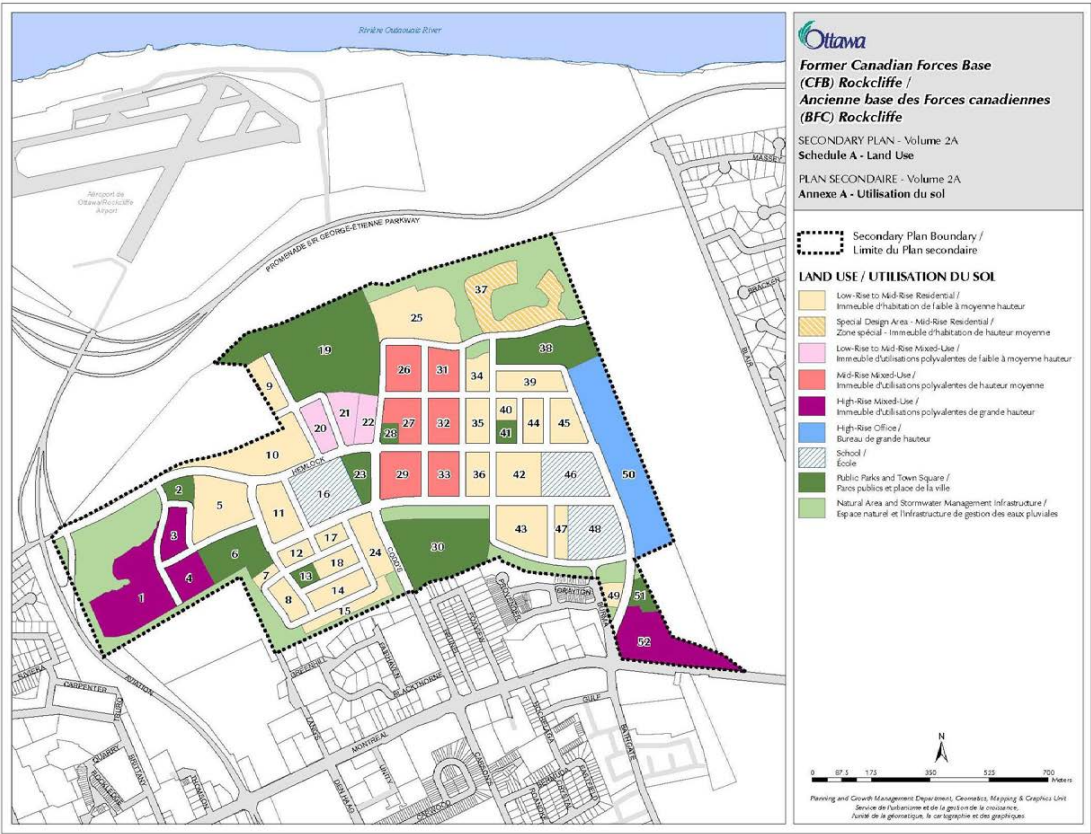
FORMER CANADIAN FORCES BASE (CFB) ROCKCLIFFE SECONDARY PLAN

The purpose of the former CFB Rockcliffe Secondary Plan (the Secondary Plan) is to guide future growth and development on the former CFB Rockcliffe lands, by providing policy direction on land use, densities, building heights, open space, and mobility. The Secondary Plan is based on the CDP and translates key aspects of the CDP into statutory policy. The Secondary Plan includes Schedules A through F, that are read in conjunction with the policy direction.

As per the Secondary Plan, “the vision for the development area is of a contemporary mixed-use community that is walkable, cycling-supportive, transit-oriented and built at a human scale. The site development will connect to the history of the Algonquin people, celebrate its military heritage and demonstrate urban design and landscape excellence”.

CFB ROCKCLIFFE SECONDARY PLAN – SCHEDULES	715 Mikinak Road (Block 33 on Schedules)
Schedule A – Land Use	Mid-Rise Mixed-Use
Schedule B – Building Heights	30 meter maximum
Schedule C – Minimum Residential Density	143 units per net hectare minimum density
Schedule D – Mobility Network	Cycle tracks – Hemlock Rd; Multi-use Pathway – Mikinak Rd
Schedule E – Building Frontages	Building frontages – Hemlock Rd & Mikinak Rd
Schedule F – Public Rights-of-Way	Hemlock Road – 24 m ROW Mikinak Road – 26 m ROW

Secondary Plan Schedules



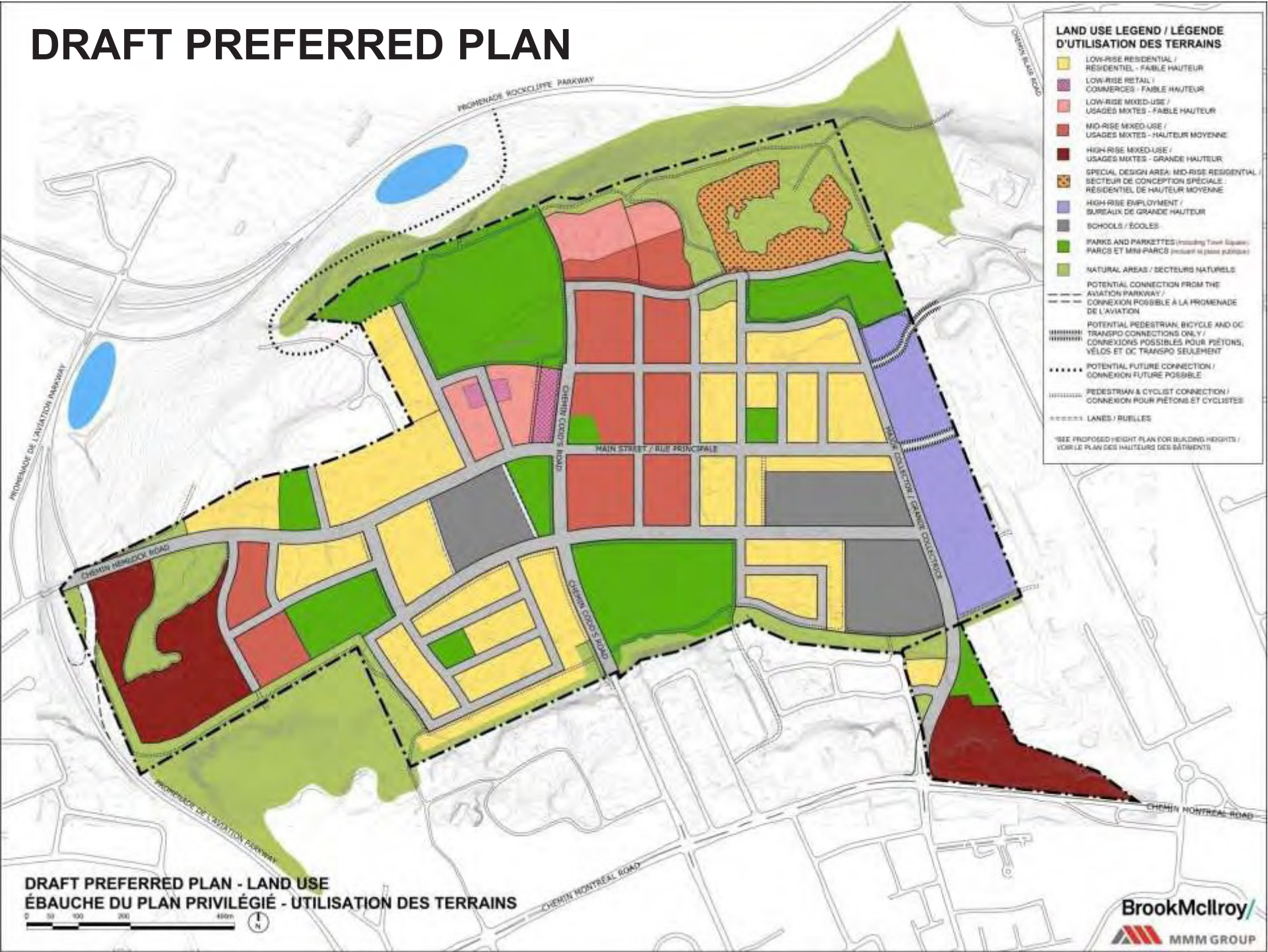
Implementation & Development Approvals

The policies of the Secondary Plan, along with the CDP and Official Plan policies, provide the framework to guide future development in the area. Implementation and interpretation are in accordance with the policies of the Official Plan for the City of Ottawa.

As per the Secondary Plan, a Plan of Subdivision for the entire Former CFB Rockcliffe CDP area was required to establish the public streets, blocks, areas for stormwater management infrastructure, public parkland and open space which are generally in accordance with the configuration depicted in the Secondary Plan Schedules. Public streets, parks and open spaces have been dedicated to the City as a condition of the subdivision approval.

A Plan of Subdivision application and associated rezoning was filed in 2015 for the redevelopment of the 131-hectare CDP parcel, which was named Wateridge Village. The subject property is legally described as Block 21 on registered Plan of Subdivision 4M-1581, within Phase 1B of Wateridge Village. Block 21, municipally known as 715 Mikinak Road, is bounded by Hemlock Road to the north, Bareille-Snow Street to the west, Mikinak Road to the south, and Michael Stoqua Street to the east.

Establishing a high level of urban design is critical in making new development enjoyable places to live, work and socialize. To ensure urban design is not overlooked as communities develop and change over time, the City has identified design priority areas. In design priority areas, all private and public developments, and community partnerships within and adjacent to the public realm will be reviewed for their contribution to an enhanced pedestrian environment and their response to the distinct character and unique opportunities of the area. Although the subject lands are not located within a defined design priority area, the Secondary Plan includes policies that require Site Plan Control applications for lands located within Mixed-Use designations on Schedule A – Land Use in the Secondary Plan, to be subject to review by the City’s Urban Design Review Panel. This requirement will be addressed through the Site Plan Control application for the subject lands.



Urban Context

INTRODUCTION – PLACE, PATH AND PEOPLE

Creating a sense of ‘place’ within the fabric of a city, region, neighbourhood and site depends upon the delicate balance of massing, rhythm, scale, streetscape patterns and the weaving of public, communal and private spaces. Sensitivity to integrating ‘path’ within and surrounding the development will weave harmoniously the new into the existing as well as anticipate the developing. Instilling a sense of belonging to ‘people’, be it in the public or private realm, achieves the cultural and economic aspirations for social equity through affordable housing.

CITY OF OTTAWA

Master Plan | Secondary Plan | Community Design Plan (CDP)

The subject property, municipally known as 715 Mikinak Road, is one part of the 131-hectare parcel of land of the former CFB Rockcliffe. It is ideally located south of the Ottawa River, east of the downtown core and within the Ottawa Greenbelt. It allows for more intensive development than typical suburban expansion but at a lower scale that what would be appropriate for the downtown core. The site has the potential to be reconnected to the urban fabric of the City, while creating a highly desirable mixed use, mid-rise, pedestrian-oriented community

Landmarks | Infrastructure | Movement Patterns

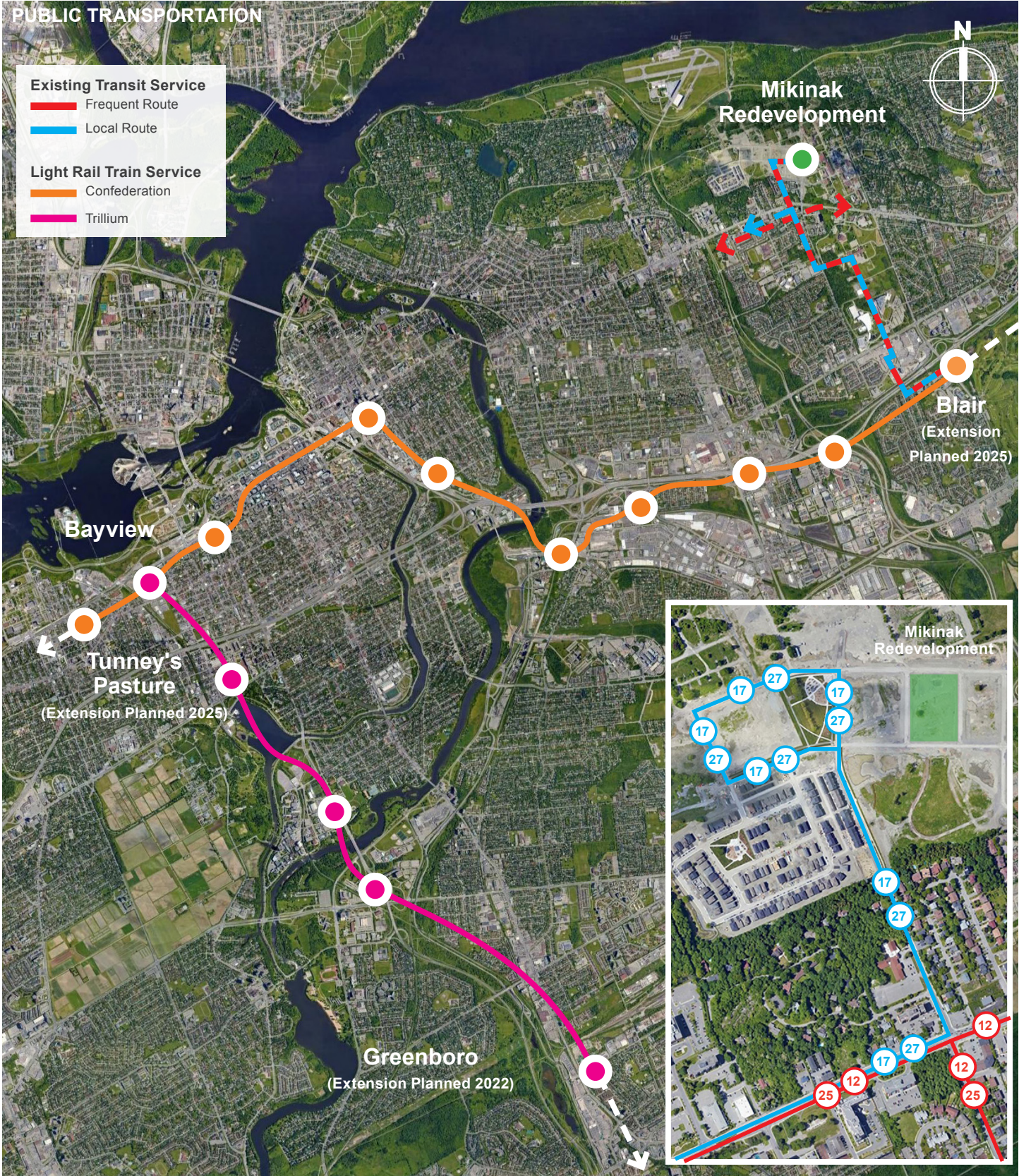
Parliament Hill and Lansdowne Park lie to the southwest, Via Rail Train Station and Ottawa International Airport lie to the south, Montfort Hospital and Montfort Woods lie to the southwest and the National Research Council lies to the east. The parcel of land is bound by Sir George-Étienne Cartier Parkway to the north, Blair road to the east, Montreal Road to the south and by Aviation Parkway to the west. The CDP Parking policies encourage, where practical, the reduction of minimum and maximum parking requirements to encourage the use of public transportation and the walkability factor of the community.

Cultural | Social | Economic Environment

The former CFB Rockcliffe lands are identified as an opportunity for residential intensification for approximately 9,800 residents and 2,600 jobs within 15-20 years. These density targets will be used to better plan the infrastructure and services needed to support growth while the benchmarks help the city justify and plan for the provision of various levels of transit from the subject lands to the various landmarks, institutions and green spaces. The CDP speaks to the provision of affordable housing, dispersed throughout the community. Sustainable developments are pursued to align with the City’s goal of promoting cultural, social and economic sustainability. It is intended that affordable housing will incorporate innovative and flexible design to accommodate a wide range of residents and needs. Such design will provide for adaptive use and re-use over the long term.



Network



Mikinak Site

Topography | Microclimate | Massing

The relatively flat topography of the subject site facilitates the siting and disposition of the triad of buildings. The prevailing northwesterly winds dictated the orientation of Building A and Building B to protectively frame the northwestern corner of the site to protect/provide a microclimate for the interior courtyard containing the communal outdoor amenity spaces. The roof areas are maximized to benefit from the solar path for on-site energy production via PV arrays. The massing of each building is optimized to meet the required program and the stringent Sustainability | Passive House | Net Zero performance targets while introducing minimal jogs in the envelope to break the volume and create a human-scaled residential feel.

Streetscape | Framing Character

The primary elevation of Building A frames the entire length of the Hemlock Road streetscape with increased glazing to emulate the non-residential look and providing private patios for the grade-level residential units. The primary elevation of Building B frames the majority of the length of Barielle Snow Street streetscape with private patios for the grade-level residential units. The primary elevation of Building C frames the majority of the length of Mikinak Road with an anchor at the corner of Michael Stoqua Street. Site elevations illustrate the scale and rhythm of the facades for both the public and private (courtyard) interfaces using materiality texture and colour to proportion the volumes. The interior courtyard is subdued and calming framing the perimeter vehicular/pedestrian circulation and outdoor communal and service spaces.

Public Realm | Communal Open Spaces | Private Open Spaces

The animated public realm along Hemlock Road to the north, Mikinak Road to the south and Barielle Snow Street to the west serve simultaneously to protect the communal outdoor amenity spaces shared by the tenants. There are communal children’s playgrounds, garden, outdoor gathering and BBQ spaces. In certain instances, private outdoor spaces are provided at ground-level residential units for Buildings A and B. Between Building B and C, a visual link is created to the future public park, linking green with green. Public walkways are at the perimeter of the site while internal walkways provide safe pedestrian and vehicular movement for separation from the urban context or ability to integrate into it, at the tenant’s choosing.

Activities | Relationships

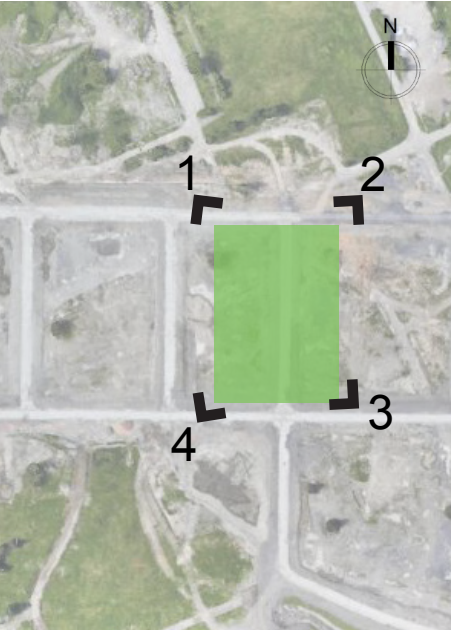
The increased glazing percentages at grade, individual non-residential entries, private patios and protected main entrances provide the opportunity for public “eyes on the street” and a secure relationship for the tenants. Within the protected private courtyard, tenant relationship s can be fostered as part of the Mikinak family, where each individual is valued, regardless of race, gender, ability or income in the combination of materiality colour whose adjacencies appear random and is reflective of society as a whole. Tenants can choose to find quiet areas, active areas with appropriate seating to accommodate single to multi-individual families.

CONCLUSION – PLACE, PATH AND PEOPLE

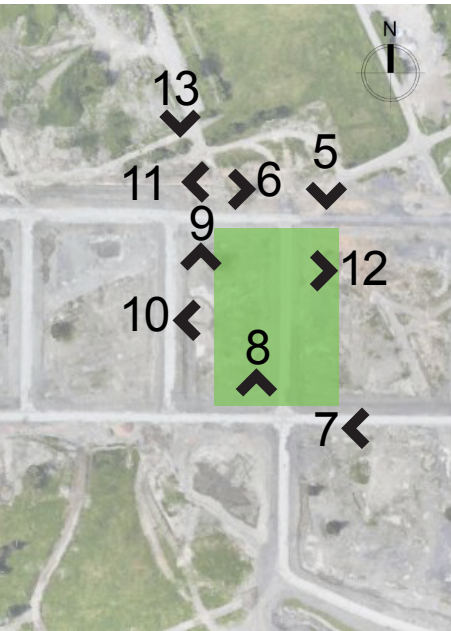
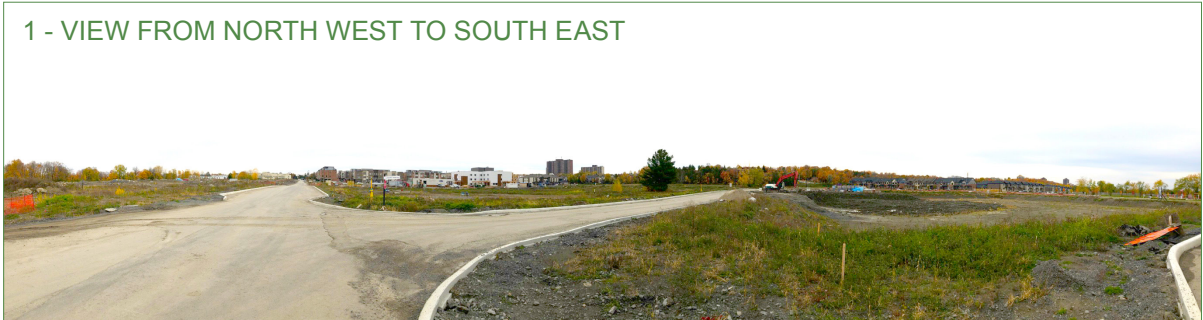
The Mikiank Redevelopment will create a sense of ‘place’ within the Wateridge Village regenerated on the former CFB Rockcliffe though its intelligent juxtaposition of massing with streetscape rhythm and scale. The weaving of public, communal and private spaces with architectural and landscape elements allows the tenant to select the level of privacy or activity desired. Visual and literal ‘path’ connections weave throughout the spaces providing a pedestrian-oriented complex and a connectivity to the wider urban fabric. The use of materiality and colour to provide an ever-changing human perspective, whether viewing from the public or private realm, provides ‘people’ with a relationship of their choosing, each individual valued and joined in a ‘quilt’ to attain the desired goal of social equity through the provision of durable, energy-efficient, relateable affordable housing.



Existing and Adjacent Conditions



SITE PHOTO KEY MAP



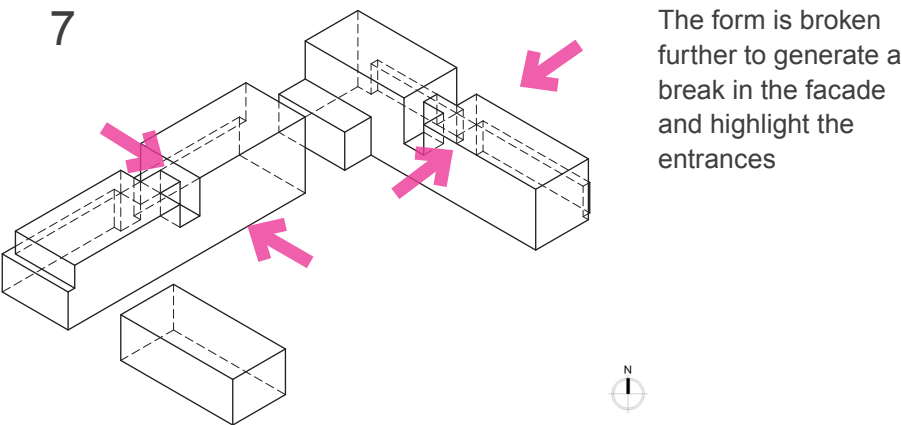
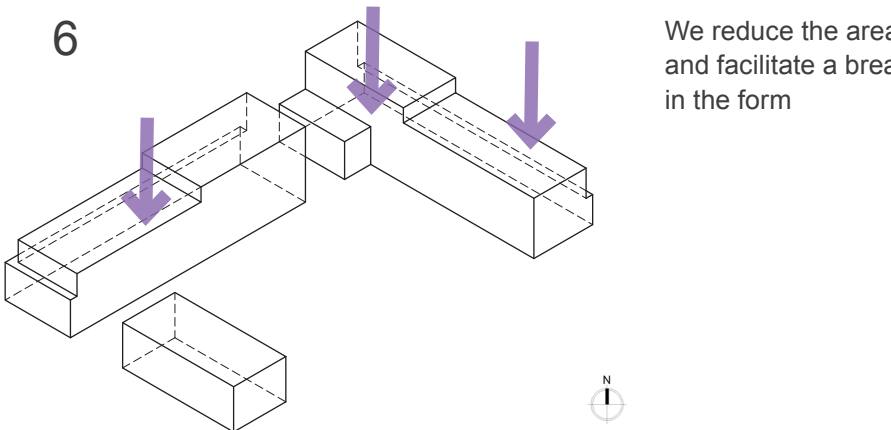
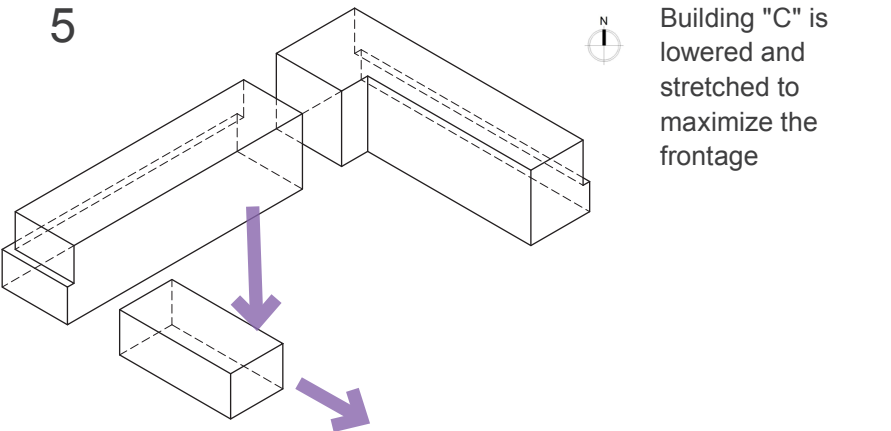
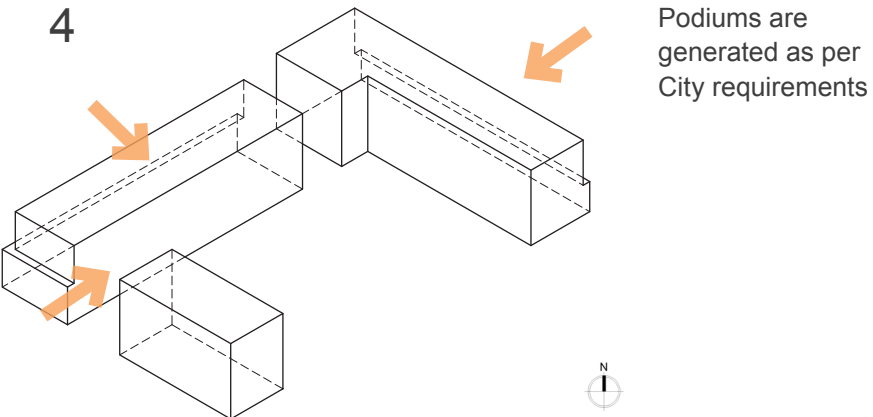
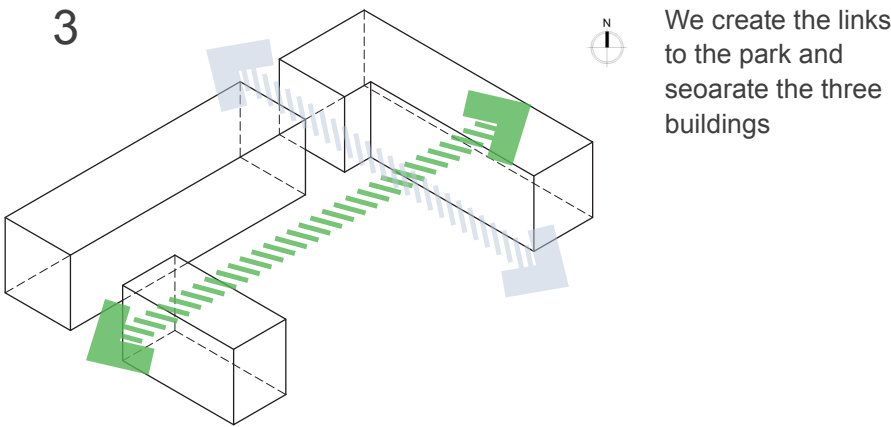
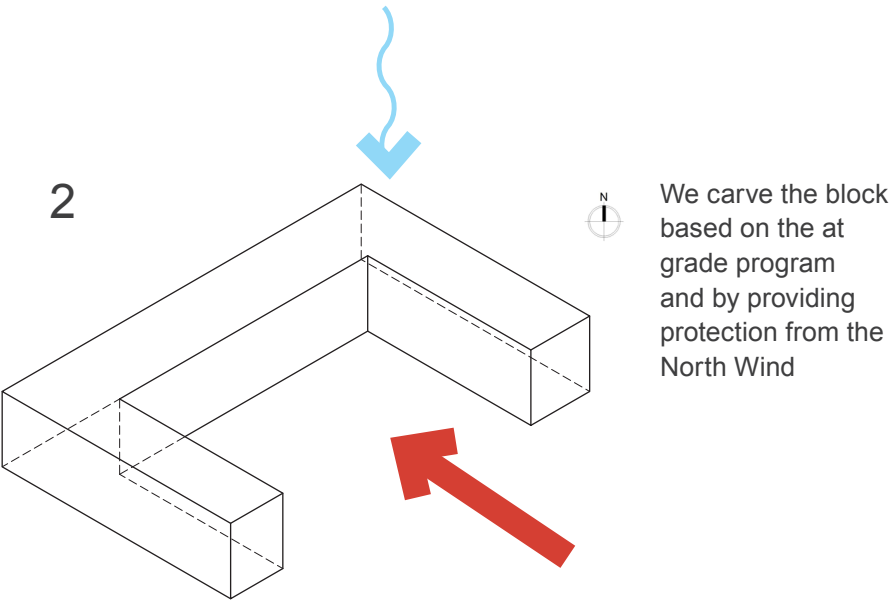
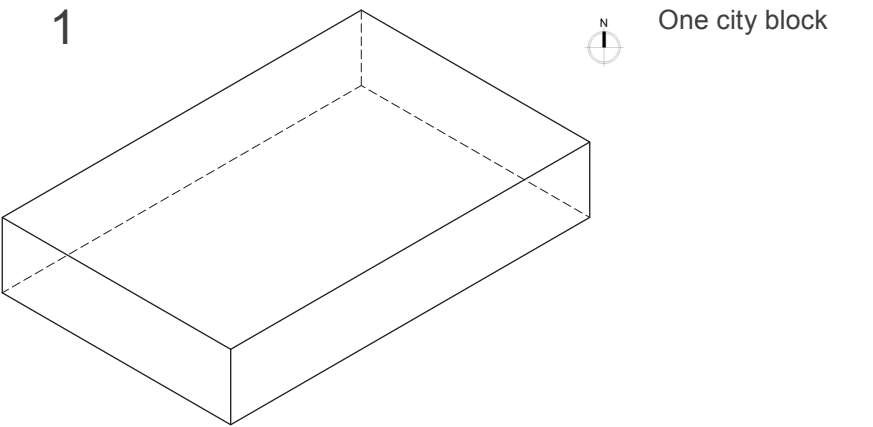
SITE PHOTO KEY MAP



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Section 2: Design Proposal

Building Massing

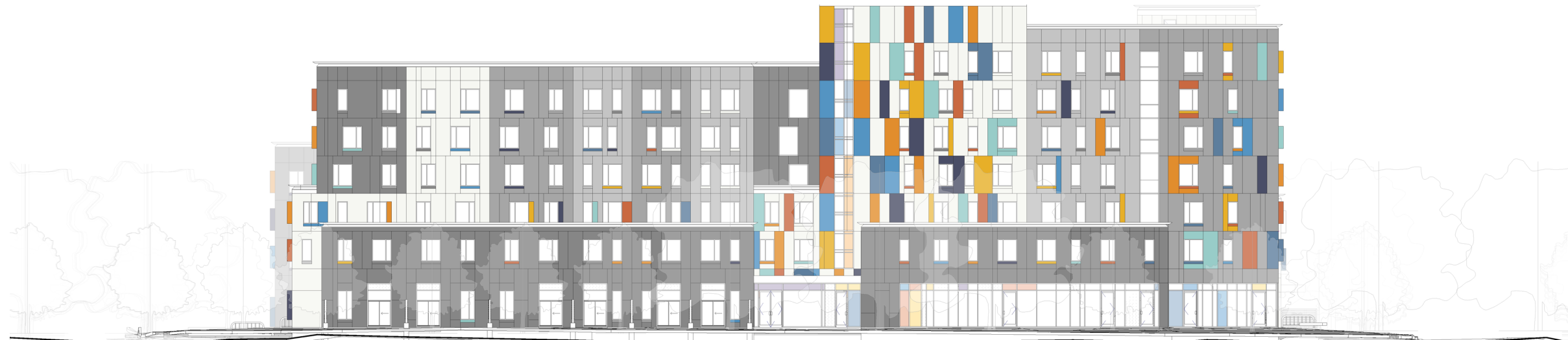




EXTERIOR – MIKINAK ROAD ELEVATION



EXTERIOR – MICHAEL STOQUA STREET ELEVATION



EXTERIOR – HEMLOCK ROAD ELEVATION



EXTERIOR – BARIELLE SNOW STREET ELEVATION



COURTYARD – NORTH ELEVATION



COURTYARD – EAST ELEVATION



COURTYARD – SOUTH ELEVATION

Views



NORTH EAST BIRD'S-EYE VIEW



NORTH WEST BIRD'S-EYE VIEW



SOUTH WEST BIRD'S-EYE VIEW



SOUTH EAST BIRD'S-EYE VIEW



SOUTH WEST VIEW LOOKING TOWARD S NORTH EAST CORNER OF MIKINAK ROAD AND BARIELLE SNOW STREET



SOUTH EAST CORNER LOOKING TOWARDS THE NORTH WEST CORNER OF MIKINAK ROAD AND MICHAEL STOQUA STREET



NORTH EAST VIEW LOOKING SOUTH WEST CORNER OF HEMLOCK ROAD AND MICHAEL STOQUA STREET



NORTH WEST CORNER VIEW LOOKING SOUTH EAST CORNER OF HEMLOCK ROAD AND BARIELLE SNOW STREET

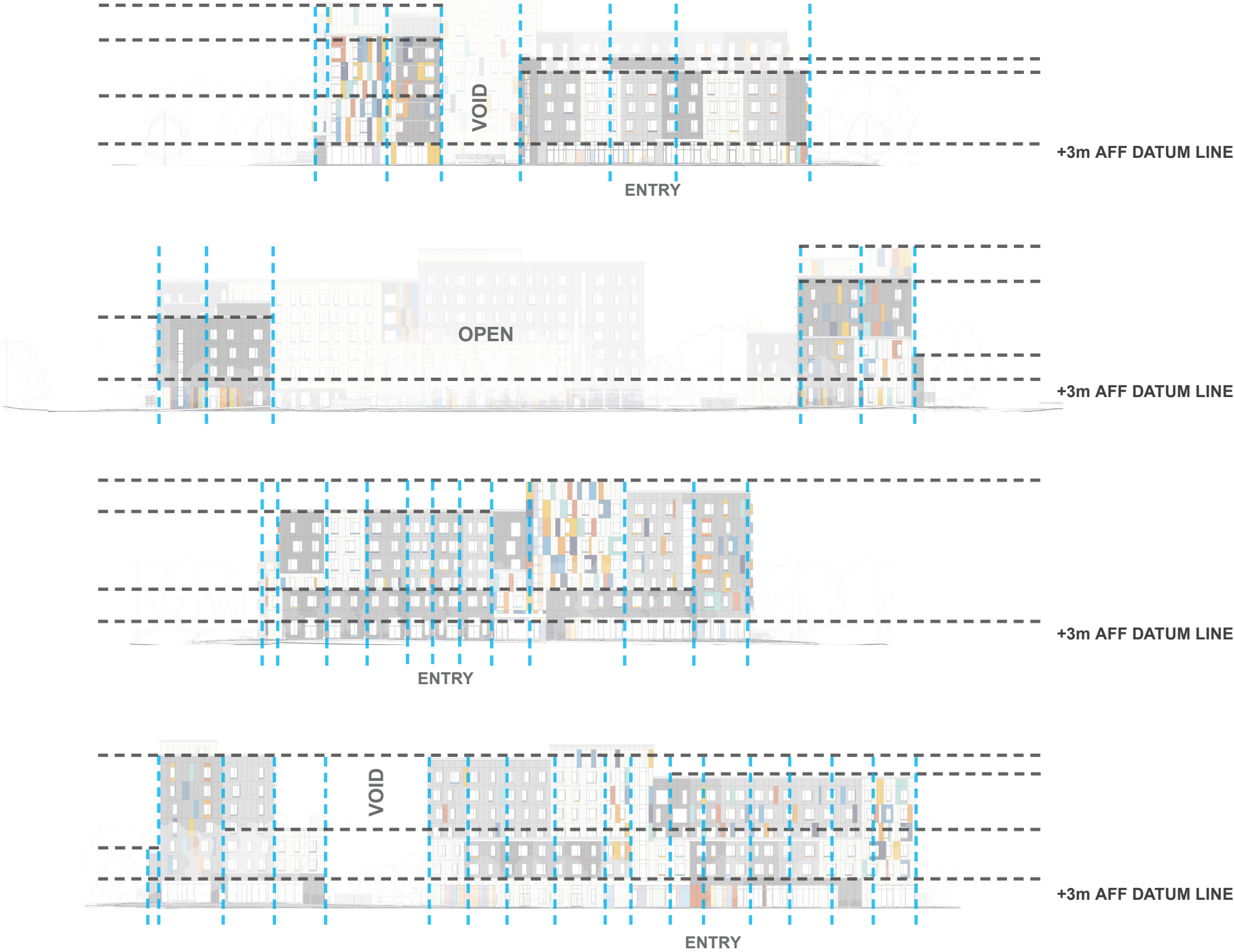
Building Transition

SCALE AND RHYTHM

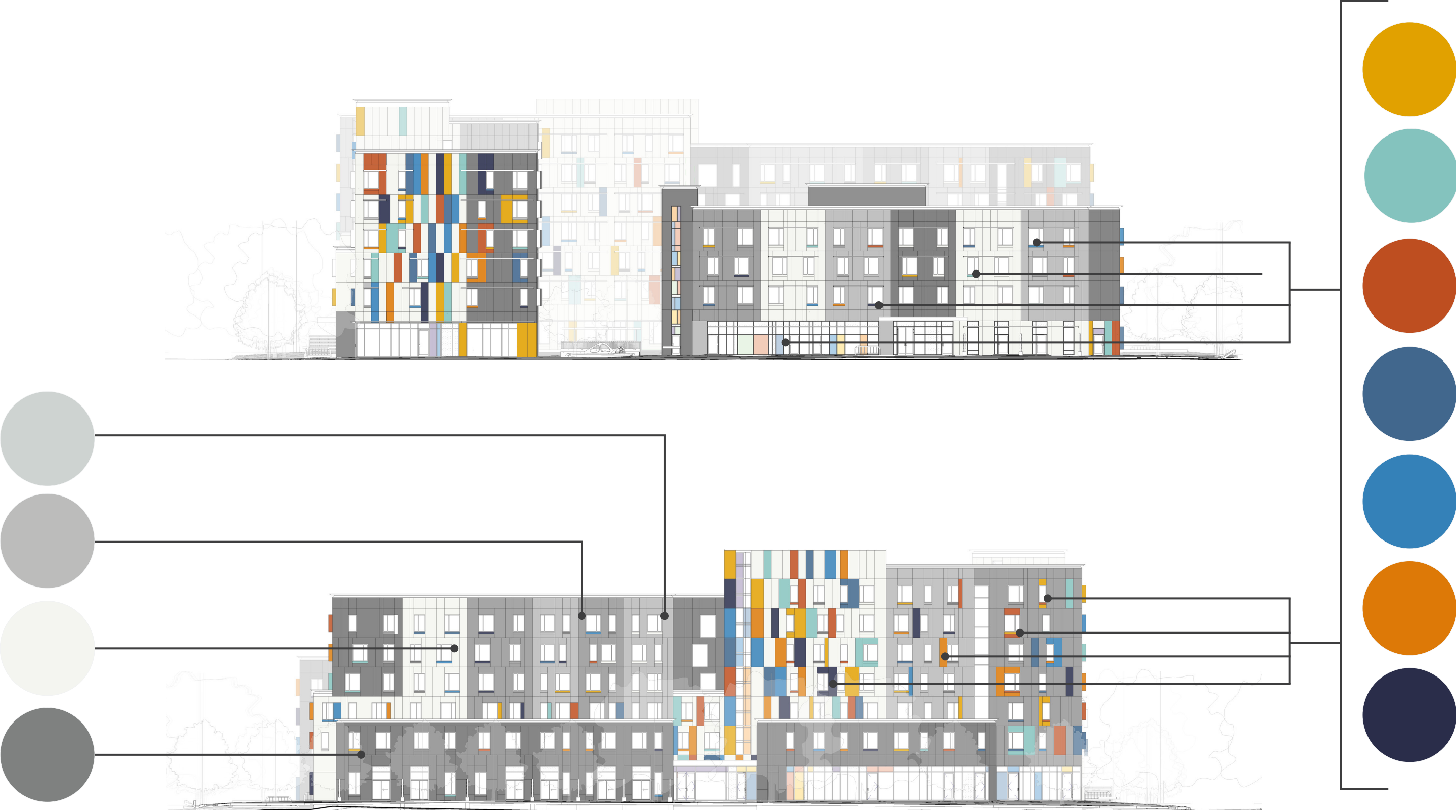
Vertical lines illustrate the strategy of using material changes in texture and colour to proportion the facades horizontally into a human-related scale and rhythm.

Vertical lines illustrate the strategy of using material changes in texture and colour to align the building massing to meet City Zoning requirements and proportion the facades vertically into a human-related scale and rhythm.

The blue dashed lines need to be aligned with the updated elevations to illustrate the strategy of using materiality + colour to divide the long facades into portions whose rhythm are human-scaled. The black dashed lines need to be aligned with the updated elevations to illustrate the vertical distribution of the massing based on City requirements and design of a human-scaled podium base.



Expression and Materiality



Alternative Building Massing

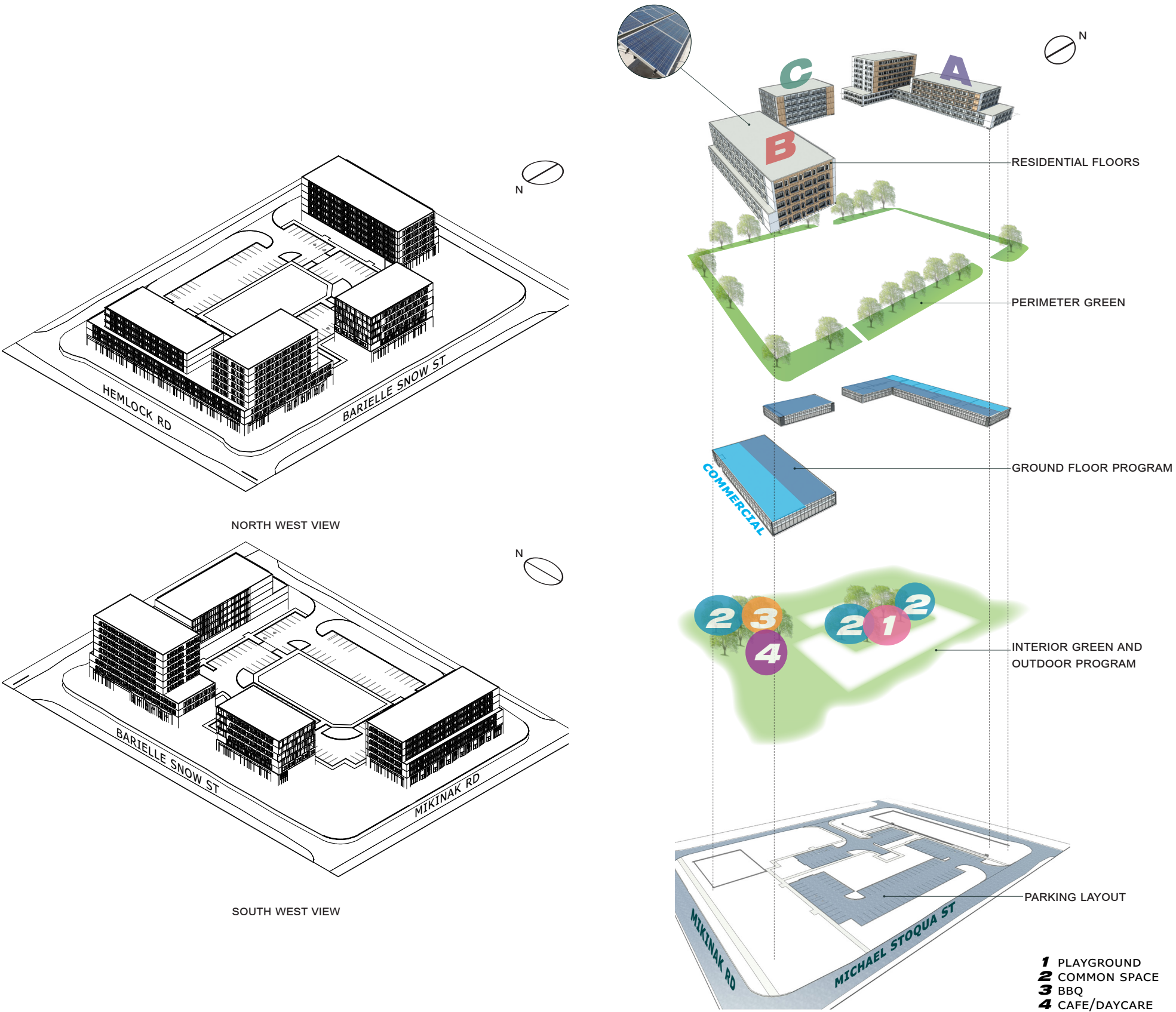
OPTION 1: LUDIC

SITE:

The triad of buildings are arranged to provide protection from the northwest winds. Both the northwest and northeast corner of the block are framed by the massing of Building A, within its “L” shaped configuration, there is a 6-storey tower and a 9-storey tower sharing a 3-storey podium. The southeast corner is framed by Building B, with its rectangular 6-storey configuration. The center quadrant of the west side of the block is focused on Building C, with its modest rectangular 6-storey configuration. An outdoor roof-top amenity space can be considered in the open space between the towers of Building A, accessible to residents.

SITE ACCESS:

A delicate balance is demonstrated between the need for safe pedestrian access to the outdoor amenity and green spaces while meeting the required parking numbers. Vehicular access is from the east side street, Michael Stoqua St., with perimeter parking zones adjacent to the inner, private facades of each building. Pedestrian access is separated from the parking zones with wide passages to the shared “central park” outdoor amenity spaces. Pedestrian access from building to building is buffered against the parking zones. With the parking located close to each building, this site arrangement emphasizes “accessible”, and “easy to reach”. This option integrates vehicular access and pedestrian-friendly activity without compromise.



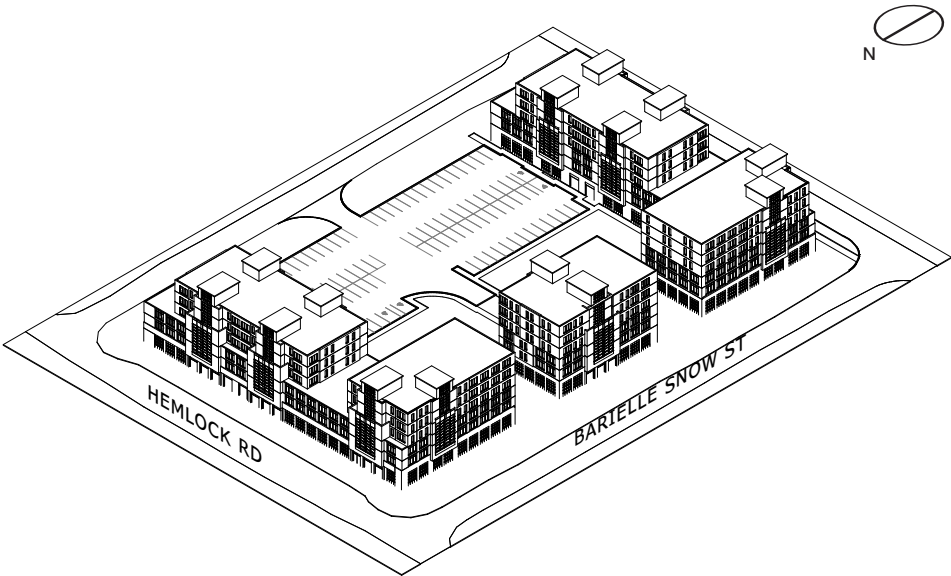
OPTION 2: HARMONIZED

SITE:

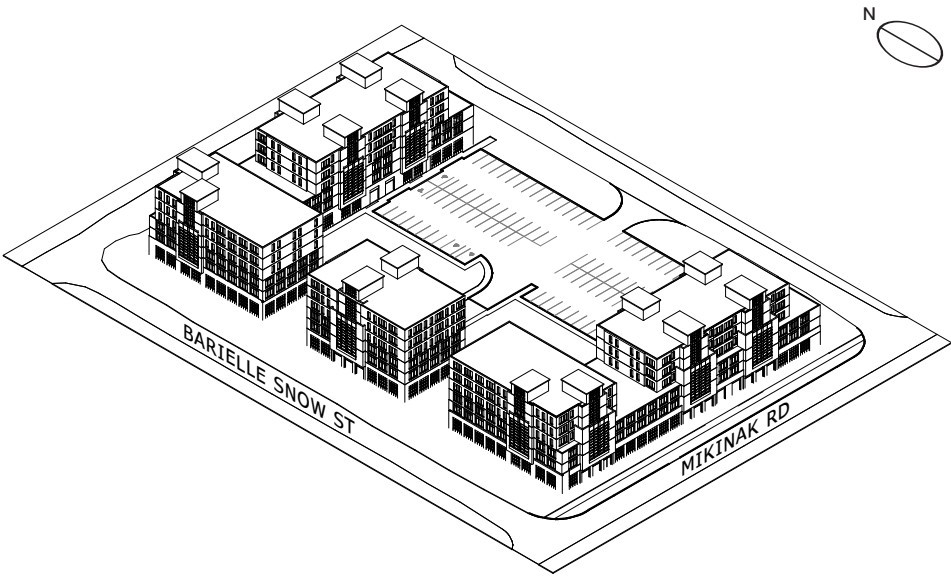
The triad of buildings are arranged to provide full-length street frontage for the northern Hem-lock Rd and its southern Mikinak Rd. All four corners of the block are framed by the massing of twin Buildings A and B. Each twin extends the long arm of its “L” shaped configuration along the primary street, sheltering the development with 6-storey volumes. The east side of the site, along Michael Stoqua St. remains open to the surrounding urban context. The center quadrant of the west side of the block, along Barielle Snow St. is focused on Building C, with its modest rectangular 6-storey configuration. An outdoor roof-top amenity space can be considered in the open space between the towers of Buildings A, providing views to the river that are accessible to residents. Similarly, an outdoor roof-top amenity space can be considered in the open space between the towers of Buildings B, providing views to the future park, accessible to residents.

SITE ACCESS:

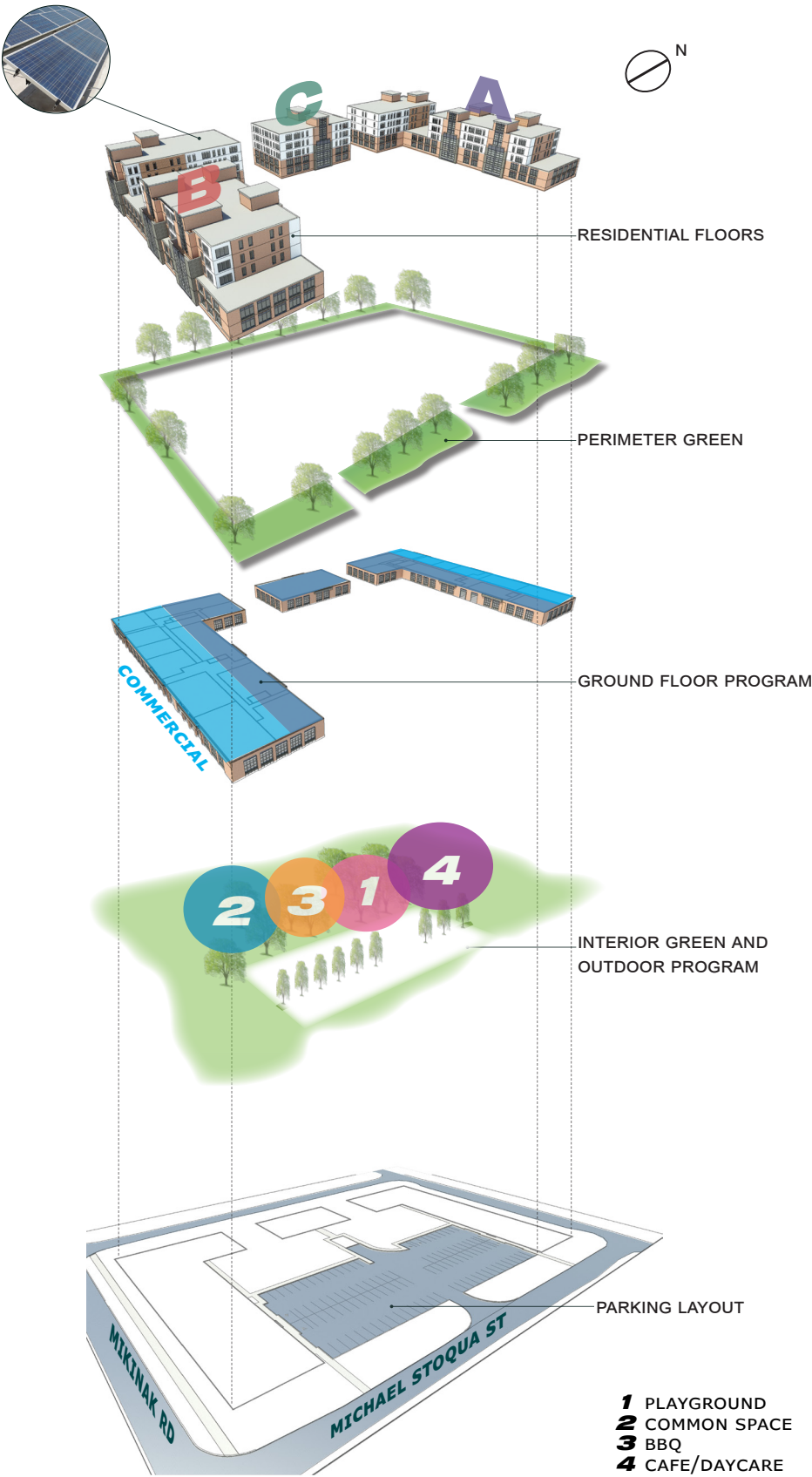
Required parking numbers are met with the creation of a parking cluster to the east of the site, framed by the protective arms of twin Buildings A and B. Vehicular access is from the east side, Michael Stoqua St., with one dense parking zone running in the north-south direction. Pedestrian access is along the inner courtyard length of twin buildings A and B. Pedestrian walkways connect around the perimeter of the parking zone with access to the eastern side of the site, Michael Stoqua St. With the parking located close to each of Building A and B, the immediate perimeter of Building 3 is unencumbered with vehicular traffic.



NORTH WEST VIEW



SOUTH WEST VIEW



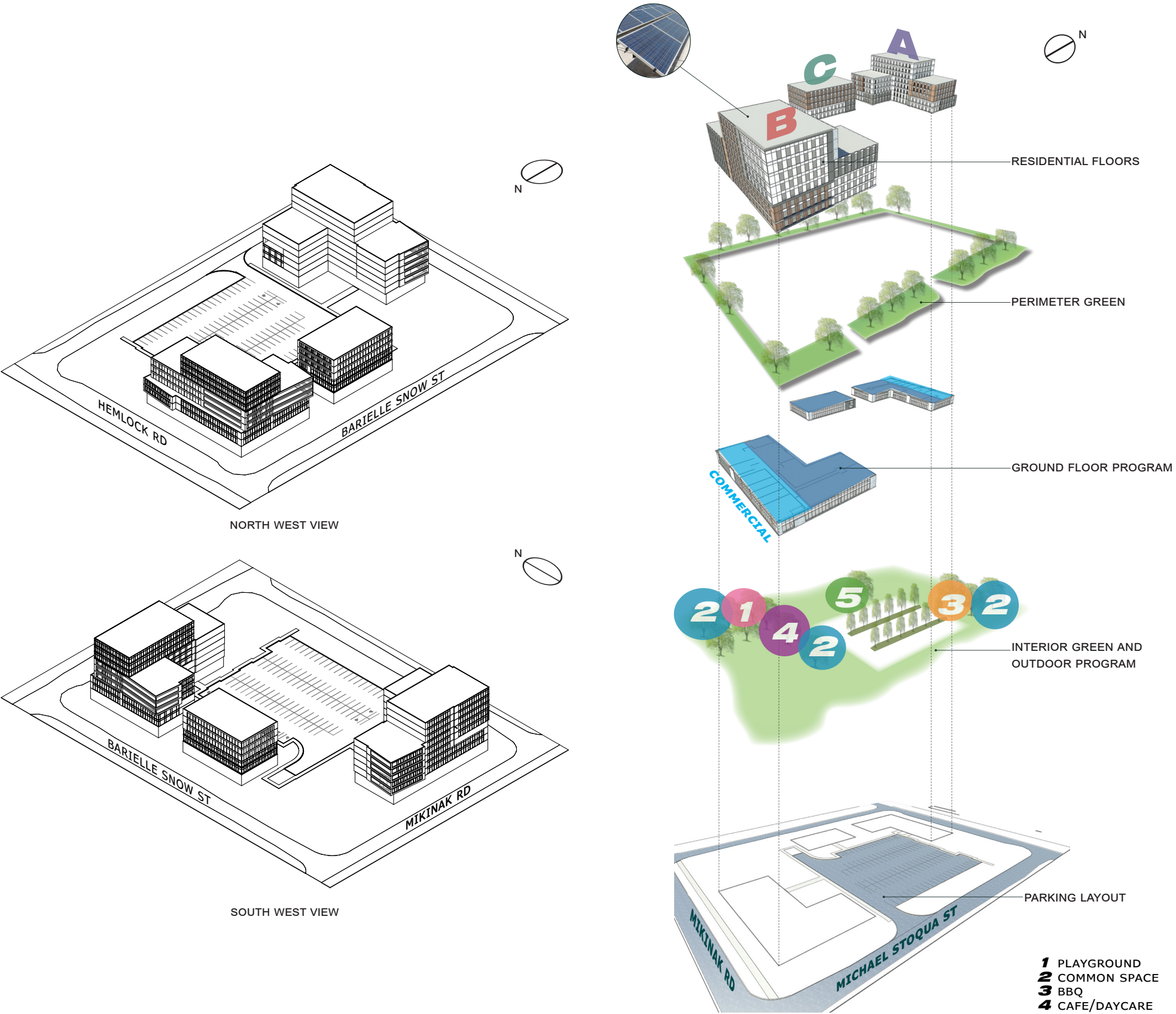
OPTION 3: URBAN GARDEN

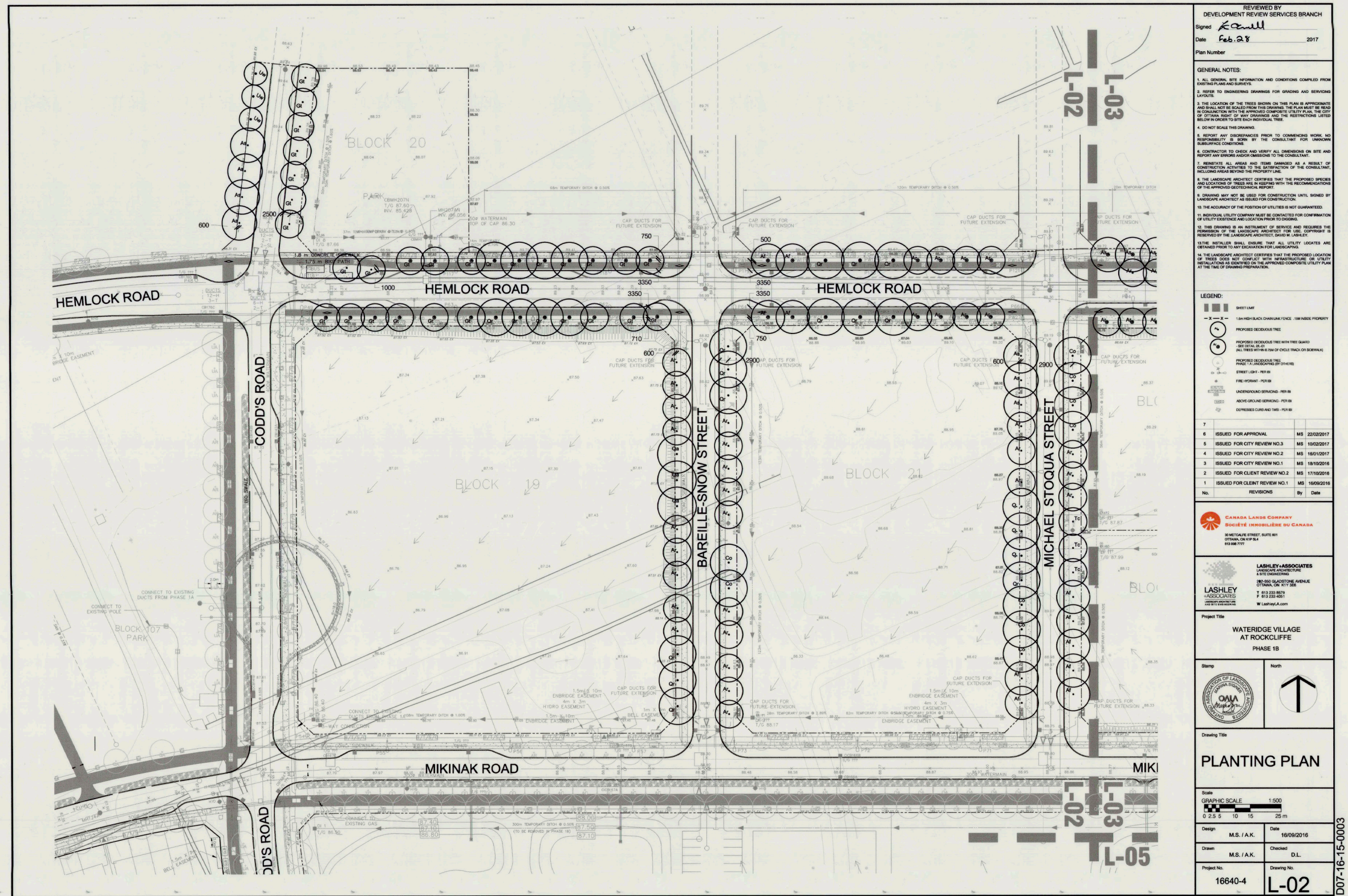
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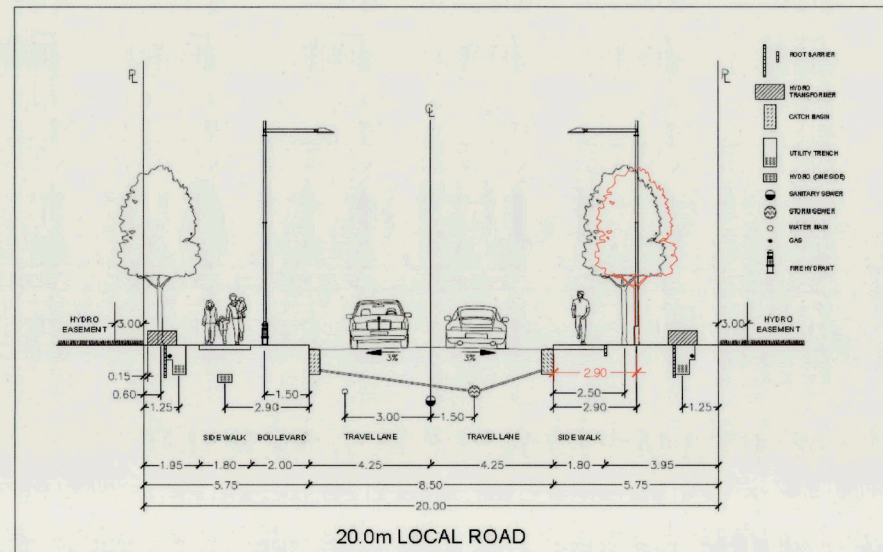
The triad of buildings are arranged to provide two-thirds length street frontage for the northwest corner at Hemlock Rd and its southeast corner at Mikinak Rd. Two corners of the block are framed by the massing of twin Buildings A and B. The northeast and southwest corners remain open thus creating two distinct open amenity spaces. The center quadrant of the west side of the block, along Barielle Snow St. is focused on Building C, with its modest rectangular 6-storey configuration. An outdoor roof-top amenity space can be considered on the lower roof at the eastern edge of Buildings A, providing views both to the river and the future park along Mikinak Rd., accessible to residents. Similarly, an outdoor roof-top amenity space can be considered on the lower roof at the western edge of Building B, providing views both to the surrounding environment and in particular, to the future park along Mikinak Rd., accessible to residents.

SITE ACCESS:

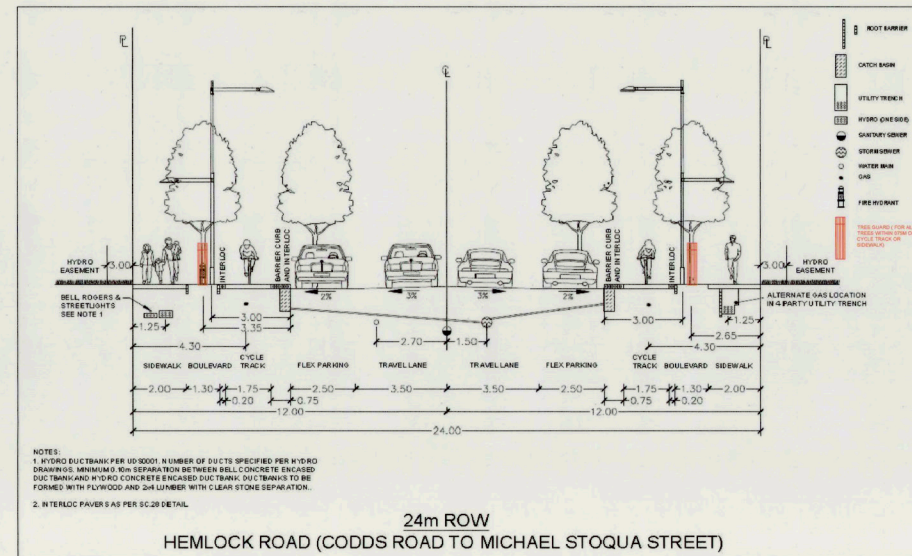
The east side of the site, along Michael Stoqua St. remains open to the surrounding urban con-text and is the primary site access. The centered parking lot provides easy access to all three buildings, with pedestrian access designed at the perimeter. Clear lines of sight from the north-east diagonally across to the southwest weaves the exterior into the interior of the block.



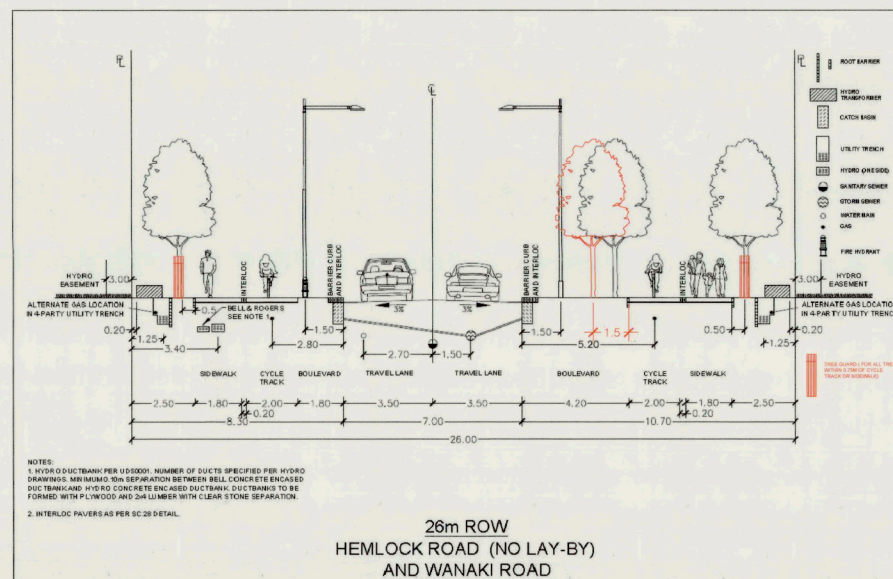




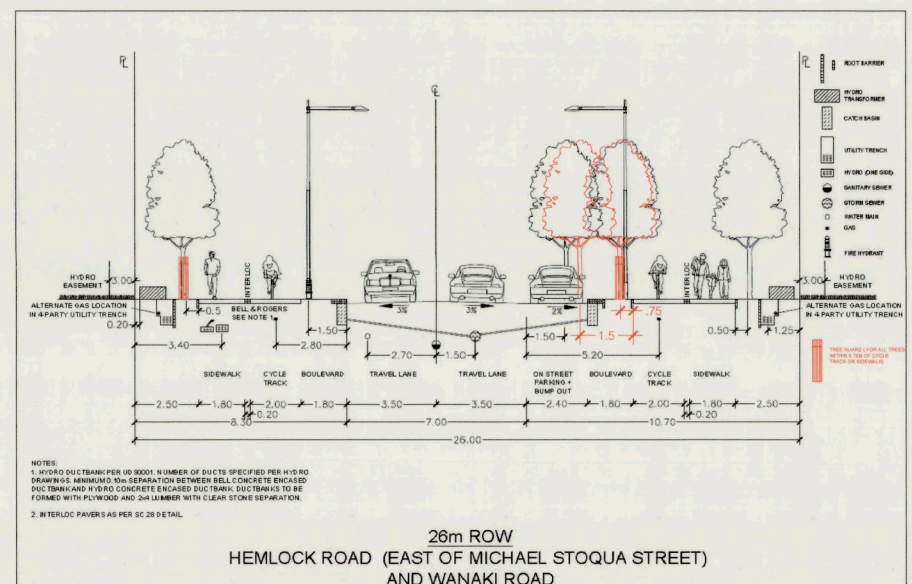
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Reviewed by DEVELOPMENT REVIEW SERVICES BRANCH Signed: <u><i>[Signature]</i></u> Date: <u>Feb. 28</u> Plan Number: _____ 2017			
GENERAL NOTES:			
1. ALL GENERAL SITE INFORMATION AND CONDITIONS COMPLIED FROM EXISTING PLANS AND SURVEYS			
2. REFER TO ENGINEERING DRAWINGS FOR GRADING AND SERVINGS DETAILS			
3. THE LOCATION OF THE TREES SHOWN ON THIS PLAN IS APPROXIMATE AND SHALL NOT BE SCALED FROM THE DRAWING. THE PLAN MUST BE READ IN CONJUNCTION WITH THE APPROVED COMPOSITE FLIGHT PLAN. THE CITY OF OTTAWA HAS MANY GRADING AND SERVING RESTRICTIONS LISTED BELOW IN ORDER TO SITE EACH INDIVIDUAL TREE.			
4. DO NOT SCALE THIS DRAWING.			
5. IDENTIFY ANY DISCREPANCIES BETWEEN THE COMPARISON WORK. UNREASONABLE DISCREPANCY IS BORNE BY THE CONSULTANT FOR UNREASONABLE DISCREPANCY.			
6. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ANY ERRORS AND ADJUSTMENTS TO THE CONSULTANT			
7. IDENTIFY ALL HAZARD AND ITEMS DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES TO THE SATISFACTION OF THE CONSULTANT INCLUDING AREAS BEHIND THE PROPERTY LINE			
8. THE LANDSCAPE ARCHITECT CERTIFIES THAT THE PROPOSED SPECIES AND LOCATIONS OF TREES ARE IN KEEPING WITH THE RECOMMENDATIONS OF THE APPROVED SECTED-LEGAL REPORT			
9. DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY LANDSCAPE ARCHITECT AND ISSUED FOR CONSTRUCTION			
10. THE ACCURACY OF THE POSITION OF UTILITIES IS NOT GUARANTEED			
11. INDIVIDUAL UTILITY COMPANY MUST BE CONTACTED FOR CONFIRMATION OF UTILITY EXISTENCE AND LOCATION PRIOR TO DESIGN			
12. THIS DRAWING IS AN INSTRUMENT OF SERVICE AND REQUIRES THE FURNISHING OF THIS DRAWING TO ANY EXAMINATION FOR LANDSCAPING			
13. THE INSTALLER SHALL ENSURE THAT ALL UTILITY LOCATIONS ARE OBTAINED PRIOR TO ANY EXAMINATION FOR LANDSCAPING			
14. THE LANDSCAPE ARCHITECT CERTIFIES THAT THE PROPOSED LOCATION OF TREES DOES NOT CONFLICT WITH INFRASTRUCTURE OR UTILITY REGULATIONS AS IDENTIFIED ON THE APPROVED COMPOSITE UTILITY PLAN AT THE TIME OF DRAWING REVISION			
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Relationship to the Public Realm



BUILDING A MIKINAK ROAD ENTRANCE



BUILDING B EXTERIOR VIEW – UNIT PATIOS



VIEW LOOKING WEST ALONG MIKINAK ROAD



COURTYARD VIEW LOOKING SOUTH



COURTYARD VIEW LOOKING NORTH

The conceptual genesis of the project always reflected the need to create a link between past and present. We apply conceptual restorative ideals to show gratitude to the land and to the Algonquins of Ontario for their stewardship of it.

In keeping up with the consistency of the design ideals, a prominent space located at the southern entry to the courtyard was selected. The space faces the new community park and the main boulevard, becoming a focal point and gateway to the entire site.

The proposed public art piece is a Restorative Circle wood sculpted bench, symbolizing the link between past and present using traditional mass timber construction with digital fabrication and design.

It is a place to reflect, read, gather, and inform, as well as restoring the land and our connection to the original Indigenous communities of the Ottawa Valley.



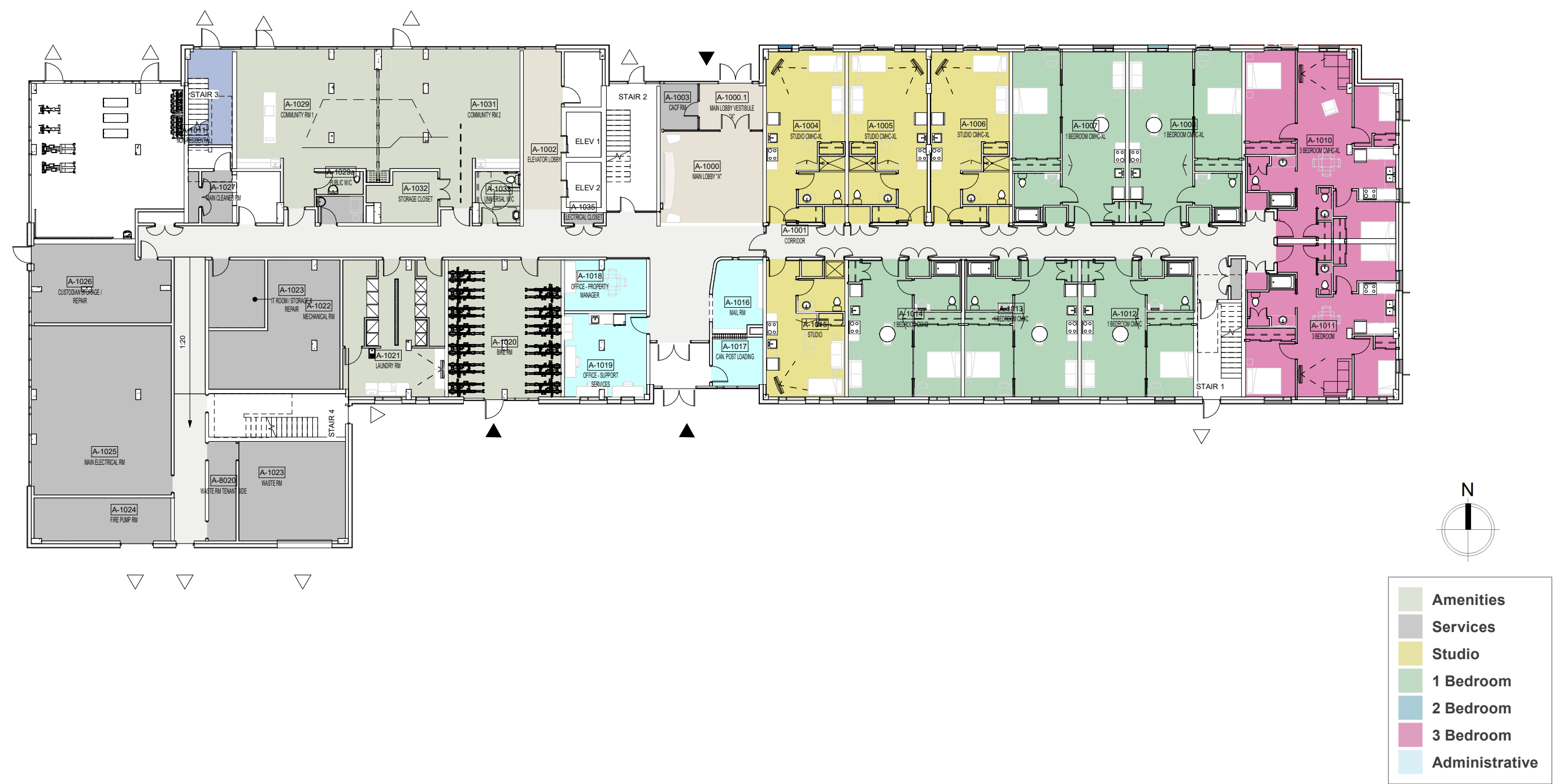
VIEW FROM MIKINAK ROAD LOOKING NORTH



RESTORATIVE CIRCLE PUBLIC ART BENCH LOCATED AT COURTYARD'S SOUTH ENTRY

Floor Plans

BUILDING A – FLOOR PLAN – LEVEL 1



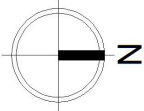
BUILDING A – FLOOR PLAN – TYPICAL



BUILDING B – FLOOR PLAN – LEVEL 1

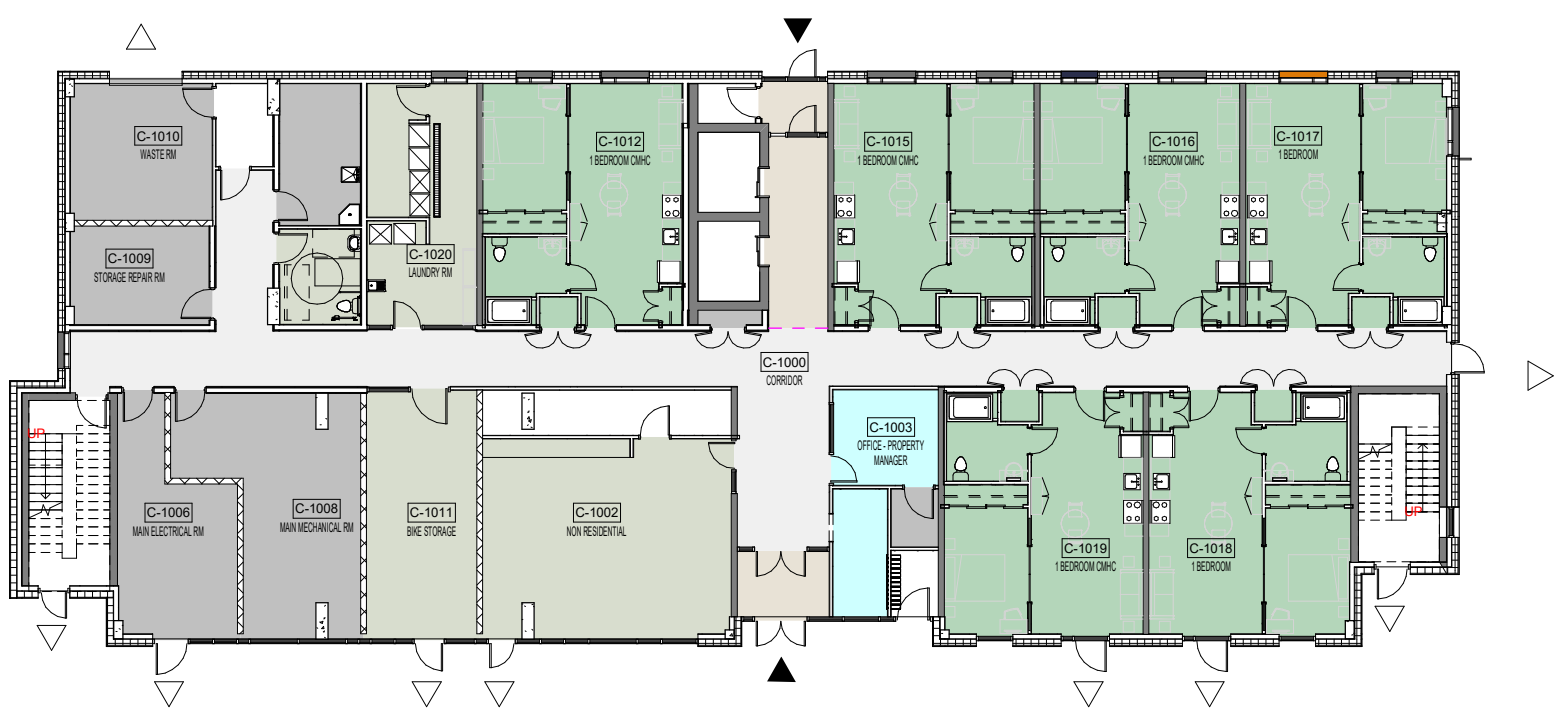


BUILDING B – FLOOR PLAN – TYPICAL

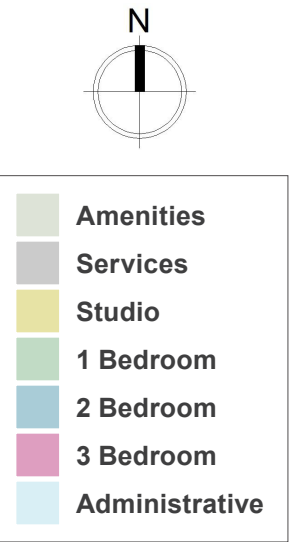
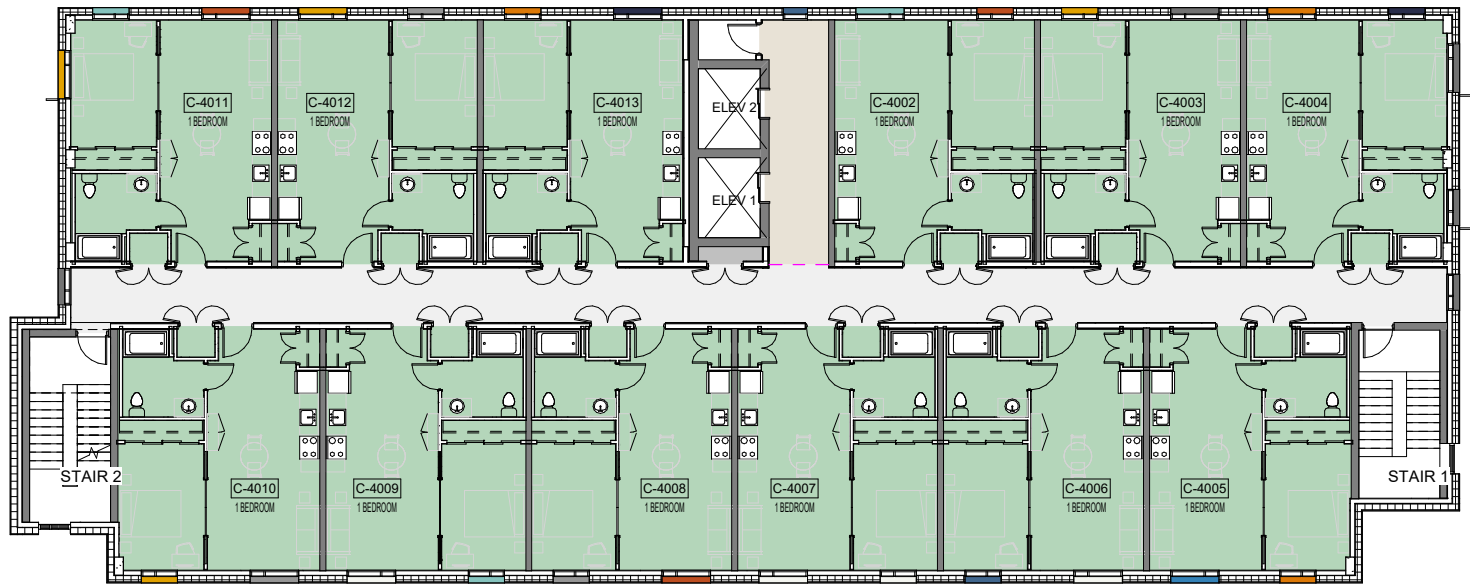


- Amenities
- Services
- Studio
- 1 Bedroom
- 2 Bedroom
- 3 Bedroom
- Administrative

BUILDING C – FLOOR PLAN – LEVEL 1

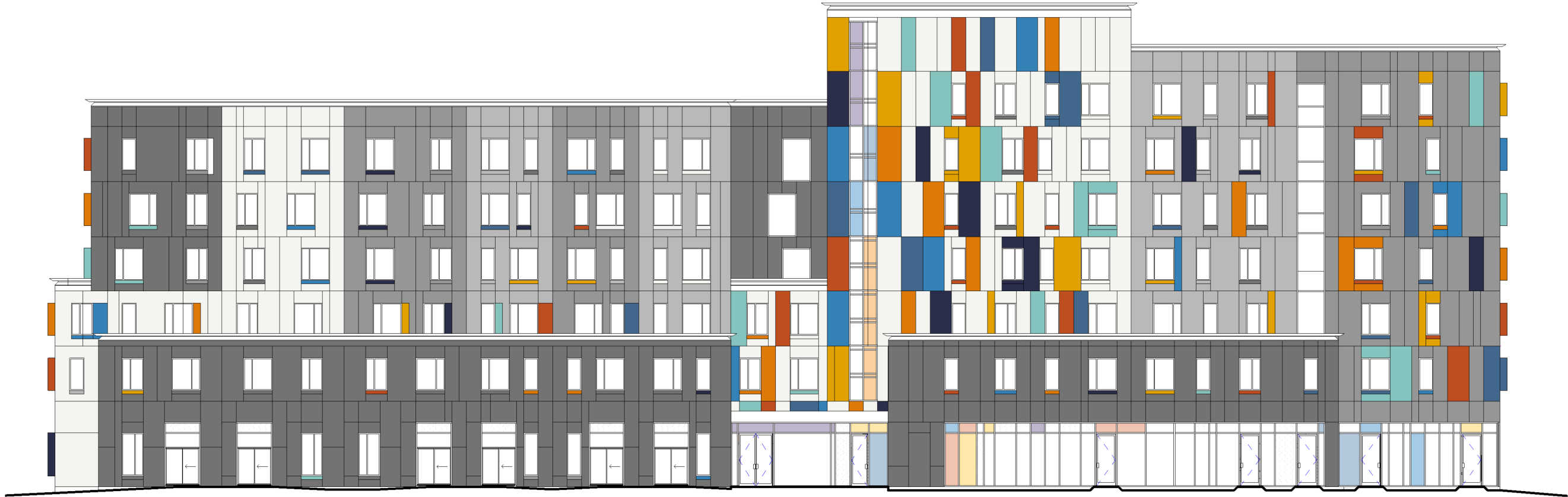


BUILDING C – FLOOR PLAN – TYPICAL



Elevations

BUILDING A – NORTH ELEVATION



BUILDING A – SOUTH ELEVATION



BUILDING A – EAST ELEVATION



BUILDING A – WEST ELEVATION



BUILDING B – WEST ELEVATION



BUILDING B – SOUTH ELEVATION



BUILDING B – NORTH ELEVATION



BUILDING B – EAST ELEVATION



BUILDING C – SOUTH ELEVATION



BUILDING C – EAST ELEVATION



BUILDING C – NORTH ELEVATION



BUILDING C – WEST ELEVATION



Sustainability Design Features

SUSTAINABILITY APPROACH AND HIGH LEVEL PRINCIPLES

A world class sustainability and energy standard is being achieved through diligent planning and clear and specific goals, including the requirement to meet the performance levels of the Passive House building standard. Morrison Hershfield is leading the team towards achieving the required sustainability requirements.

As the project is not certifying to any sustainability standard, there is potential risk of understanding and achieving the owner's sustainability goals. Our approach to this challenge is or rely on Morrison Hershfield's Green Verification services. Green Verification services are based on the principles of commissioning, but with a focus on sustainability issues rather than M&E systems. It is a quality assurance process offering a holistic and systematic approach to assist the Owner and project team in identifying and tracking sustainability goals from project conception to completion.



The Green Verification process begins with a definition of the high level owner goals related to sustainability. These were achieved earlier in the project, and are presented in Appendix A. As the project progressed, detailed and measurable requirements are developed to translate these high level goals into measurable outcomes, called Owner's Sustainability Requirements (OSRs).

Through the design and construction process, Morrison Hershfield will act as the Sustainability Authority, attending design and construction meetings, reviewing drawings and specifications, and gathering the evidence that the OSR measures are met. Morrison Hershfield will also champion sustainability issues through the lens of the OSRs. At project completion, a comprehensive report is provided that includes the OSRs and evidence that each of the OSR was met.

OWNER’S SUSTAINABILITY REQUIREMENTS

The process has begun with the drafting of the project goals related to sustainability, captured in the Owner's Sustainability Requirements (OSR's). This is a critical tool and forms the basis on which future decisions related to sustainability are made. The OSR's relate to social, environmental and economic impacts, considering things beyond energy efficiency, such as comfort, durability, air quality, social fairness and equality, ecology, climate change, water efficiency, and more. Note also that the OSR's are not fixed: they can be changed by the owner at any time. Capital and operating costs are also part of the equation, meaning there is an intent to achieve the building within the owner's budget constraints. OSRs are first limited to high level conceptual goals and are then translated in specific measurable goals. Note that for the Mikinak project, the Passive House and Energy Efficiency goals are included within the OSRs, such that the OSR should represent the complete list of Owner's requirements related to sustainability.

The OSRs were drafted by the design team and vetted by the owner, and Morrison Hershfield are now in the process of ensuring that all OSR requirements are measurable and communicating these requirements to the appropriate stakeholder. These measures represent the proof that the requirement has been met, and can be very simple, such as a photograph of a finished product, or complex, such as comprehensive engineering calculations. Once again, the owner vets these measures, so they can reflect the owner's need for appropriate levels of verification.

It is important to emphasize that these OSRs are flexible and can be changed by the owner at any time in the process. As such, they are presented as draft OSRs, and will remain in draft format until the owner and team are comfortable that they fully represent the owner requirements. The OSRs have been modified by the owner in consultation with the design team since schematic design.

The current Draft OSR table is provided in Appendix B. Abandoned OSRs remain in the table but are crossed out and highlighted in grey.

HIGH LEVEL SUSTAINABILITY PRINCIPLES

Principle #	OPSR	Measure	Focus (0-5)
P1	PASSIVE approach to sustainability	low cost and low amounts of control. Typically give up comfort and control of indoors. Examples are operable windows, exposed structure.	4
P2	ACTIVE approach to sustainability	higher cost and high technology. Typically includes automation and technology, leading edge systems and requires continued maintenance.	3
P3	Carbon Reduction	natural gas use reduction, measuring by CO2 (not BTU or \$)	4
P4	Energy Cost Reduction	Focus on life cycle COST of energy, net present Value	5
P5	Transportation Impacts	Bike racks, mass transit, electric vehicles, less parking	3
P6	Material Impacts	Materials with low carbon footprint, Environmental product declarations (EPDs), recycled or local materials	2
P7	Water Impacts	efficient fixtures, site water management, green roofs, storm water ponds, storm water cisterns, storm ceptors	3
P8	Health and Wellness	natural light, low VOC materials, higher filtration, exceptional air distribution, acoustics, fitness, sound	4
P9	Durability and Resiliency	Robust building envelope, exposed concrete floors, climate change resiliency, passive design concepts	5
P10	Flora and Fauna / Ecology	green roofs, living walls, bird friendly design, site restoration, light pollution, native species	2
P11	Fairness and Equality / Social	encourage visible minorities / indigenous / women, accessibility, fair trade, good neighbor, public use, education, community gardens	5
P12	Leadership	visibility, marketing, teaching and demonstrating, LEED, wood, linoleum, innovation	3
P13	Waste	construction waste reduction, operating waste reduction, deconstructability	4

Passive House Principles

PHIUS+ ENERGY MODELLING

MEMORANDUM



TO: Alice Tchakedjian, OAA, OAQ, Architect
IBI Group
Suite 400 – 333 Preston Street
Ottawa, ON K1S 5N4

FROM: Wes Burkard, P. Eng

PROJECT No.: 200195401

DATE: 19-MAY-2021

RE: Mikinak Redevelopment
Pre-CD WUFI Passive Energy Model

X:\PROJ\2020\200195401-OCH - SUSTAINABILITY MIKINAK\08. WORKING\PASSIVE HOUSE\03 PRE-CD\MIKINAK REDEVELOPMENT - PRE-CD - WUFI PASSIVE ENERGY MODEL RESULTS - 19-MAY-2021.DOCX

Morrison Hershfield (MH) has completed a preliminary energy analysis for buildings A, B, and C of the Mikinak Redevelopment Project in accordance with the recommendations and requirements established by the Passive House Institute United States (PHIUS). This involved the development of a three-dimensional model of each building and the relevant site shading elements that were imported into Fraunhofer IBP’s WUFI Passive software (Version 3.2.0.1).

A review of the energy analysis was conducted by Prudence Ferreira of BR+A Consulting Engineers.

Based on the inputs described below, the results of the energy analysis and their standing relative to the space conditioning criteria established by PHIUS are as follows:

Building	Criteria	PHIUS Target	Pre-CD Phase, Mikinak Redevelopment
A	Annual Heating Demand (kWh/(m ² yr))	≤ 14.8	5.4
	Annual Cooling Demand (kWh/(m ² yr))	≤ 17.4	7.4
	Peak Heating Load (W/m ²)	≤ 15.3	9.3
	Peak Cooling Load (W/m ²)	≤ 7.3	4.6
	Primary Energy Demand (kWh/year/person)	≤ 6200	2,658
B	Annual Heating Demand (kWh/(m ² yr))	≤ 14.7	6.4
	Annual Cooling Demand (kWh/(m ² yr))	≤ 17.8	10.3
	Peak Heating Load (W/m ²)	≤ 15.1	9.6
	Peak Cooling Load (W/m ²)	≤ 7.3	5.8
	Primary Energy Demand (kWh/year/person)	≤ 6200	2,828
C	Annual Heating Demand (kWh/(m ² yr))	≤ 15.5	8.8
	Annual Cooling Demand (kWh/(m ² yr))	≤ 12.9	7.4
	Peak Heating Load (W/m ²)	≤ 15.1	11.2
	Peak Cooling Load (W/m ²)	≤ 6.0	4.9
	Primary Energy Demand (kWh/year/person)	≤ 6200	3,009



DISCUSSION

Model

The three-dimensional modelling was completed using Trimble’s SketchUp Pro software and was based on the information presented in the “Pre-CD” architectural drawing package provided to MH by IBI Group on 25-MAR-2021. Refer to Appendix A for images of the SketchUp model. It is MH’s understanding that some relatively minor changes to the building’s geometry have occurred since receiving the “Pre-CD” package, but these changes are not anticipated to have a substantial impact on the building’s energy performance and will be incorporated into the energy analysis during the next iteration.

Shading

The shading strategy implemented is comprised of:

- Horizontal sun shades mounted above the windows on the southern elevations
- Vertical sun shades mounted on the southern sides of the windows on the western and eastern elevations
- Canopies above the ground-level entrances
- Vegetation providing shading to some ground-level glazing

Climate

The energy analysis was completed utilizing monthly climate data sourced from PHIUS, adjusted for the elevation differential between the development site, 715 Mikinak Road, and the climate file source location.

Energy Analysis Input Basis

The Parametric Energy Modeling Report – Mikinak: Buildings A & B, prepared by MH, dated 06-DEC-2020 was utilized as the basis for this PHIUS energy analysis. More specifically, the MH Parametric Energy Modeling Report lists the following variables as being optimal for the Mikinak Redevelopment Project:

- Roof effective thermal resistance ($hr\ ft^2\ ^\circ F)/(BTU)$: R-60
- Wall effective thermal resistance ($hr\ ft^2\ ^\circ F)/(BTU)$: R-35
- Window overall heat transfer coefficient for fenestration ($W/(m^2\ K)$): 1.25
- Glazing solar heat gain coefficient (SHGC): 0.4

Note: The electrical loads of the development were calculated utilizing PHIUS protocols, which differs from the methodology utilized in the MH Parametric Energy Modeling Report. Further, said report utilized a horizontal and vertical sun shade depth of 600mm while a depth of 400mm was used in the PHIUS energy analysis based on the dimensioning measured in the Pre-CD architectural package.

Energy Analysis Variables

Regarding this PHIUS energy analysis, the above input basis benchmarks translated into the following:

- Roof assembly:
 - R-61 ($hr\ ft^2\ ^\circ F)/(BTU)$
 - Modeled as 10” of polyisocyanurate insulation atop a concrete deck
- Opaque wall assembly (clearwall):
 - R-38 ($hr\ ft^2\ ^\circ F)/(BTU)$
 - Assumed a clearwall assembly similar to Detail 5.1.100 from the Building Envelope Thermal Bridging Guide (16” horizontal clip spacing, 24” vertical clip spacing assumed; refer to Appendix A)
 - Accounts for repeating thermal bridges such as steel studs and cladding clip systems
- Slab-on-grade assembly:
 - R-21 ($hr\ ft^2\ ^\circ F)/(BTU)$
 - Modeled as 5” of extruded polystyrene (XPS) insulation beneath a concrete slab
 - Sub-slab insulation was not mentioned in the Parametric Energy Modeling Report and was an assumption in this analysis
- Windows, curtain walls, glass swing doors, and glass sliding doors:
 - $U_w = 0.98\ (W/(m^2\ K))$
 - SHGC = 0.31
 - Installation linear thermal transmission losses ($\Psi_{install}$) were quantified according to the PHIUS-recommended default values (equivalent to a mid-mounted window or over-insulated frames); these values are placeholders that will be updated once the pertinent detail drawings are developed
- Opaque doors (utility and overhead):
 - $U_w = 1.04\ (W/(m^2\ K))$
 - Insulated, steel construction
- Thermal bridges:
 - Thermal bridging throughout the building enclosure were estimated using the dimensions in the aforementioned architectural drawing package and transmission rates from similar projects and standardized, ‘high-performance’ values; these values are placeholders that will be updated once the pertinent detail drawings are developed
 - Details analyzed include:
 - Exterior-wall-to-slab-on-grade junctions
 - Slab-on-grade with a door or window sill above
 - Floor bypasses (intermediate floors)
 - Parapets



- Outside corners (vertical and horizontal)
 - Inside corners (vertical and horizontal)
 - Sun shade clip attachments
 - Opaque door perimeters
 - HVAC system building enclosure penetrations
- Air infiltration:
 - Air infiltration/exfiltration was quantified for each building as per PHIUS protocols utilizing as conservative value as is allowable
 - Air leakage allotments were made for egress/panic hardware
- Electrical loads:
 - The occupancy was calculated as per PHIUS protocols and was determined to be 619
 - The electrical loads were calculated as per PHIUS protocols and consist of items such as:
 - Washing machines – energy use a function of the number of occupants
 - Dryers:
 - Heat pump (condensation) dryers in each two- and three-bedroom unit – energy use a function of the number of occupants (353)
 - Natural gas, exhausted air dryers in each communal laundry room – energy use a function of the number of occupants (266)
 - Refrigerator/freezer combo – energy use a function of the number of units
 - Electric cooktops – energy use a function of the number of occupants
 - Miscellaneous electric loads (plug loads) – energy use a function of space types and quantities
 - Interior and exterior lighting – LED lighting assumed
 - Elevator loads – energy use calculated using the ThyssenKrupp calculator as directed by PHIUS
- Ventilation and space heating:
 - Minotair PentaCare-V12 units with 5kW post-heaters equipped for each unit; the ductwork connecting each unit to the exterior were assumed to be insulated
 - Ventilation rates modeled as per PHIUS recommended values; will be updated to align with the mechanical design once the pertinent information is finalized and available
 - As of 04-MAY-2021, mini-make-up-air units (mini-MUA) utilizing variable refrigerant flow (VRF) systems are anticipated to be used to condition and ventilate the corridor and common (assumed; may be a DOAS as per a previous mechanical report) spaces as per the project's Mechanical Engineering Consultant: Goodkey, Weedmark, and Associates Limited (GWAL); this system was still in design at the time of this energy analysis and therefore is not incorporated in these results. The work that will be completed by this system once implemented was approximated using the performance metrics of the Minotair PentaCare-V12 system for this analysis and will be updated during a later energy analysis iteration once MH is provided sufficient information on the system to be installed.

- Domestic hot water (DHW):
 - Provided by the Sharc Piranha T15 (x2, Building A, B) and T5 (Building C)
 - The Sharc Piranha incorporates drain water heat recovery, which was assumed to be 45% efficient for this analysis
 - Alternate systems, such as supplementary heat pumps or back-up natural gas boilers may be designed into the DHW system but were not incorporated in this iteration of the energy analysis as this information was not available to MH
 - A hot water recirculation loop was assumed to run from the mechanical room up through the center of each building
- Photovoltaic system:
 - Included as per the iSolara Solar Power design brief dated 04-DEC-2020

Glazing

As a basis of design, this iteration of the energy analysis utilizes the Inline Fiberglass Ltd. frames selected for the 811 Gladstone Ontario Community Housing (OCH) project. IBI Group has provided MH with several insulated glass units (IGU) from Vitro Architectural Glass for consideration. The results stated above are the result of a high-grade (thermally) IGU ($U_{\text{glass}} = 0.68 \text{ W/m}^2\text{K}$, SHGC = 0.31) for all the glazing throughout the project. The thermal performance of this glazing is similar to that specified in the 811 Gladstone Project.

The intent is to analyze the impact of varying IGU performance criteria on specific elevations and levels in the next stage of design to optimize the glazing's impact on both heating and cooling loads in the Ottawa climate.

RESULTS

This energy analysis incorporates numerous components typical of 'high-performance' buildings, such as opaque and glazed assemblies with high thermal resistivities, minimal thermal bridging throughout, sub-slab insulation, exterior shading, drain water heat recovery, heat-pump-based DHW and space heating systems, and on-site photovoltaics, to name a few. The results of the energy analysis for each building reflects this, predicting three buildings falling well below their maximum PHIUS space conditioning criteria targets.

However, these favourable, low space conditioning criteria are anticipated to increase as the project progresses. Cost, constructability, and value will play a role and various cases based on this energy analysis may be assessed to determine the impact of reducing the exterior insulation thickness, or removing the over-insulation detail of the window frames, as examples. Assumptions made in this analysis as result of in-progress DHW system design, for example, will be updated as design decisions are made and the models will begin to more accurately reflect how each building will perform once constructed.



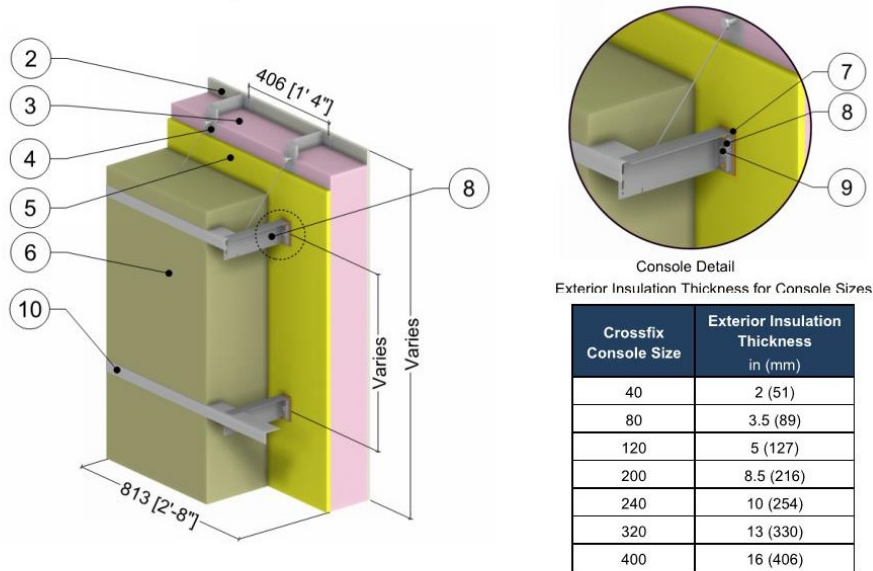
RECOMMENDATIONS

The energy analysis variables described above present a pathway to PHIUS compliance based on the building form factors and site layout described in the Pre-CD architectural drawing package. Barring any major changes to the noted design inputs that will have a significant impact on the building's space conditioning criteria or the primary energy demand, building's A, B, and C appear to be in line to meet PHIUS+ criteria.

It is recommended that major components of the energy analysis, such as the building envelope assemblies and window specifications, be prioritized in the early portion of the Construction Documents phase to provide a level of cost-certainty to the project as well as a basis to tweak the other energy analysis inputs to improve the value and performance of each building.

Detail 5.1.100

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with EJOT Crossfix Console and Horizontal Rail System Supporting Metal Cladding and R-20 Batt Insulation in Stud Cavity - Clear Wall



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft²·hr·°F (W/m K)	Nominal Resistance hr·ft²·°F/Btu (m²K/W)	Density lb/ft³ (kg/m³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	6" (152)	0.30 (0.043)	R-20 (3.5 RSI)	0.55 (8.8)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-8.4 to R-67.2 (1.48 to 11.84 RSI)	4 (64)	0.20 (850)
7	Thermostop	0.2" (5)	2.2 (0.32)	-	69 (1100)	0.36 (1500)
8	EJOT Console and Components	0.06" (1.5)	112 (16)	-	499 (8000)	0.12 (500)
9	Fastener	0.22" (5.5) Ø	112 (16)	-	499 (8000)	0.12 (500)
10	Rail	0.08" (2)	1110 (160)	-	-	-
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film¹	-	-	R-0.7 (0.12 RSI)	-	-

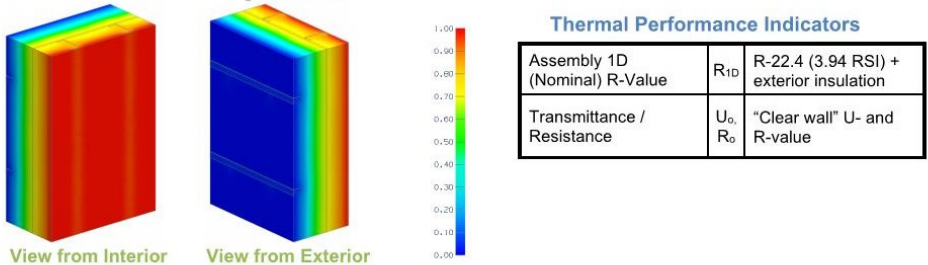
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Material Datasheet of Assumed Opaque Wall Assembly Modeled



Detail 5.1.100

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with EJOT Crossfix Console and Horizontal Rail System Supporting Metal Cladding and R-20 Batt Insulation in Stud Cavity - Clear Wall



Nominal (1D) vs. Assembly Performance Indicators

16" Horizontal Console Spacing								
Exterior Insulation 1D R-Value (RSI)	R _{1D} ft²·hr·°F / Btu (m² K / W)	24" Vertical Clip Spacing R _o ft²·hr·°F / Btu (m² K / W)	U _o Btu/ft²·hr·°F (W/m² K)	36" Vertical Clip Spacing R _o ft²·hr·°F / Btu (m² K / W)	U _o Btu/ft²·hr·°F (W/m² K)	48" Vertical Clip Spacing R _o ft²·hr·°F / Btu (m² K / W)	U _o Btu/ft²·hr·°F (W/m² K)	
R-8.4 (1.48)	R-30.8 (5.42)	R-18.6 (3.27)	0.054 (0.31)	R-19.2 (3.39)	0.052 (0.30)	R-19.6 (3.45)	0.051 (0.29)	
R-12.6 (2.22)	R-35.0 (6.16)	R-21.8 (3.85)	0.046 (0.26)	R-22.8 (4.01)	0.044 (0.25)	R-23.3 (4.10)	0.044 (0.25)	
R-14.7 (2.59)	R-37.1 (6.53)	R-23.5 (4.14)	0.043 (0.24)	R-24.6 (4.33)	0.041 (0.23)	R-25.2 (4.43)	0.040 (0.23)	
R-21.0 (3.70)	R-43.4 (7.64)	R-28.3 (4.98)	0.035 (0.20)	R-29.8 (5.24)	0.034 (0.19)	R-30.6 (5.39)	0.033 (0.19)	
R-27.3 (4.81)	R-49.7 (8.75)	R-33.1 (5.83)	0.031 (0.18)	R-35.0 (6.17)	0.029 (0.17)	R-36.1 (6.35)	0.029 (0.16)	
R-35.7 (6.29)	R-58.1 (10.23)	R-39.5 (6.96)	0.025 (0.14)	R-42.0 (7.40)	0.024 (0.14)	R-43.4 (7.64)	0.023 (0.13)	
R-42.0 (7.40)	R-64.4 (11.34)	R-44.1 (7.77)	0.023 (0.13)	R-47.0 (8.29)	0.021 (0.12)	R-48.7 (8.58)	0.021 (0.12)	
R-48.3 (8.51)	R-70.7 (12.45)	R-48.7 (8.58)	0.021 (0.12)	R-52.1 (9.18)	0.019 (0.11)	R-54.0 (9.51)	0.019 (0.11)	
R-54.6 (9.62)	R-77.0 (13.56)	R-53.3 (9.39)	0.019 (0.11)	R-57.2 (10.07)	0.017 (0.10)	R-59.4 (10.45)	0.017 (0.10)	
R-60.9 (10.73)	R-83.3 (14.67)	R-57.9 (10.20)	0.017 (0.10)	R-62.2 (10.96)	0.016 (0.09)	R-64.7 (11.39)	0.016 (0.09)	
R-67.2 (11.84)	R-89.6 (15.78)	R-62.5 (11.01)	0.016 (0.09)	R-67.3 (11.85)	0.015 (0.08)	R-70.0 (12.33)	0.014 (0.08)	

32" Horizontal Console Spacing								
Exterior Insulation 1D R-Value (RSI)	R _{1D} ft²·hr·°F / Btu (m² K / W)	24" Vertical Clip Spacing R _o ft²·hr·°F / Btu (m² K / W)	U _o Btu/ft²·hr·°F (W/m² K)	36" Vertical Clip Spacing R _o ft²·hr·°F / Btu (m² K / W)	U _o Btu/ft²·hr·°F (W/m² K)	48" Vertical Clip Spacing R _o ft²·hr·°F / Btu (m² K / W)	U _o Btu/ft²·hr·°F (W/m² K)	
R-8.4 (1.48)	R-30.8 (5.42)	R-19.4 (3.41)	0.052 (0.29)	R-19.8 (3.49)	0.051 (0.29)	R-20.0 (3.53)	0.050 (0.28)	
R-12.6 (2.22)	R-35.0 (6.16)	R-22.9 (4.03)	0.044 (0.25)	R-23.5 (4.14)	0.043 (0.24)	R-23.9 (4.21)	0.042 (0.24)	
R-14.7 (2.59)	R-37.1 (6.53)	R-24.7 (4.34)	0.041 (0.23)	R-25.4 (4.47)	0.039 (0.22)	R-25.8 (4.55)	0.039 (0.22)	
R-21.0 (3.70)	R-43.4 (7.64)	R-30.1 (5.31)	0.033 (0.19)	R-31.1 (5.49)	0.032 (0.18)	R-31.7 (5.58)	0.032 (0.18)	
R-27.3 (4.81)	R-49.7 (8.75)	R-35.6 (6.27)	0.029 (0.16)	R-36.9 (6.49)	0.028 (0.16)	R-37.6 (6.61)	0.027 (0.16)	
R-35.7 (6.29)	R-58.1 (10.23)	R-42.9 (7.56)	0.023 (0.13)	R-44.5 (7.84)	0.022 (0.13)	R-45.4 (7.99)	0.022 (0.13)	
R-42.0 (7.40)	R-64.4 (11.34)	R-48.3 (8.50)	0.021 (0.12)	R-50.1 (8.83)	0.020 (0.11)	R-51.1 (9.01)	0.020 (0.11)	
R-48.3 (8.51)	R-70.7 (12.45)	R-53.6 (9.44)	0.019 (0.11)	R-55.8 (9.82)	0.018 (0.10)	R-56.9 (10.02)	0.018 (0.10)	
R-54.6 (9.62)	R-77.0 (13.56)	R-58.9 (10.38)	0.017 (0.10)	R-61.4 (10.81)	0.016 (0.09)	R-62.7 (11.04)	0.016 (0.09)	
R-60.9 (10.73)	R-83.3 (14.67)	R-64.2 (11.31)	0.016 (0.09)	R-67.0 (11.80)	0.015 (0.09)	R-68.5 (12.06)	0.015 (0.08)	
R-67.2 (11.84)	R-89.6 (15.78)	R-69.6 (12.25)	0.014 (0.08)	R-72.6 (12.79)	0.014 (0.08)	R-74.2 (13.07)	0.013 (0.08)	

Thermal Datasheet of Assumed Opaque Wall Assembly Modeled



Energy Production

SYSTEM SUMMARY

The proposed rooftop PV solar arrays / DG net-metering systems are as follows:

- Building A – 120kW (AC)(~5 PV inverters) / ~135kW (DC)(~308 PV modules) (~125.5 MWh yield)
- Building B – 120kW (AC)(~5 PV inverters) / ~133kW (DC)(~303 PV modules) (~119.5 MWh yield)
- Building C – 60kW (AC)(~3 PV inverters) / ~61kW (DC)(~138 PV modules) (~54.8 MWh yield)

Tentative kW-AC size: The three building systems have tentatively been designed as 120kW, 120kW and 60kW (AC) (for purpose of design development & CIA submission to Hydro Ottawa Ltd.). These sizes are intentionally slightly larger than necessary for typical DC/AC overbuild considerations, so that if the PV module wattages increase between the present time and the actual implementation of the systems, the sizes will be ready to accommodate greater kW-DC capacity. The intentional slight increase in kW-AC size has been done such that other system components & ratings do not require significant changes if a lower AC capacity is installed, and no major upgrades are required to attain the full-rated kW-AC sizes.

The intent of the solar system is to produce electricity to offset the electrical energy usage on site. The approximate estimated yield of the 3 systems, given the current anticipated design is **300MWh** (all 3 buildings combined).

PRELIMINARY SITE LAYOUT



- Mikinak Rd
Ottawa, ON K1K
- System Size: 329.56 kW DC
 - First Year Production: ~300 MWh

Type	Manufacturer	Model	Quantity
Module	Canadian Solar Inc.	CS3W-440MS (1000V)	749
Inverter	Fronius International GmbH	24.0-3 (480V)	10
Inverter	Fronius International GmbH	20.0-3 (480V)	3

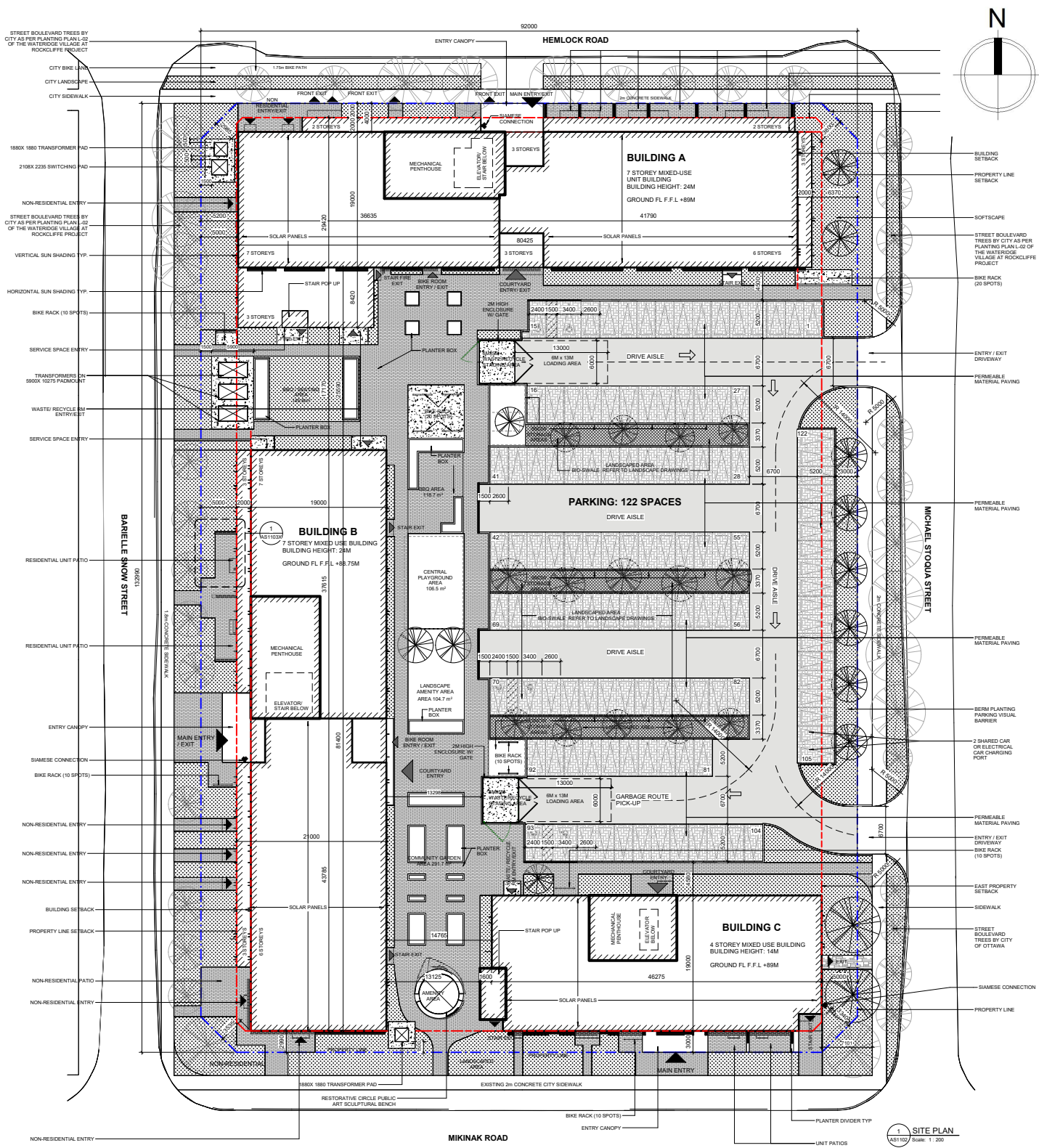
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Additional Requirements

Site Plan

The triad of buildings are arranged to provide full-length "active street frontage" for the north lot line along Hemlock Road and most of south lot line along Mikinak Road. Both north and west sides of the site are framed by the massing of sister towers from Building A and Building B. Building A extends the long arm of its "L" shaped configuration along the main road (Hemlock Road) together with Building B with its straight blocks along Barielle Snow Street shelter the entire site. They fully block the northwest wind and create a micro-climate for the courtyard. The east side of the site, along Michael Stoqua St., remains open to the surrounding urban context.

Considering the maximum building height controlled by Secondary Plan going down from the blocks at the northwest to the blocks at the east of this site, the tallest two towers with 7 storeys are located at the northwest corner of the site, which is the west tower of Building A and the north tower of Building B. It allows the over all building height on this site to decrease from northwest to southeast, which matches the direction that the Secondary Plan regulates. An outdoor roof-top amenity space can be considered in the open spaces between the towers of Building A, providing views to the river that is accessible to the residents. The multiple outdoor amenity space are provided to meet different functionality. The outdoor space located at the southwest corner between Buildings B and C provides a connection between the inner courtyard and the public urban street activities and South Community Park across Mikinak Road. The entire courtyard also functions as a green belt, extending the precious natural environment from north to south into the main road. Commercial activities are accessible from the public realm and connected to the main lobbies of Buildings A, B, and C.



Landscape Plan

INCEPTION

The foundation of this development is to create a space for healthy people, buildings, and ecology to work together for a healthy community. The site's layout creates a unique opportunity to achieve all the previously mentioned qualities within the landscaped open space.

The main barbecue and trellis seating areas are located directly beside buildings A and B, sheltering the area from cold winter winds while allowing for morning sun exposure. A designated barbecue and/or dining area is provided with ample seating and congregating opportunity, including communal tables. The centralized area includes an open lawn space, a centralized playground for children aged 2-12, and an outdoor seating/gathering area which serves as the heart of the block. It provides direct access for pedestrians, vehicles, and view corridors from all buildings.

Community gardens are proposed in the southern area between buildings B and C, allowing ease of accessibility for the residents of Building C. These community gardens offer an opportunity for residents to come together and connect with their food, the landscape, and each other.

Parking is located along the east of the site with main access from Michael Stouqua Street. Permeable paving is being explored within parking stalls to assist with reduction of urban heat island and drainage permeability. Bioswales are proposed throughout the parking aisles and along the perimeter of the site, which will offer additional ecological and aesthetic qualities to help minimize civil infrastructure.

Along Barielle Snow Street, barrier free units are provided with direct access to the street. Patios are designed with privacy screens and planters for personal use between each unit. This design provides an animated feel at grade, which provides the neighbourhood with a dynamic and vibrant living experience.

FUNCTIONAL USES

The outdoor amenity spaces include BBQ areas, junior playground, an urban farm, two meeting/sitting area located at the north and south of the site, and two open passive softscape areas.

Building's A & B have a directly adjacent BBQ area, located along the north end of the site. Between the buildings, a meeting /sitting area with passive softscape next to the Barielle Snow Street frontage and passive softscape area to allow for a more expansive surface area. Moving south down the site, a secondary passive softscape area separates the BBQ areas from the junior playground. A playground structure for children aged 2-5 accompanies a swingset and seating within a fence-enclosed area and an urban farm area for residents to use for urban agricultural practices.

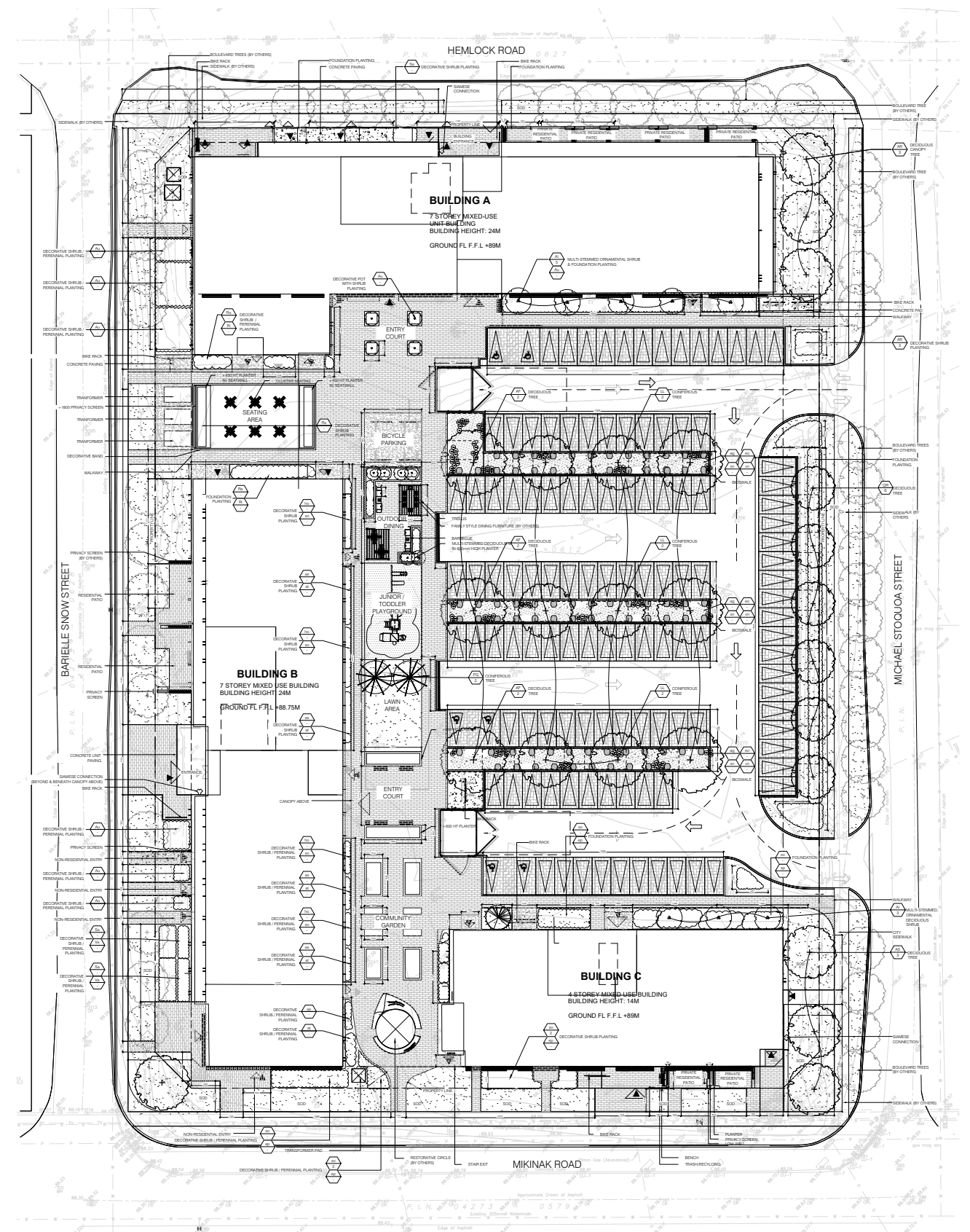
The southern most portion of the north-south green linkage features robust planting and a sun-filled seating area for residents of Building 'C' and also serves as a restorative circle.

PEDESTRIAN CIRCULATION

Pedestrian circulation through the site has been established to provide easy, direct and necessary travel to and from major entrances, exits, and destination points.

Two main north-south pedestrian walkways line the parking aisles and building entrances along Building B. This provides a clear and concise connection between the major programming elements, building entrances, and access to the park on the south side of Mikinak Road. Buildings have large, defined paving areas to mark each main building entrance from the street. In addition, all ground floor, barrier free entrances that face Barielle Snow Street and Hemlock Road have direct street access from their private residential patios. Commercial spaces along the road have similar paving and entrance treatments for direct access.

Three meter wide concrete paving is provided between garbage rooms and staging areas for vehicular access. This will be further coordinated as more information becomes available.

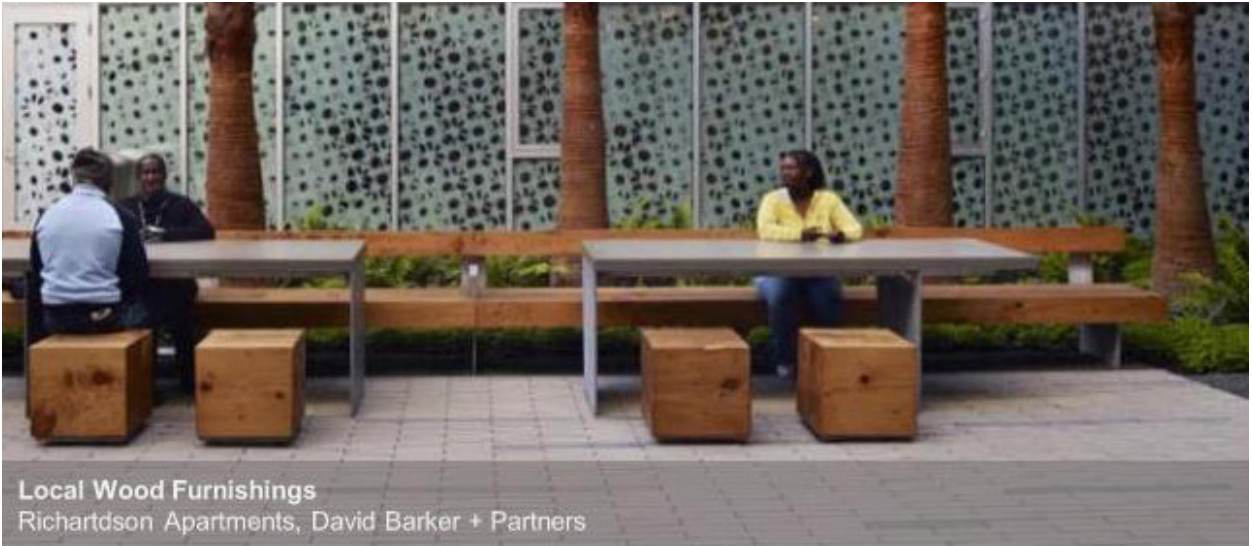


Extract from Landscape drawing LP1101

LANDSCAPE INSPIRATION



Residential Patios – Trellis System for Privacy and Urban Farming
Belfield Townhomes – Onion Flats



Local Wood Furnishings
Richardson Apartments, David Barker + Partners



Gathering Space and Community Gardens
Richardson Apartments – David Barker + Partners



Community Allotment Gardens
Mohawk Way, Fissoreau Architecture



Barrier Free Access and Mulch Bedding
Joel Weeks Park, JRS Studio

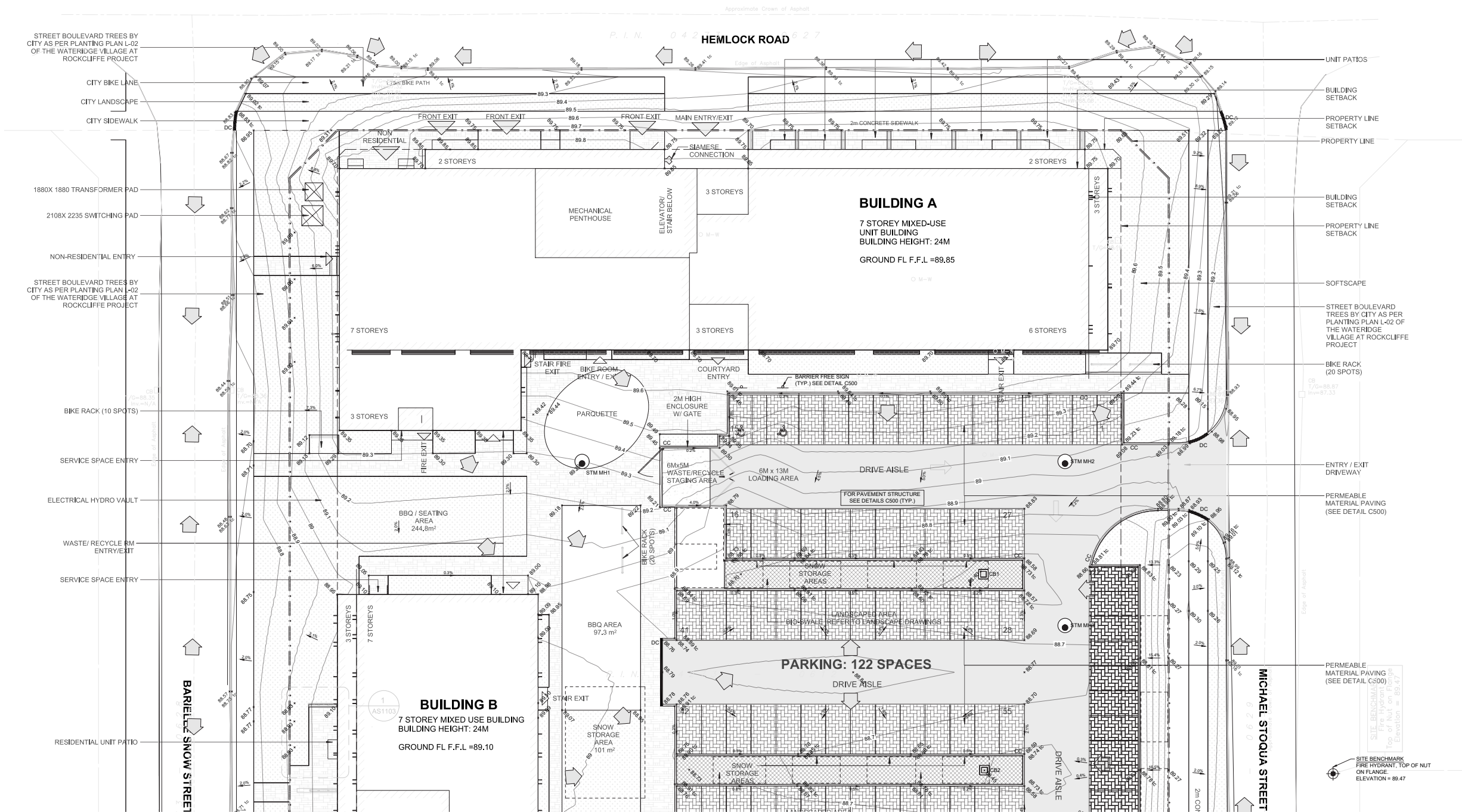


Permeable Unit Paving
Technoblock



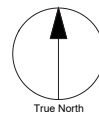
Pollinator Gardens
The High Line – James Corner and Associates

Grading Plan (North)

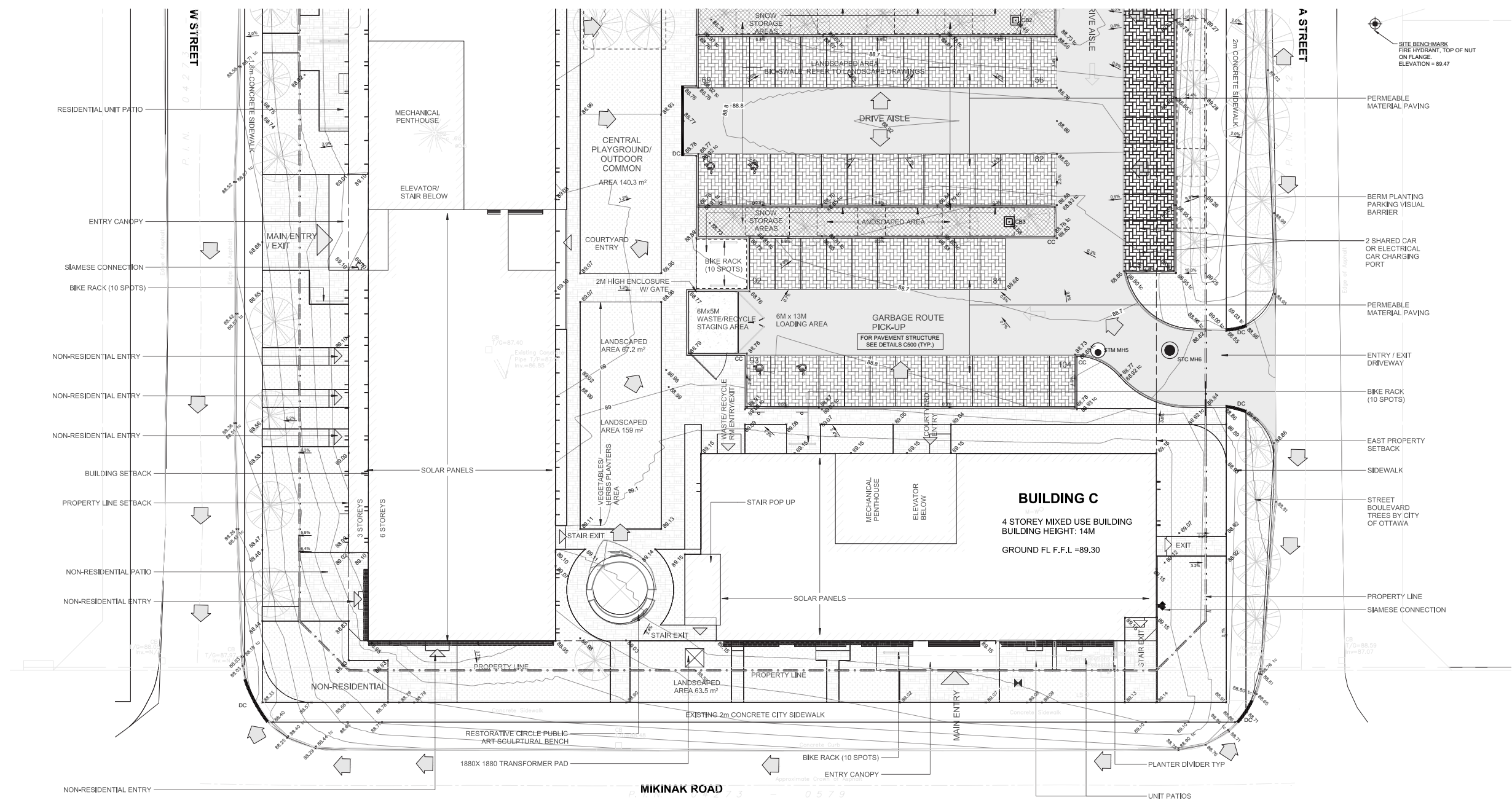


- GENERAL NOTES FOR LOT GRADING**
- ALL LOTS AND BLOCKS FOR PRIVATE USE ON THE LANDS CORRESPONDING TO THIS DESIGN ARE TO BE DEVELOPED IN ACCORDANCE WITH THE PLAN DETAILS AND THESE NOTES.
 - THE DEVELOPER SHALL NOT BE CONSIDERED RESPONSIBLE TO THE CONTRACTOR IN ANY RESPECT FOR THE AMOUNT OF GRADING OR EARTHWORK REQUIRED TO BE PERFORMED BY THE CONTRACTOR DUE TO THE INFORMATION PROVIDED ON THESE DRAWINGS EXCEPT WHERE REQUIRED TO PROMOTE INTERIM DRAINAGE.
 - ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND WITHOUT LOW POINTS EXCEPT WHERE APPROVED SWALES ARE PROVIDED.
 - THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE ALONG SIDE LOT LINES AS REQUIRED TO MAINTAIN THE INTENT OF THE GRADING PLAN. THE CONTRACTOR SHALL COMPLETE THE DRAINAGE SWALES IN THE LOCATIONS AND TO THE GRADES AND ELEVATIONS, DEPTHS AND SECTIONS SPECIFIED ON THE PLAN, PRIOR TO FINAL LANDSCAPING BY THE CONTRACTOR. THE CONTRACTOR SHALL ENSURE THAT THE REQUIRED SWALES ARE CONSTRUCTED IN ACCORDANCE WITH THE GRADING PLAN.
 - ANY EMBANKMENT REQUIRED FOR INTERNAL GRADING IS TO BE COMMENCED ALONG THE INSIDE EDGE OF THE PROPERTY.
 - THE GRADING OF ALL LOTS AND BLOCKS IS TO BE PERFORMED TO PROVIDE FINISHED PERIMETER SURFACES WHICH ARE FLUSH WITH GIVEN STREET LINE, REAR AND SIDE LINE ELEVATIONS.
 - FINAL PERIMETER GRADES FOR A LOT OR BLOCK WHERE NOT OTHERWISE SHOWN HEREON SHALL BE COINCIDENT WITH THE ADJOINING PERIMETER GRADES OF AN ADJACENT LOT OR BLOCK WHICH SHALL HAVE BEEN PREVIOUSLY ESTABLISHED BY, OR CONSTRUCTED IN ACCORDANCE WITH A MUNICIPAL SITE PLAN APPROVAL OR DEVELOPER GRADING APPROVAL.
 - MAXIMUM LOT OR BLOCK GRASS SURFACE GRADE AT ANY LOCATION SHALL BE 8.0% WITH EMBANKMENTS (3:1 MAX.) OR RETAINING STRUCTURES PROVIDED AS REQUIRED TO TAKE UP GRADE DIFFERENTIALS IN EXCESS OF SUCH SLOPES.
 - EMBANKMENTS FORMED DURING THE GRADING OF LOTS AND BLOCKS SHALL HAVE THE FOLLOWING MAXIMUM GRADES:
(A) ADJACENT TO DRIVEWAYS OR SWALE SIDE SLOPES - 4:1 MAXIMUM
(B) ELSEWHERE - 3:1 MAXIMUM
 - MAXIMUM DRIVEWAY GRADES TO BE 10.0%. MAXIMUM PARKING AREA PAVEMENT GRADES TO BE 6%.
 - UNLESS OTHERWISE INDICATED, THE LOT LINE AND CORNER ELEVATIONS SHOWN HEREON ARE GENERALLY THE MINIMUM ELEVATIONS FOR THE SPECIFIED DRAINAGE PATTERN. ANY ALTERATIONS REQUIRE THE WRITTEN APPROVAL OF THE DESIGN ENGINEER.
 - GIVEN THE PROPOSED BUILDING GRADES MAY BE RAISED TO COMPENSATE FOR DIFFERENCES BETWEEN ASSUMED AND ACTUAL BUILDING DIMENSIONS IN ACCORDANCE WITH THE ESTABLISHED CRITERIA FOR THE DRAINAGE PATTERN. REAR SPECIFIED BUILDING GRADE TO BE ESTABLISHED BY CONTRACTOR TO SUIT BUILDING TYPE HOWEVER ALL GRADING REQUIREMENTS IDENTIFIED ON THIS PLAN AND AS REQUIRED BY THE MUNICIPALITY SHALL BE CONFORMED TO.
 - GRADING AND SODDING OF ADJACENT ROADWAY BOULEVARDS WILL BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH MUNICIPAL SPECIFICATIONS.

SITE BENCHMARK
FIRE HYDRANT ON TOP OF NUT OF FLANGE WITH AN ELEVATION OF 89.47, LOCATED ON MICHAEL STOQUA STREET EAST SIDE OF ROADWAY.



Grading Plan (South)

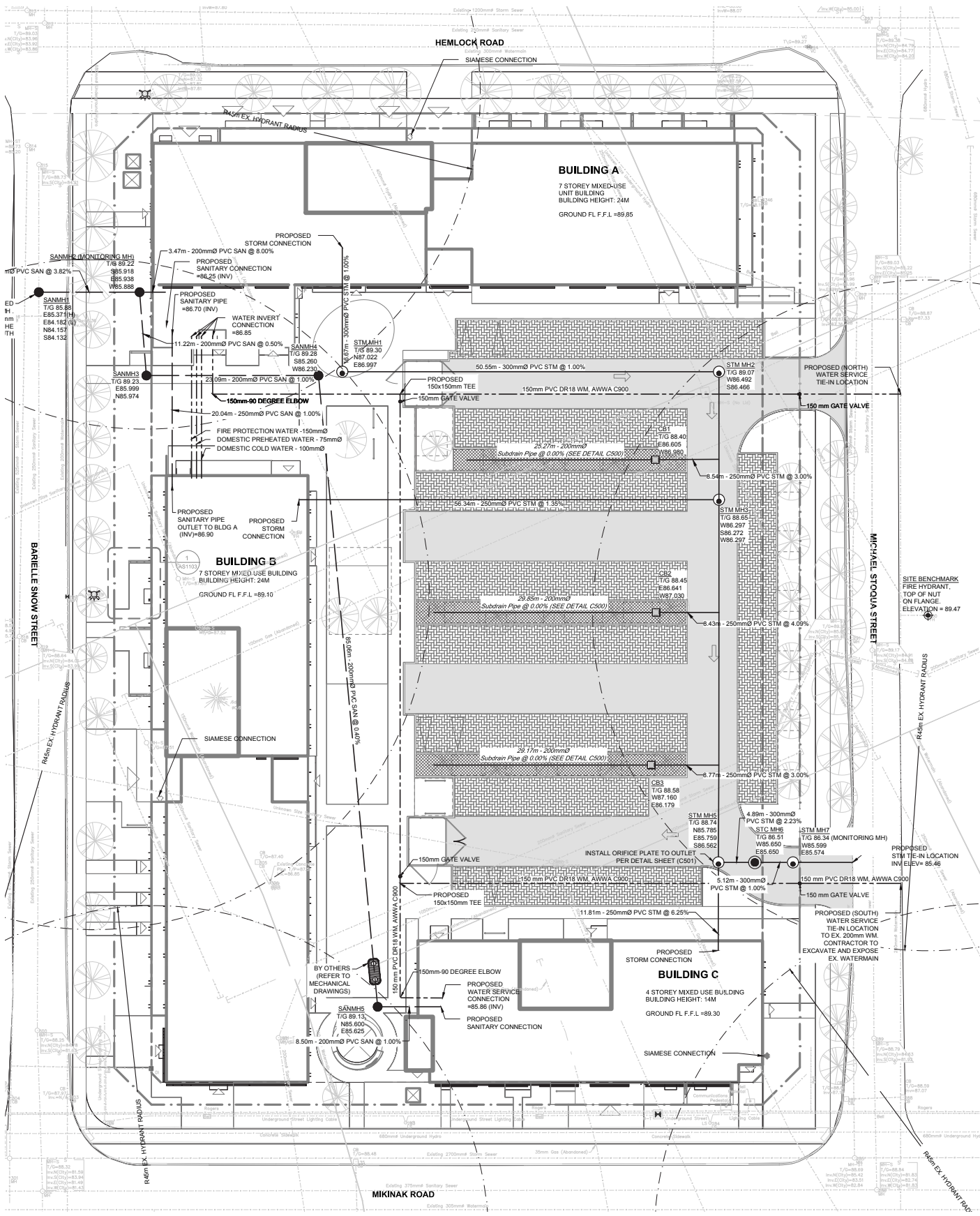


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1. ALL LOTS AND BLOCKS FOR PRIVATE USE ON THE LANDS CORRESPONDING TO THIS DESIGN ARE TO BE DEVELOPED IN ACCORDANCE WITH THE PLAN DETAILS AND THESE NOTES.
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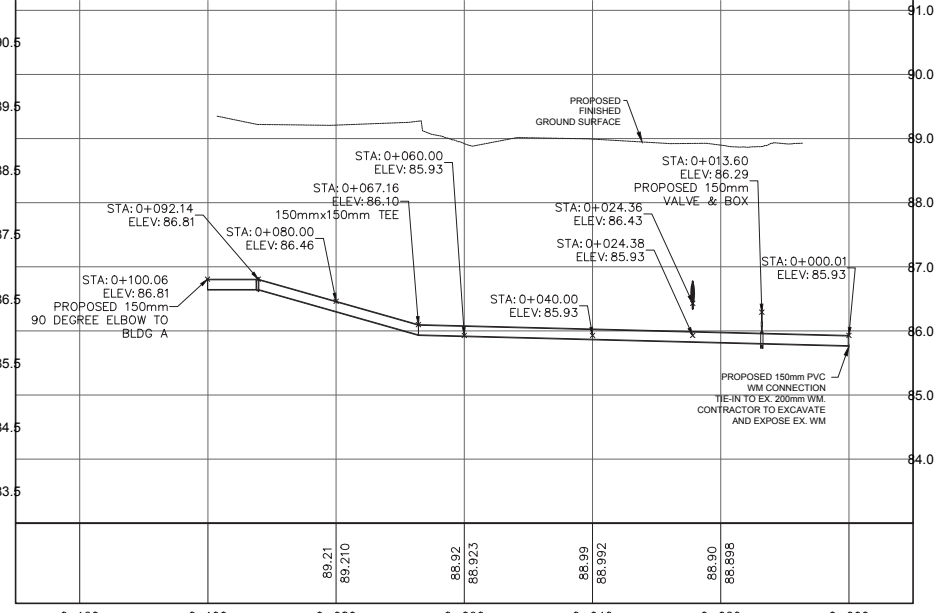
SITE BENCHMARK
FIRE HYDRANT ON TOP OF NUT OF FLANGE WITH AN ELEVATION OF 89.47, LOCATED ON MICHAEL STOQUA STREET EAST SIDE OF ROADWAY.

True North

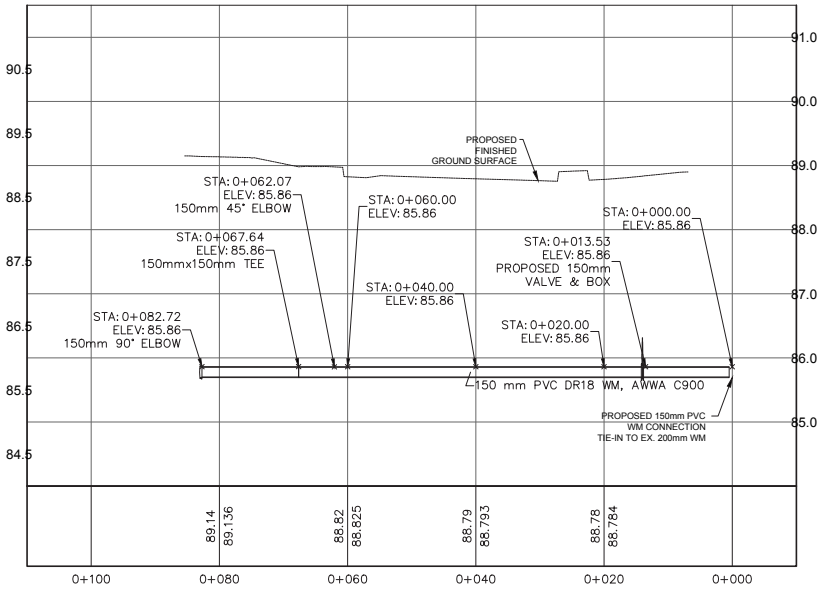
Servicing Plan



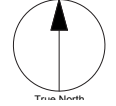
- 1.5 CONTRACTOR TO VERIFY EXISTING SANITARY PIPE CONDITION, LOCATION, AND ELEVATION PRIOR TO CONSTRUCTION, AND TO PROVIDE GRAVITY DRAIN FOR PROPOSED BUILDING BASEMENT LEVELS.
- 1.6 EXISTING SANITARY SEWER SERVICES PROPOSED FOR REMOVAL SHALL BE DISCONNECTED AND ABANDONED AT THE MAIN (UNLESS OTHERWISE STATED) TO THE SATISFACTION OF CITY OF OTTAWA. A NOTIFICATION OF 48 HRS IN ADVANCED SHALL BE PROVIDED TO THE CITY OF OTTAWA PRIOR TO ANY CONSTRUCTION WORKS.
- 2.0 WATER**
- 2.1 ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE.
- 2.2 WATERMAIN PIPE AND SERVICES TO BE PVC OR COPPER AS PER ONTARIO BUILDING CODE. ALL PIPE AND FITTINGS SHALL BE CERTIFIED CSA B137.3. PROVIDE A MINIMUM COVER OF 1.8m AND INSTALL AS PER OPSD 1102.02 TYPE 2. PROVIDE A MINIMUM OF 0.5m VERTICAL SEPARATION BETWEEN WATERMAIN CROWN AND SEWER INVERT AT ALL CROSSINGS.
- 2.3 WATER SERVICE TIE-IN (LIVE TAP) TO BE PERFORMED BY AUTHORIZED PERSONNEL AS PER APPROVAL OF CITY OF OTTAWA. ALL SITE WORKS FOR COMPLETION OF LIVE TAP ARE TO BE PERFORMED BY THE CITY. CONTRACTOR TO BACKFILL AND PROVIDE RESTORATIONS.
- 2.4 ALL VALVES TO COMPLY WITH CITY OF OTTAWA DESIGN GUIDELINES.
- 2.5 THE PROPOSED WATER SERVICE PROVIDES DOMESTIC WATER SUPPLY ONLY. ALL PROPOSED BUILDING FIRE WATER SUPPLY AND PROTECTION MEASURES/SPRINKLER SYSTEMS, IF REQUIRED, ARE TO BE DESIGNED BY OTHERS AT THE DETAILED BUILDING DESIGN STAGE IN ACCORDANCE WITH BUILDING CODE REQUIREMENTS.
- 2.6 A NOTIFICATION OF 48 HRS IN ADVANCED SHALL BE PROVIDED TO CITY OF OTTAWA PRIOR TO ANY CONSTRUCTION WORKS.
- 3.0 WATER SERVICE NOTE**
- 3.1 WATER SERVICE LINE CONNECTION FROM WATERMAIN SHALL BE PVC DR18, AWWA C900 w/ STANDARD GATE VALVE SHUT OFF LOCATED AT PROPERTY LINE.
- 4.0 STORM**
- 4.1 ALL STORM SEWER MAINS TO BE CSA CERTIFIED HDPE UNLESS OTHERWISE APPROVED/NOTED. ALL SEWERS TO BE INSTALLED AS PER MANUFACTURERS INSTRUCTIONS, USING ONLY FACTORY FITTINGS.
- 4.2 STORM MAINTENANCE HOLES TO BE AS PER OPSD 701.01 FOR 1.2mØ, OPSD 701.012 FOR 1.8mØ, OPSD 701.013 FOR 2.4mØ. ALL c/w BENCHING.
- 4.3 ALL CATCH BASINS TO BE AS PER OPSD 705.01, FRAME & GRATE AS PER 400.01, LEAD TO BE HDPE.
- 4.4 STORM MH FRAMES AND COVERS TO BE OPEN TYPE, AS PER OPSD 401.01 TYPE B. CONTRACTOR TO INSTALL FILTER CLOTH UNDER STORM MH COVERS UNTIL THE BASE COURSE OF ASPHALT IS APPLIED.
- 4.5 STRAW BALE CHECK DAMS SHALL BE PLACED AROUND CB'S TEMPORARILY UNTIL SITE VEGETATION HAS BEEN STABILIZED.
- 4.6 ALL CB LEADS TO BE AT LEAST 0.5m FROM WATER AND SANITARY SEWER MAIN.



PROPOSED WATERMAIN NORTH CONNECTION FOR BLDG A & B

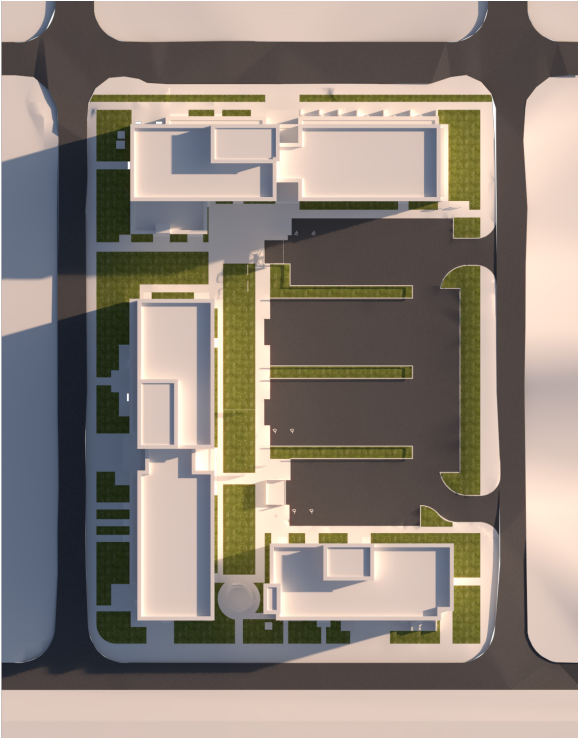
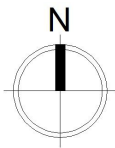


PROPOSED WATERMAIN SOUTH CONNECTION FOR BLDG C

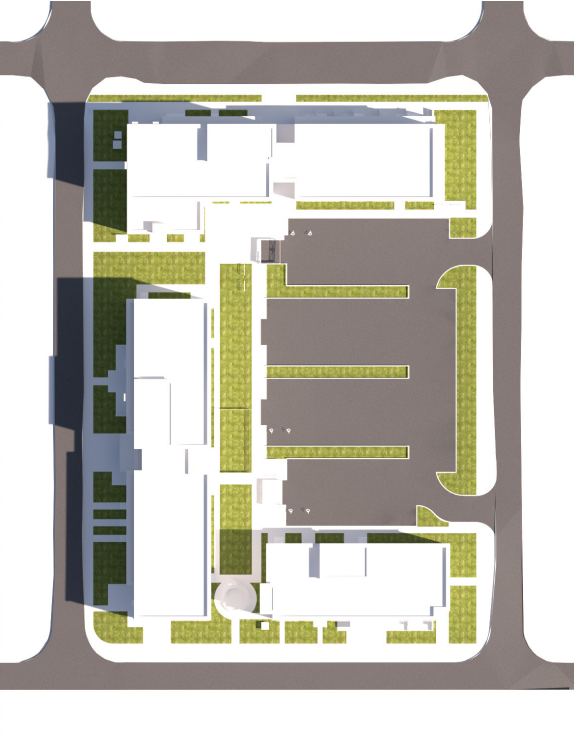


Shadow Analysis

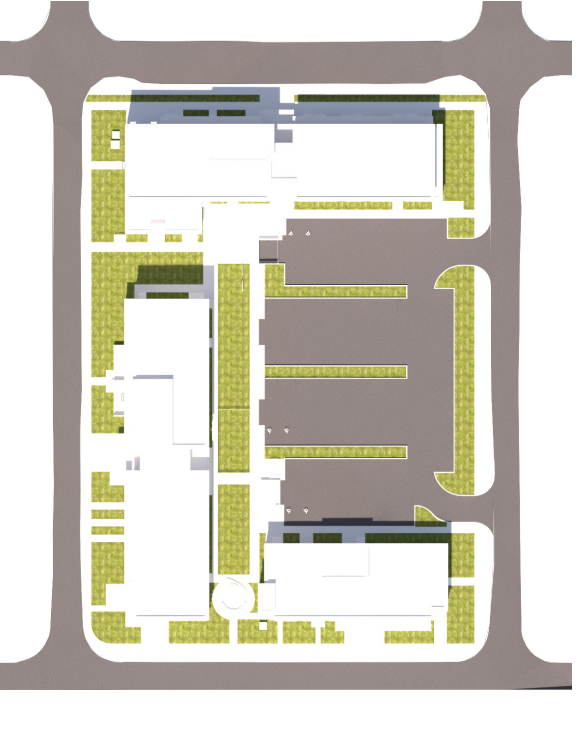
SHADOW STUDY – SUMMER SOLSTICE



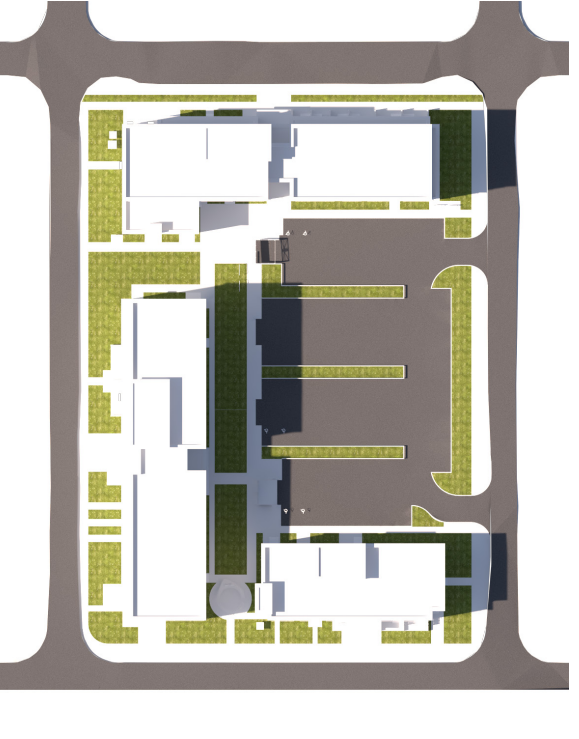
SUMMER SOLSTICE 6 AM



SUMMER SOLSTICE 9 AM



SUMMER SOLSTICE 12 PM



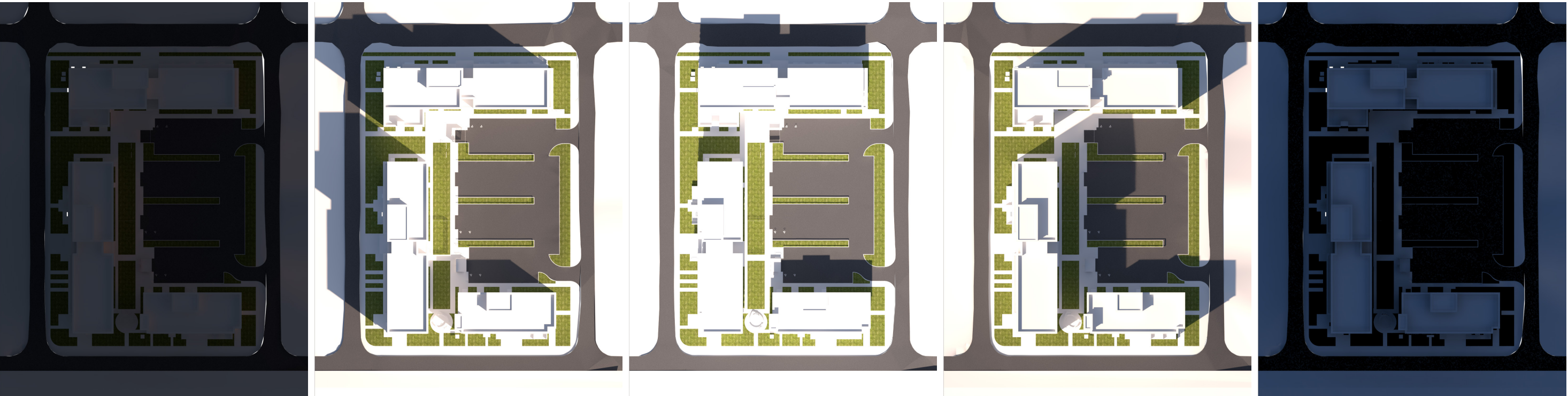
SUMMER SOLSTICE 3 PM



SUMMER SOLSTICE 6 PM



SHADOW STUDY – EQUINOX



EQUINOX 6 AM

EQUINOX 9 AM

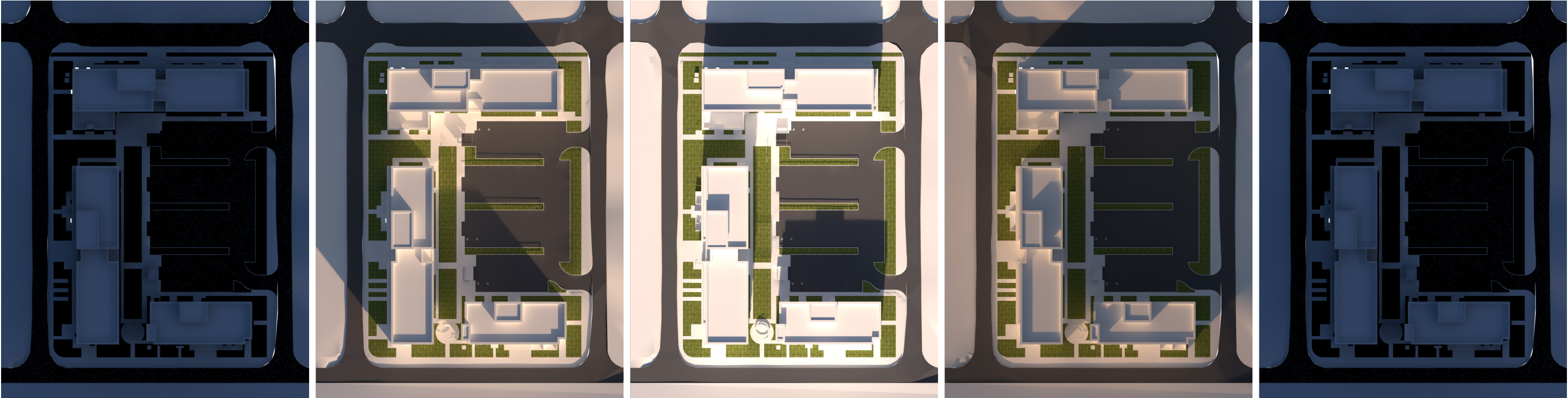
EQUINOX 12 PM

EQUINOX 3 PM

EQUINOX 6 PM



SHADOW STUDY – WINTER SOLSTICE



WINTER SOLSTICE 6 AM

WINTER SOLSTICE 9 AM

WINTER SOLSTICE 12 PM

WINTER SOLSTICE 3 PM

WINTER SOLSTICE 6 PM



Wind Analysis

Winds in Ottawa are generally Westerlies averaging 13 km/h (8.1 mph) but tend to be slightly more dominant during the winter.

