

# zen इण्डिया

PROPOSED MIXED USE DEVELOPMENT  
AT  
189 MILNER, TORONTO

DEVELOPMENT OVERVIEW DOCUMENT

#### Consultant Team



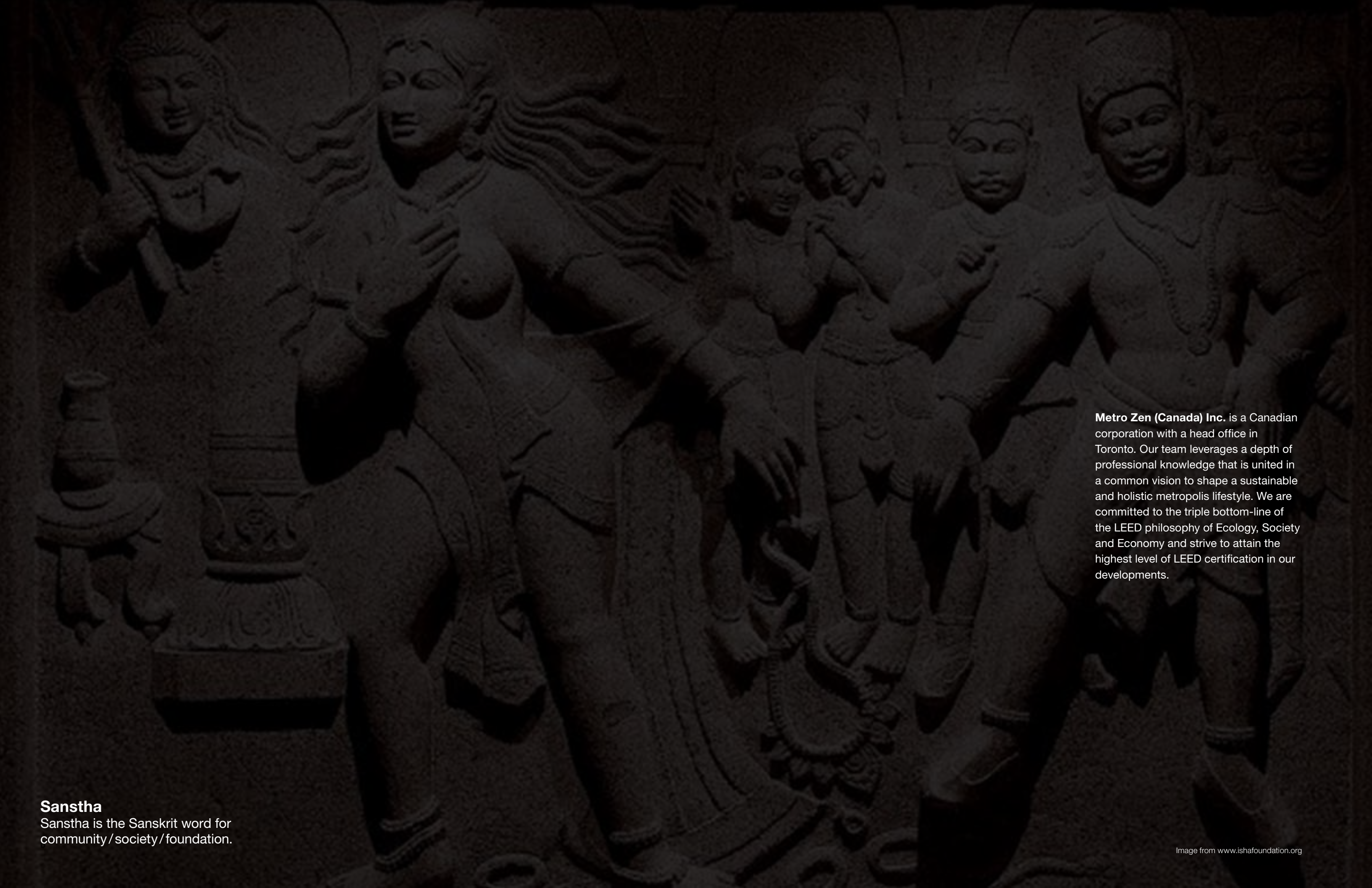
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July 26, 2013





**Metro Zen (Canada) Inc.** is a Canadian corporation with a head office in Toronto. Our team leverages a depth of professional knowledge that is united in a common vision to shape a sustainable and holistic metropolis lifestyle. We are committed to the triple bottom-line of the LEED philosophy of Ecology, Society and Economy and strive to attain the highest level of LEED certification in our developments.

**Sanstha**

Sanstha is the Sanskrit word for community/society/foundation.



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# 1 INTRODUCTION





Isha Foundation, Coimbatore, India  
Image from [www.ishafoundation.org](http://www.ishafoundation.org)

## Introduction

**Met**ro Zen (Canada) Inc. proposes to develop the property at 189 Milner Avenue for an integrated mixed use development that is estimated to provide between 386 to 596 new jobs.

The purpose of this document is to provide a summary of the proposed development and present preliminary information related to the proposed redevelopment of the property to a mixed use development.





# **2 DEVELOPMENT CONCEPT**





## Development Concept

189 Milner Avenue will be developed for a mix of uses centred on spirituality and meditation to care for the mind, traditional medicines to care for the body, hotels and convention space for visitors, accommodating the needs of an aging population, and a business incubator centre. The development has been conceived and designed to meet the needs of ethnic communities in the areas of health, spirituality, care for the aged, and economic development.

In consideration of the city’s overall guidelines for urban grid development and thinking beyond the goals of increasing property tax bases, generating new revenue streams and solid job creation, Metro Zen is uniquely poised to bring together cost-effectively all of the above including sound elements in

- environmental design
- holistic lifestyle
- integrated innovation centre, and
- community collaborating and co-existing in harmony

Metro Zen has thoughtfully addressed future trends by incorporating into its developments the societies that are already successfully using strategies to bridge the chasms between economics, environmentalism and social justice.

The overall Development Concept for the property consists of several integrated components.

The proposed hotels and convention facilities; commercial and retail complex; meditation centre; natural healing and wellness facilities; independent centre for seniors along with the innovation incubators intends to fuel revenue growth and create long-term employment. The innovation incubator and healing centre, transforms the way people live and work. It provides the opportunity for:

- collaboration and sharing of resources both economically and in the transfer of knowledge through research and development; and
- seniors to contribute to their community by mentoring others; invest in start-ups and fund the business expansion; and tap into natural healing, wellness programs and meditation to reduce stress.



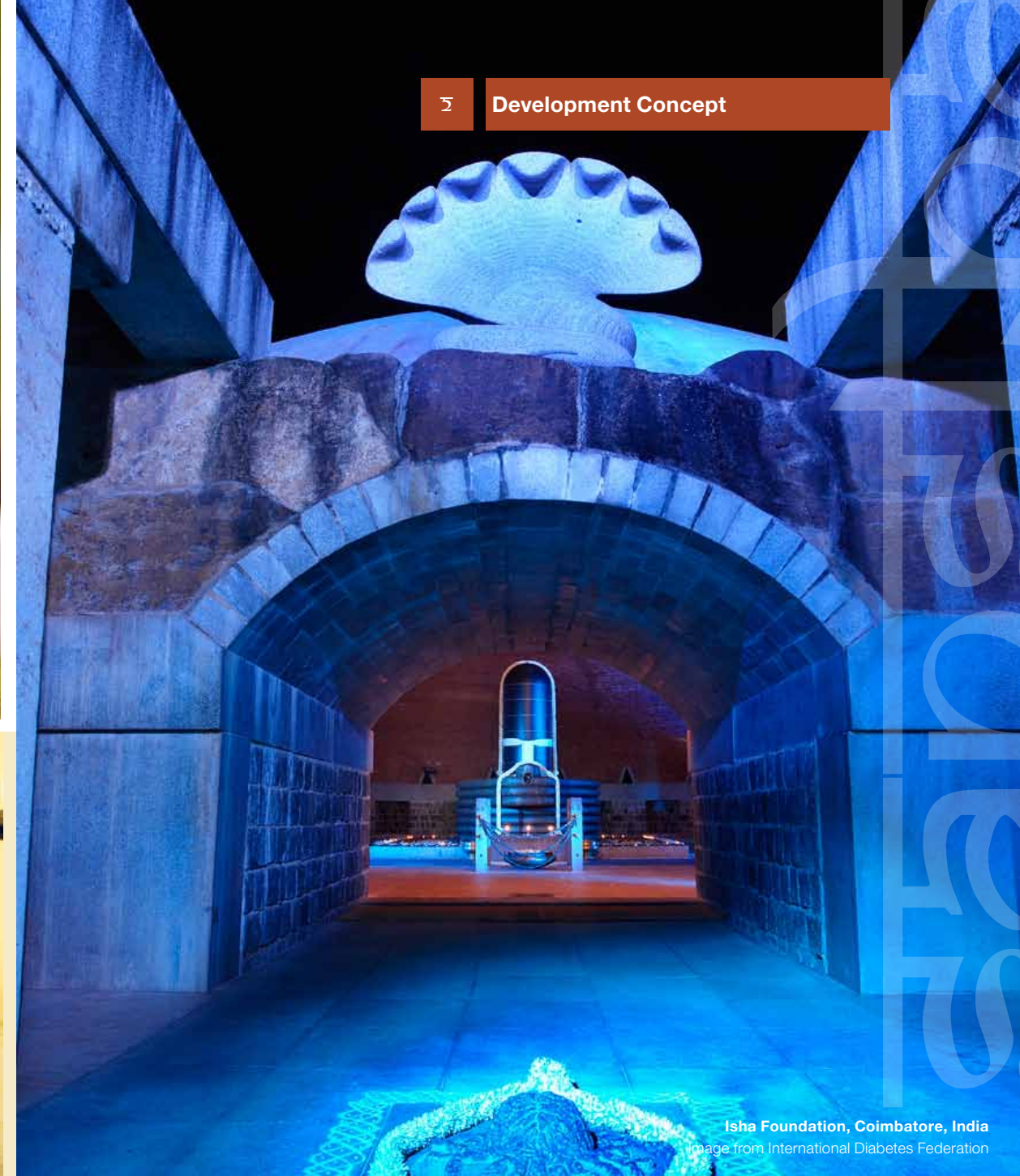


Dhyanalinga Yogic Temple, India  
Image from [www.dhyanalinga.org](http://www.dhyanalinga.org)





Image from www.ishafoundation.org



Isha Foundation, Coimbatore, India  
Image from International Diabetes Federation



Image from Bjarke Ingels Group



Image from www.ishafoundation.org

## a) Meditation Centre (Isha Foundation)

The Meditation Centre anchors the overall development.

The building contains approximately 950 square metres of space for meditation.

It is proposed that the meditation centre will be operated by the Isha Foundation as one of its 150 centres worldwide. The Isha Foundation uses a customized system of yoga to create physical, mental, and emotional wellbeing for all through a meditative process that is widely practiced by multi-faith ethnic communities.

The Isha Foundation was founded by Sadhguru, a yogi, mystic, humanitarian and spiritual leader. Sadhguru's work is aimed at achieving the physical, mental, and spiritual well being of all persons.





“A wellness centre based on natural healing concepts.”



## b) Ayurvedic Centre

The Ayurvedic Centre is a space for practitioners of Ayurvedic medicine. Ayurveda is a system of traditional medicine native to India and a form of alternative medicine. It is estimated that 80 percent of persons in India use some form of traditional medicines, including traditional medicines like Ayurveda.

The Ayurvedic Centre contains approximately 8,500 square metres of floor area.







# Ayurvedic relaxation





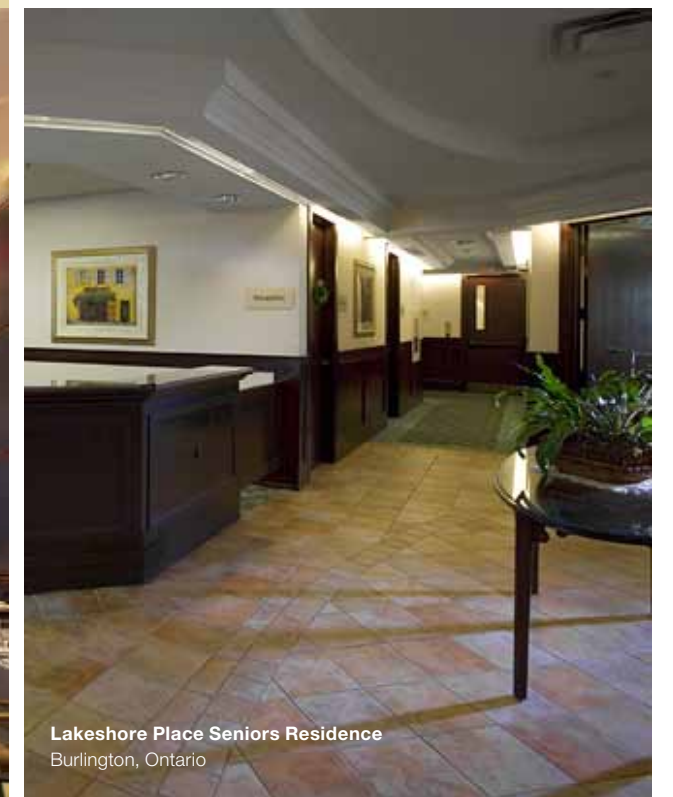
**Ritz Carlton**  
Toronto, Ontario



**The Carina At Harbour Green**  
Vancouver, British Columbia



**The Hazelton Hotel & Residences**  
Toronto, Ontario



**Lakeshore Place Seniors Residence**  
Burlington, Ontario





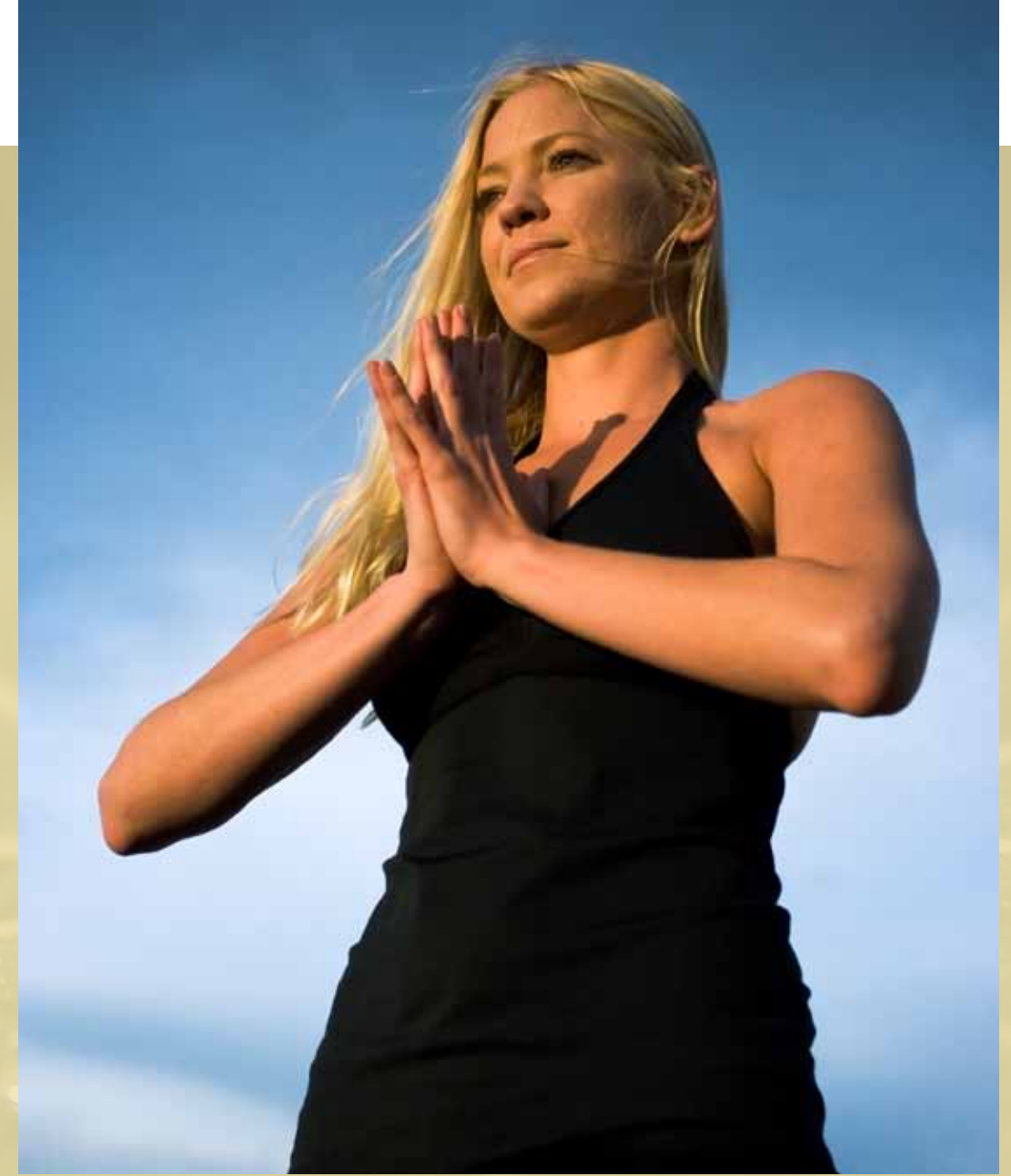
Markham Family Health Team  
Markham, Ontario

## c) Hotel

A high-end hotel of approximately **24,000 square metres** of floor area will accommodate visitors to Toronto. The hotels will serve visitors coming to Toronto and the site to use the Meditation Centre or to be treated in the Ayurvedic Centre.

**5,500 square metres** of convention centre space along with approximately **5,500 square metres** of complementary commercial space





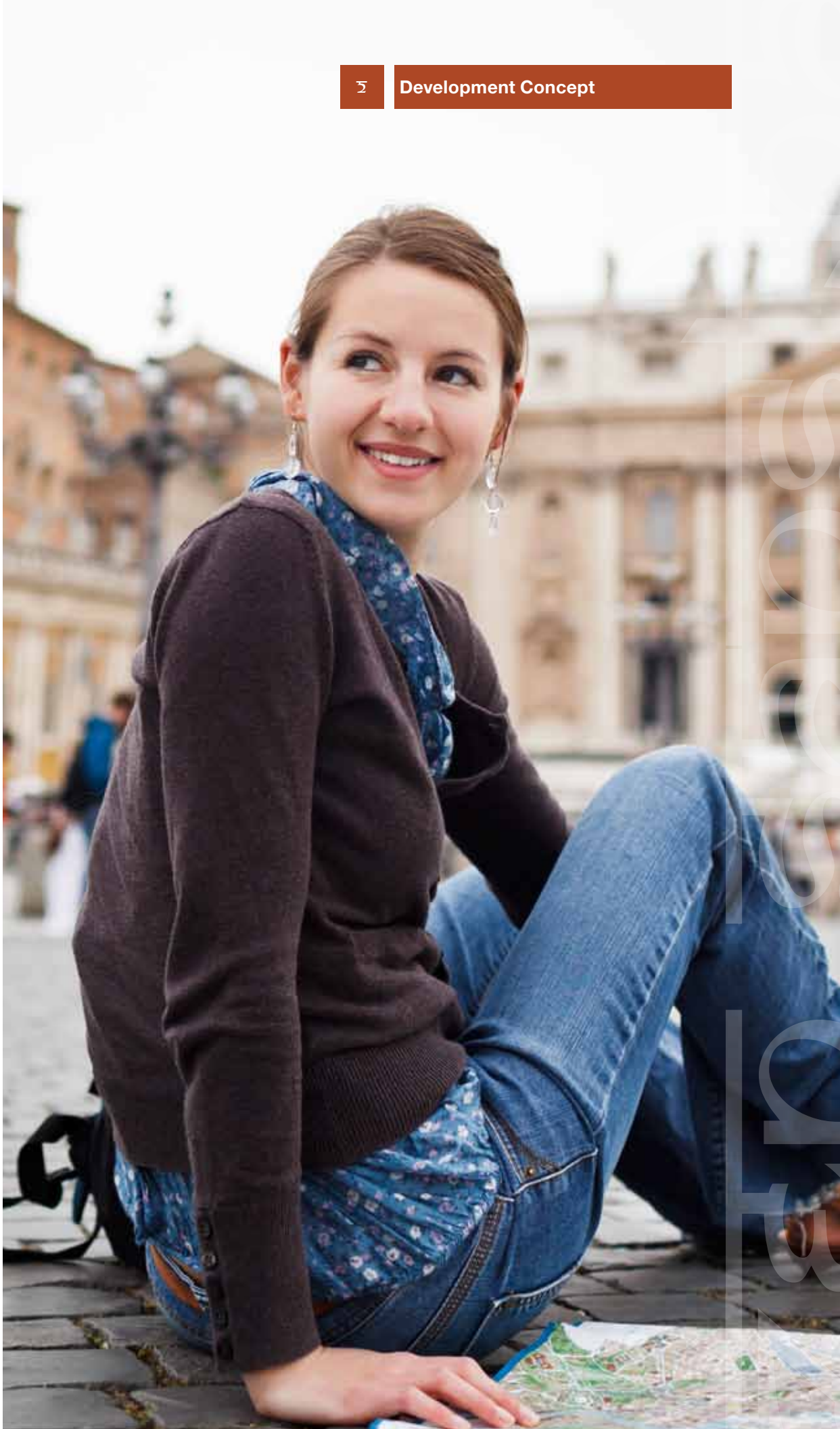




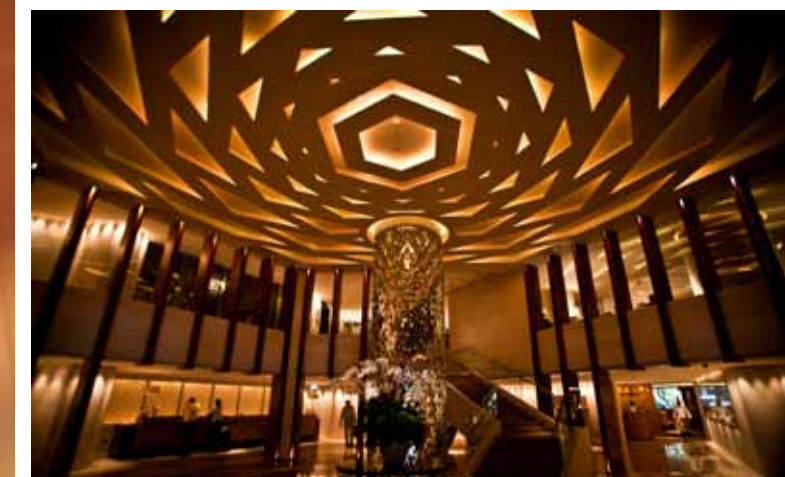
### d) Dharamshala Hotel

A Dharamshala hotel of approximately 24,000 sq m floor area is also proposed on the site.

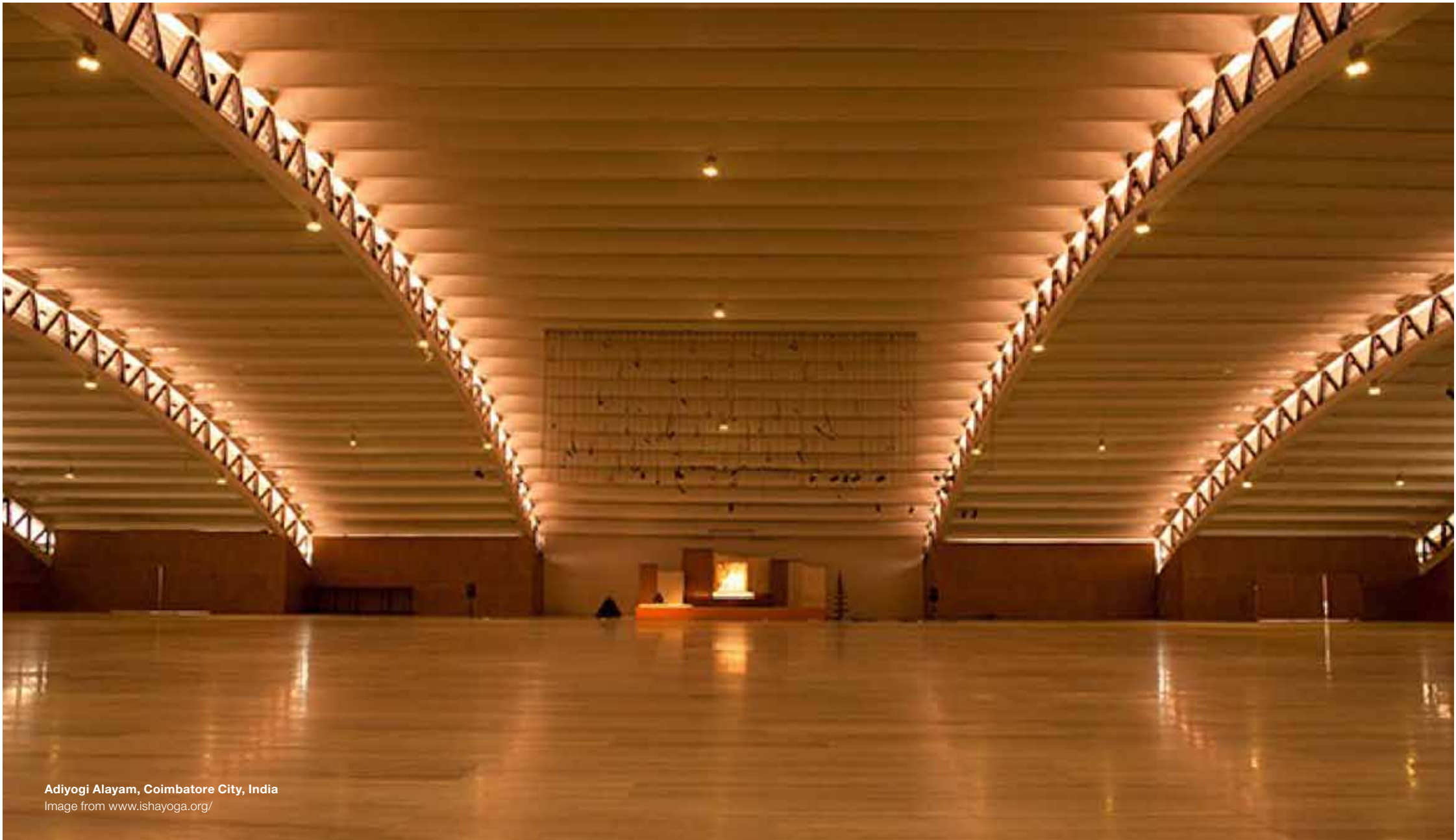
Dharamshalas are budget-hotels for spiritual/religious tourists and backpackers on budget. The hotels will provide basic accommodation and communal kitchens and dining. This hotel is closely tied to the Meditation and Ayurvedic Centre/Health Facility.











Adiyogi Alayam, Coimbatore City, India  
Image from [www.ishayoga.org/](http://www.ishayoga.org/)

## e) Convention Centre

Approximately 5,500 square metres of convention centre space will be included in the high-end hotel.



## f) Zen Innovation Centre

The Zen Innovation Centre in its **19,000 square metres** of space will provide a place where persons can access each other's resources, experience, connections and ideas. The Centre is designed to address the capacity and resource challenges faced by recent graduates and immigrants to Canada. It will provide a stage for hardworking knowledgeable entrepreneurs of all ethnic backgrounds to develop their ideas. They will fulfill their dreams and create business opportunities for themselves and their families. This will in-turn help in creating more jobs. Mature immigrants and recent graduates with vast amount of overseas experience will receive guided Canadian experience to achieve personal success in Canada.

The Zen Innovation Centre is a co-working space and incubator for employment and business creation. The interactions between recent graduates, entrepreneurs, and mentors will catalyze innovation and trigger innovation. The interactions between mature immigrants, recent graduates, entrepreneurs, and mentors will catalyze innovation and trigger innovation.

Co-working spaces as proposed in the Zen Innovation Centre have proven popular with freelancers, entrepreneurs, independent professionals, startups or persons who seek an alternative to the isolation of working in a home office. Such work places respond to the nature of work and business networks in today's economy.

**“An incubator for technology and social service organizations and not-for-profits. Shared office spaces; nurturing a culture of interaction and idea generation”**







**Weirfoulds**  
Toronto, Ontario



**Hicks Morley**  
Toronto, Ontario



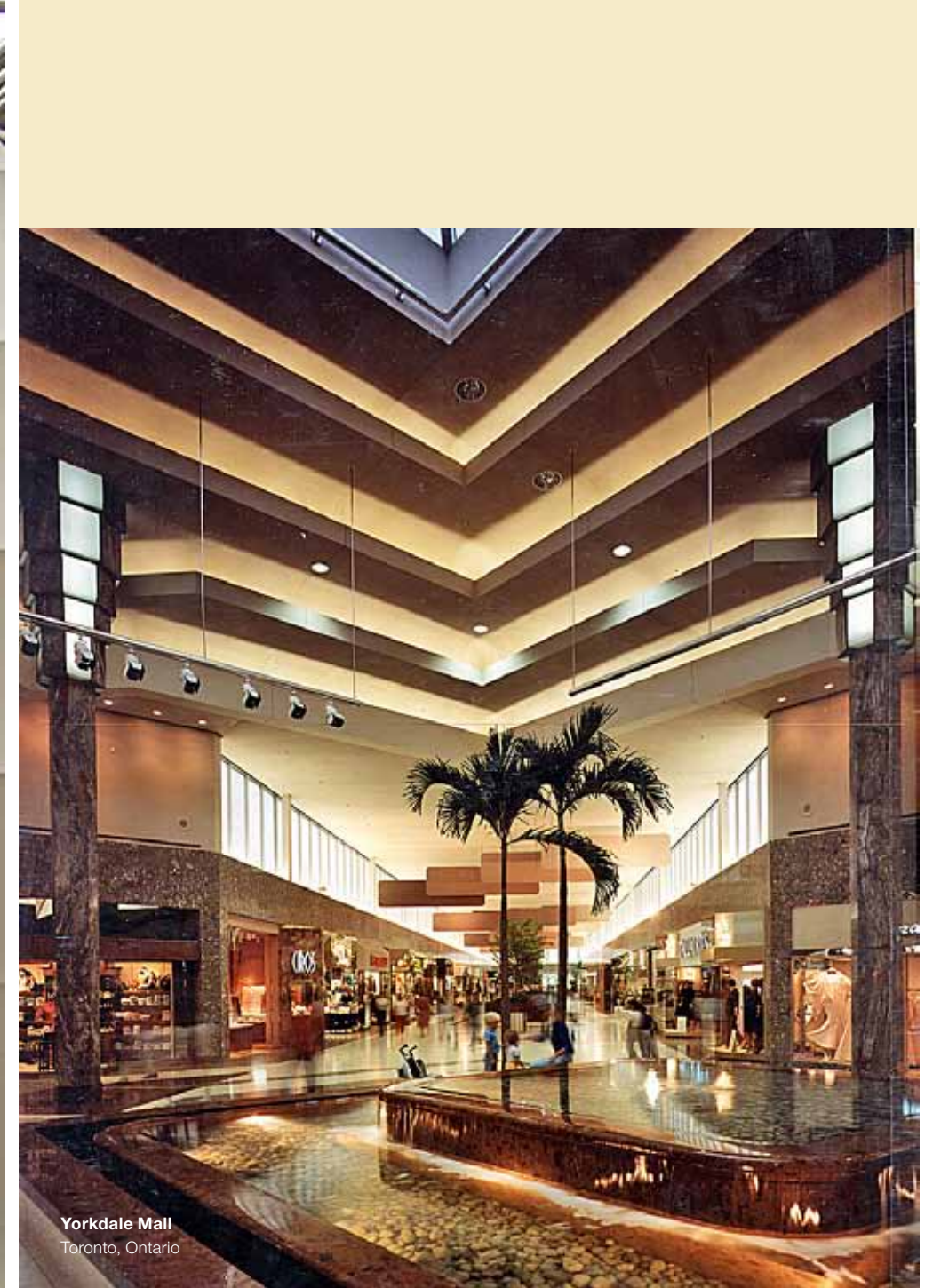
**KPMG**  
Toronto, Ontario

**Fasken Martineau**  
Vancouver, British Columbia





Hazelton Lanes Shopping Centre  
Toronto, Ontario



Yorkdale Mall  
Toronto, Ontario







Holt Renfrew Cafe  
Toronto, Ontario

### g) Commercial Uses

Approximately 5,500 square metres of retail space will be included along with the convention centre and high-end hotel.



Kraft  
Toronto, Ontario





St. Vincent's Heather  
Vancouver, British Columbia





Holt Renfrew  
Toronto, Ontario



St. Vincent's Heather  
Vancouver, British Columbia



111 Avenue Rd. Leisureworld Seniors Residence  
Toronto, Ontario



### **h) Avkash Sanstha (Seniors Retirement)**

Two buildings providing retirement facilities will be developed on the site.

Each building contains a floor area of approximately 15,000 square metres.

These buildings will provide culturally appropriate facilities, support and fellowship for aged members of the South Asian community. Other uses on the property provide additional support for seniors and opportunities for social interaction.





# **3 DEVELOPMENT STATISTICS**



## a) Development Statistics

Table 1 summarizes the development statistics for the proposed development.

Table 1: Development Statistics	
	Square Metres
Meditation Centre	950
Hotel	23,000
Dharmshala Hotel	24,000
Avkash Sanstha (Seniors Retirement)	15,000
Avkash Sanstha (Seniors Retirement)	15,000
Zen Innovation Centre	19,000
Ayurvedic Centre	8,500
Commercial	5,500
Convention Centre	5,500
<b>TOTAL</b>	<b>116,450</b>



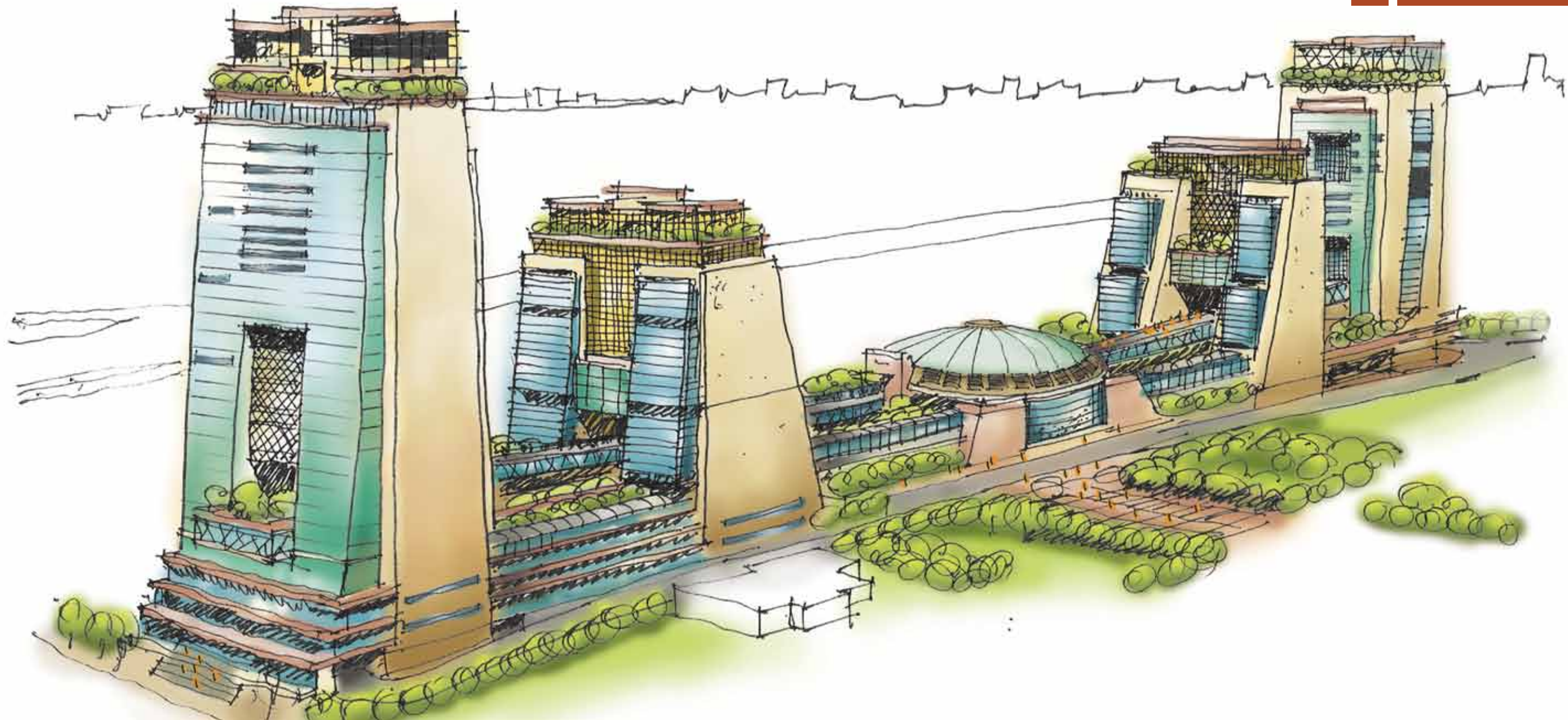
# 4 PLANNING OVERVIEW

189 Milner Avenue is designated Employment Area by the Toronto Official Plan. Uses that support business and economic activity such as hotels, offices and small scale stores and services are permitted in Employment Areas. Places of worship are permitted on major streets like Markham Road.

Many of the uses proposed for 189 Milner Avenue conform to the land use policies for development in Employment Areas. Some of the uses proposed for this mixed use development such as the proposed seniors retirement facilities require approval of an amendment to the Employment Area policies to permit limited residential uses as part of the mixed use development.

The City of Toronto is currently completing a Municipal Comprehensive Review of the policies and designations for Employment Areas. The owner of 189 Milner Avenue has asked that the property and proposed development be included by staff in the Municipal Comprehensive Review.





The mixed use development proposed for 189 Milner Avenue is located within a precinct bounded by Markham Road, Milner Avenue and Executive Court. This precinct is currently developed with a range of land uses. Adjacent land uses consist of a mix of institutional, senior's residential apartments as well as employment uses. These include:

- Saints Peter and Paul Ukrainian Catholic Church (1490 Markham Road)
- Saints Peter and Paul Seniors Apartments and Retirement Home (221 Milner Avenue)
- Saints Peter and Paul Banquet Hall (231 Milner Avenue)
- Blaisdale Montessori School (231 Milner Avenue)
- Malvern Baptist Church (185 Milner Avenue)
- Storwell Self Storage (85 Executive Court)

The majority of the existing land uses adjacent to 189 Milner Avenue consist of non-employment uses. The adjacent Saints Peter and Paul residential and institutional development is similar in its land uses to portions of the mixed use development proposed for 189 Milner Avenue. The Saints Peter and Paul uses are non-employment uses and have coexisted in harmony with nearby employment uses since the early 1980s.

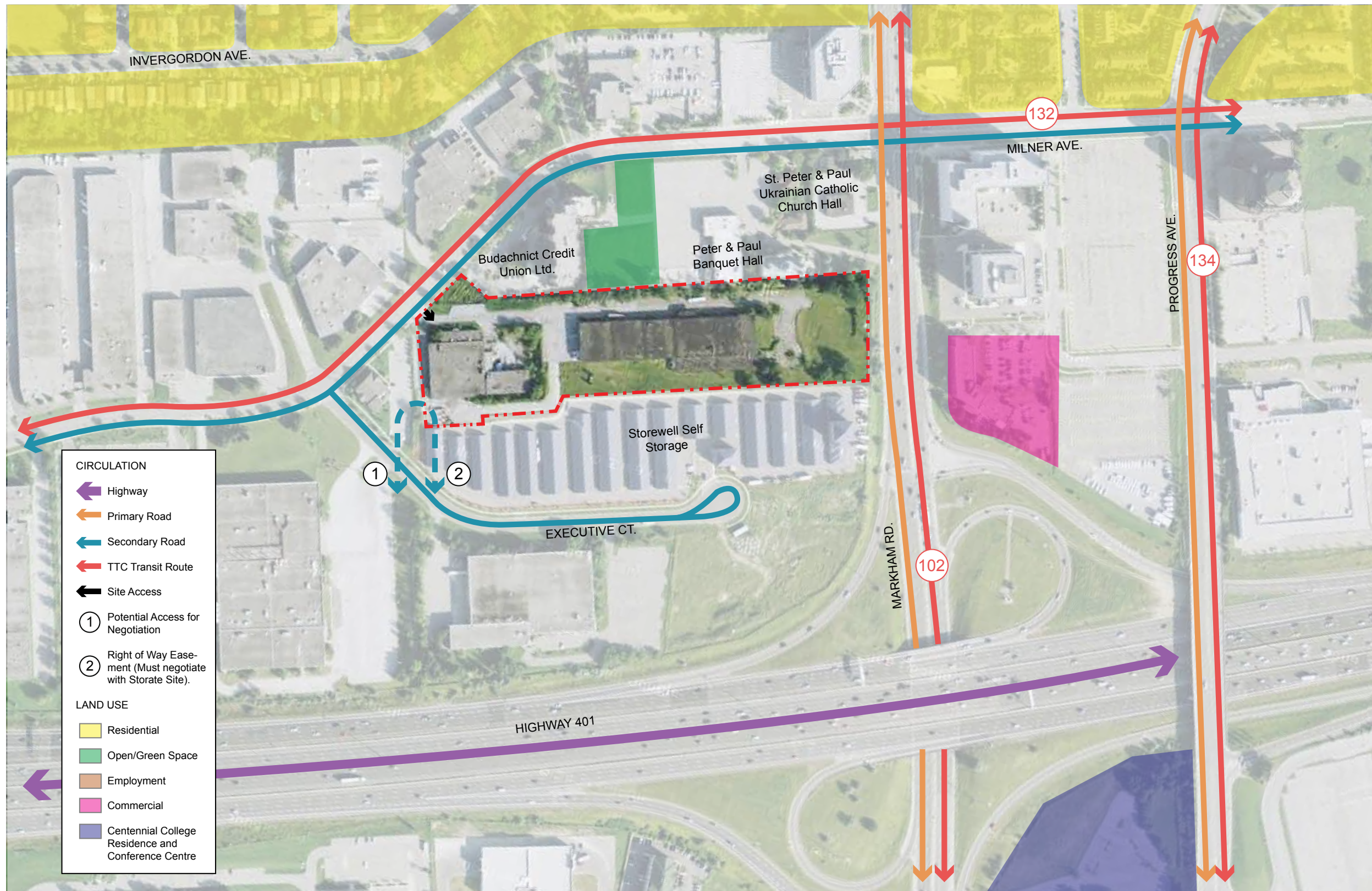
Storwell Self Storage is located immediately to the south of 189 Milner Avenue. This warehouse development supports quite minimal on-site employment since it is self storage warehousing.

The immediate land use context for 189 Milner Avenue is created by existing development which consists primarily of non-employment uses. This context is relevant to the consideration of the mixed use development proposed for 189 Milner Avenue.

In view of the almost 30 year history of non-employment uses in this precinct coexisting with employment uses in the area, the proposed mixed use development at 189 Milner Avenue complies with every intention of creating jobs. The proposed development works well with adjacent residential, institutional and employment uses and not expected to undermine business activity in the immediate area.

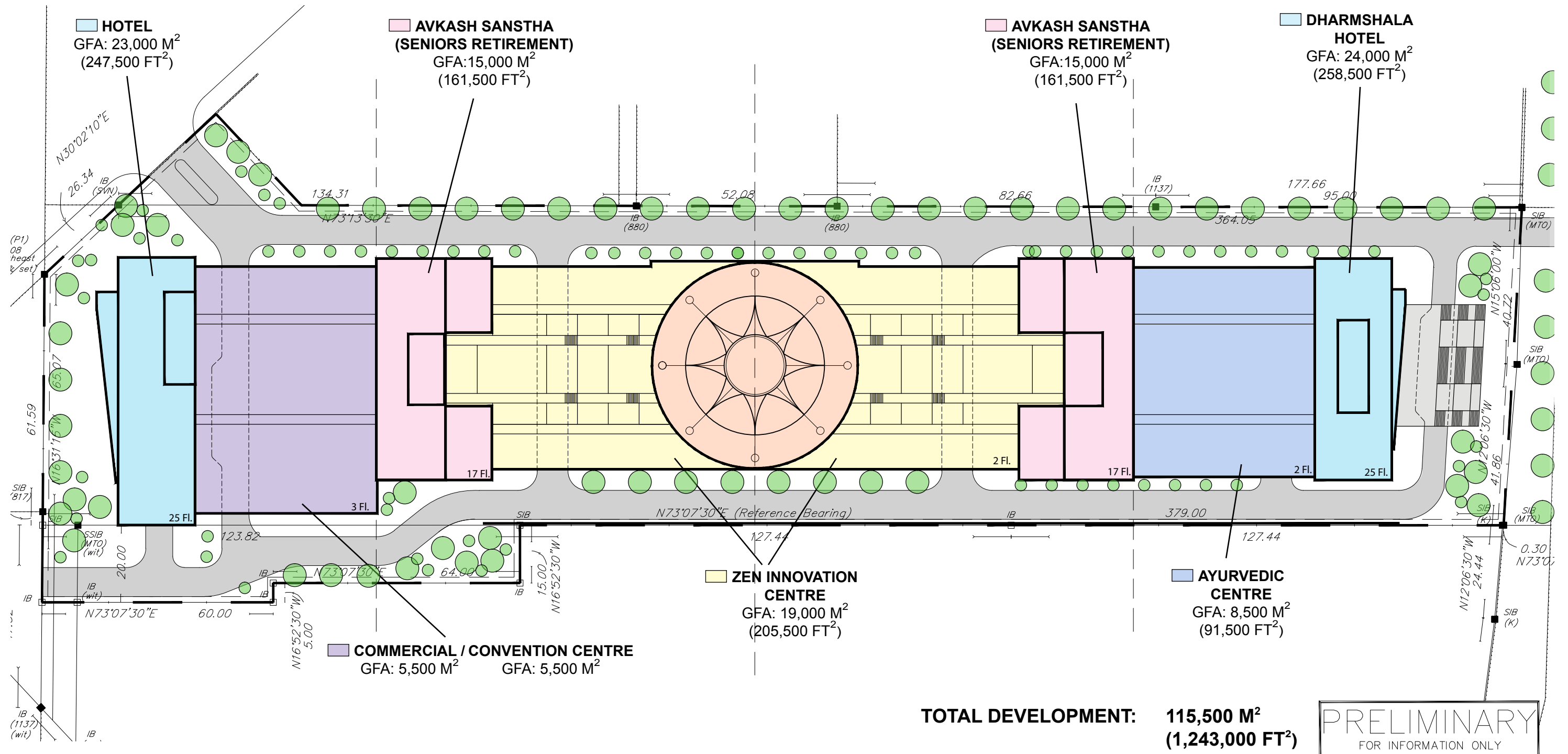


# a) Context Plan



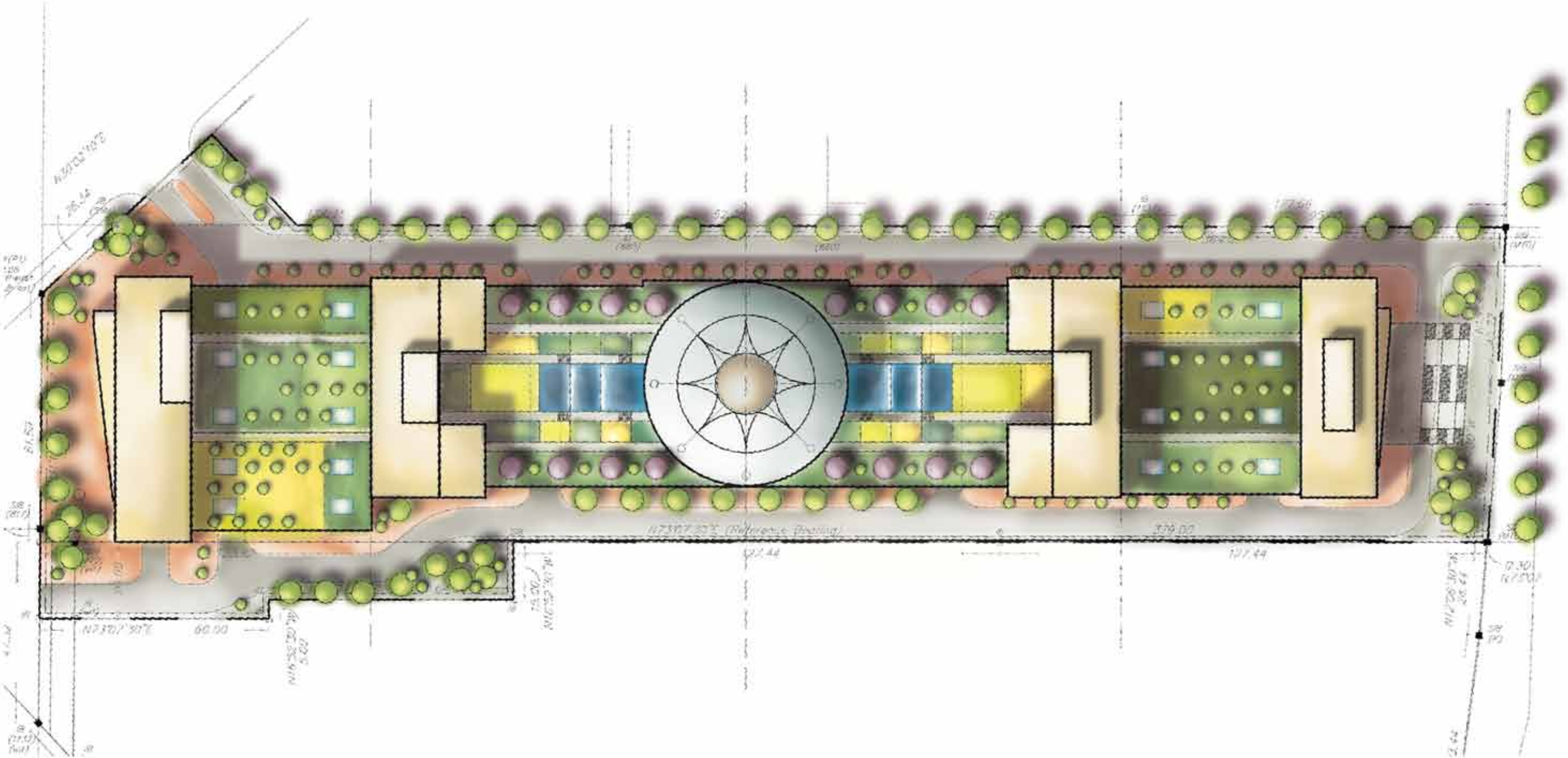


## b) Proposed Land Use Plan



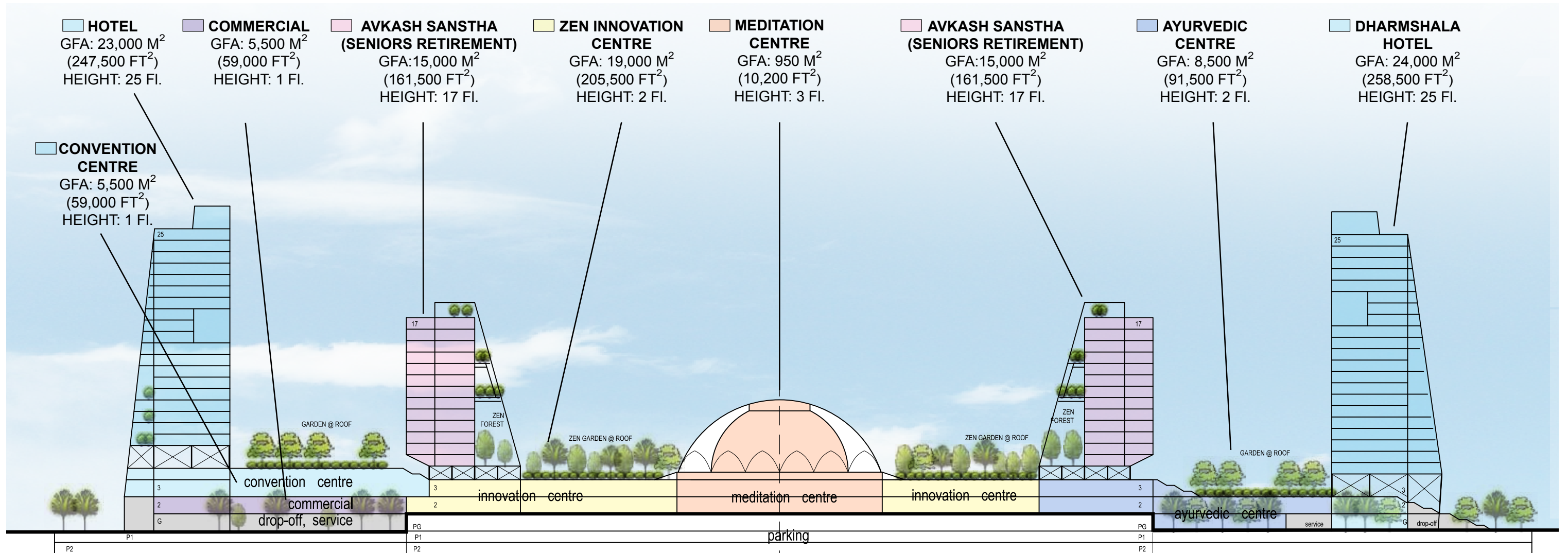


c) Proposed Site Plan





## d) Proposed Site Section



**TOTAL DEVELOPMENT: 115,500 M<sup>2</sup> (1,243,000 FT<sup>2</sup>)**



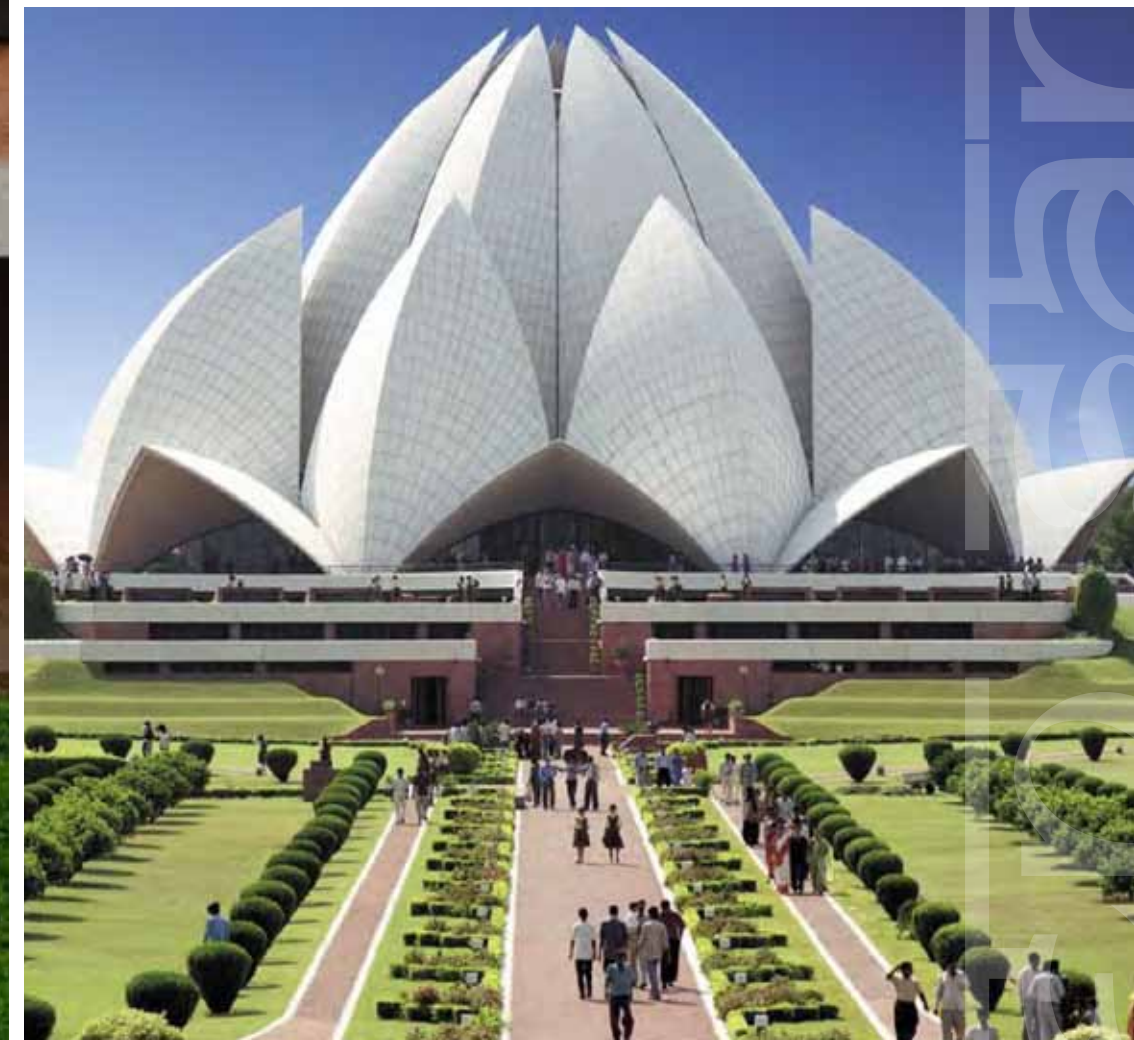


## e) Precedents - Built Form





## f) Precedents - Meditation Centre





**g) Precedents - Building Facades**









# 5 EMPLOYMENT





189 Milner Avenue (the site), located within the Scarborough 401 Corridor Employment District and consists of two vacant industrial buildings on 8.25 acres. There is currently no employment on site. IBI Group, in order to understand the impact of the proposed development on the site in terms of City employment, has projected employment yields based on the proposed size and uses. A range of employment densities were established for each proposed use on the site and employment yields were calculated. The current proposed uses constitute an employment land conversion from the site's Official Plan designation of Employment Area (Core Employment in the Draft Official Plan policy) to Mixed Use.

The City of Toronto's Official Plan states that Employment Districts "will be protected and promoted exclusively for economic activity." (OP 2.2.4) The City does not have explicit policies for addressing conversion requests in their Official Plan, but during the concurrent Official Plan Review and the Municipal Comprehensive Review (MCR), the City has adopted an approach which reflects the Province's criteria for conversions. From the August 27 2012 Staff Report, conversions are to be evaluated as a part of the MCR, using Growth Plan criteria. One of the questions to be answered, in the case of employment land conversions is:

Will the City meet the employment forecast in the Growth Plan, and are they (the lands) needed in the long term?<sup>1</sup>

The site, if permitted to redevelop to the density and uses proposed, will assist the City in meeting growth forecasts by accommodating significantly more employment that could be accommodated on the site if kept within its current designation.

**It is estimated that the proposed development could supply between 500 and 700 new jobs.**

<sup>1</sup>City of Toronto(2012) Staff Report: Official Plan Review: Employment Uses Policies Pg12066, August 27, 2012



## a) City of Toronto Employment Densities

The City of Toronto's 2013 Development Charges Background Study was used to establish Office, Retail and Commercial employment densities. (See Figure 1) These densities represent future densities for new construction, and do not reflect current densities occurring on existing employment lands. These multipliers are used by the City in their land use analysis, and are based on a floor space per worker approach.

**Figure 1 - 2013 DC Background Study New Employee Densities**

	Office	Retail	Other Commercial	Industrial	Institutional
<b>Floor Space per Worker (SM)</b>	27	40	40	75	60
<b>Floor Space per Worker (SF)</b>	290	430	430	807	645

Source: Table 10 (Employees in New Space 2013 to 2022) Hemson Consulting Forecast New Construction of Space and Employees. City of Toronto DC Background Study.

For this analysis, a range of employees per square foot was created using the Background Study numbers at the basis. The range allows for low, medium and high employment projection.

## b) Proposed Development

The proposed mixed-use development will have a significant employment component. In total the development is projected to have a total Gross Floor Area (GFA) of over 1,200,000 square feet. There are several different uses that will make up this development. Figure 2 indicates the uses and their projected areas.

**Figure 2 - Proposed Development Area by Use**

Use	SF	SM
Commercial	59,000	5,500
Hotel	247,500	23,000
Convention Centre	59,000	5,500
Senior's Retirement Facility	161,500	15,000
Zen Innovation Centre	205,500	19,000
Meditation Centre	10,200	950
Senior's Retirement Institute	161,500	15,000
Ayurevic Centre	91,500	8,500
Dharmshala Hotel	258,500	24,000
<b>TOTAL</b>	<b>1,254,500</b>	<b>116,450</b>

Some of the uses in the proposed development are not addressed in the DC Background Study, IBI Group therefore sought out industry professionals in order to establish a potential range of employees for use and area. In the case of the Hotels and the Seniors Retirement Facility, employment densities were applied per room, rather than per square foot, the method employed in the Background Study.

Additionally, the proposed development has a number of unique employment uses which were excluded from the initial calculation. These uses are undocumented in the current research or immediate geography, and the large scale of the uses made applying an employee range difficult to establish with certainty.

Using the density ranges available from the DC Background Study and those gleaned from Industry Experts, the initial analysis demonstrates a possible range of 386 to 596 employees.

(See Figure 3)



**Figure 3 - Proposed Uses and Employment Yields**

<b>Commercial (SQ FT)</b>		59,000
Scenario A - 400 SQ FT per Employee	148	
Scenario B - 450 SQ FT per Employee	131	
Scenario C - 500 SQ FT per Employee	118	
<b>Hotel (Rooms/SQ FT)</b>		247,500
Scenario A - 1 Employee per 2 Rooms	175	
Scenario B - 1 Employee per 3 Rooms	117	
Scenario C - 1 Employee per 4 Rooms	88	
<b>Dharmshala Hotel (Rooms/SQ FT)</b>		258,500
Scenario A - 1 Employee per 15 Rooms	22	
Scenario B - 1 Employee per 20 Rooms	17	
Scenario C - 1 Employee per 25 Rooms	13	
<b>Convention Centre (SQ FT)</b>		59,000
Scenario A - 450 SQ FT per Employee	131	
Scenario B - 500 SQ FT per Employee	118	
Scenario C - 550 SQ FT per Employee	107	
<b>Senior Retirement Institute (Rooms/SQ FT)</b>		323,000
Scenario A - 1 Employee per 5 Rooms	120	
Scenario B - 1 Employee per 7.5 Rooms	80	
Scenario C - 1 Employee per 10 Rooms	60	
<b>JOB CREATE ON SITE</b>		
SCENARIO A	596	
SCENARIO B	462	
SCENARIO C	386	

Those uses excluded from the initial employment yields included over 300,000 sf of GFA.

Omitted from the original estimate are the:

- Zen Innovation Centre (205,500 sf)
- Meditation Centre (10,200 sf)
- Ayurevic Centre (91,500 sf)

IBI Group has estimated that these uses will provide a minimum of 100 jobs, but as they are currently loosely defined, the estimate must be conservative in nature.

It is therefore estimated that the total proposed development will have an employment yield of between 486 and 696 jobs.

This is a significant number of jobs accommodated on the site, and is a density of 59 to 84 jobs per acre. This is much higher than the currently density provided on the majority of employment lands which area characterized by industrial type uses.



## c) Average Industrial Employment Densities

As a part of the Official Plan Review, and MCR, the City hired a consulting firm to review the City of Toronto's Employment Lands and Employment Land policies. The 2012 Malone Given Parsons et. al. (MGP) Report established, using the 2011 City-wide Employment Survey and Cushman & Wakefield's industrial building data base, that the average employment density in "industrial-type properties" is 14 jobs per acre (36 jobs per hectare). This is a blend of the many different users of industrial space. (See Figure 4)

**Figure 4 - Average Industrial Employment Densities (2011)**

Industrial-Type	Jobs Per Net Acre	Jobs Per Net Hectare
Manufacturing	16	40
Construction	12	30
Wholesale Trade	12	30
Transportation & Warehousing	8	20

Source: MGP Sustainable Competitive Advantage and Prosperity: Planning for Employment Uses in Toronto, October 2012

Based on the calculations and densities of the MGP Report, if 189 Milner Avenue was to develop with "typical industrial uses", based on the size of the site, average industrial lot coverage and the average density of each type of job, **a range of 66 to 134 jobs is estimated.**

**Figure 5 - Milner Industrial Employment Yield Estimate**

	Ac	Ha
Site Size	8.25	3.34
Job Estimate	Jobs (ac)	Jobs (ha)
Manufacturing	132	134
Construction	99	100
Wholesale Trade	99	100
Transportation & Warehousing	66	67

This is significantly less employment than the estimated employment yields of the proposed mixed-use development on the same site. The site has been vacant for a number of years, not accommodating employment, and the previous owners were unable to find a suitable industrial tenant. The site's configuration and access issues lessen its appeal to traditional employment land users. Additionally, to the south of the site, a formally vacant industrial piece of land has been converted to self-storage, which is estimated to have a significantly lower employment density than warehousing or logistics.

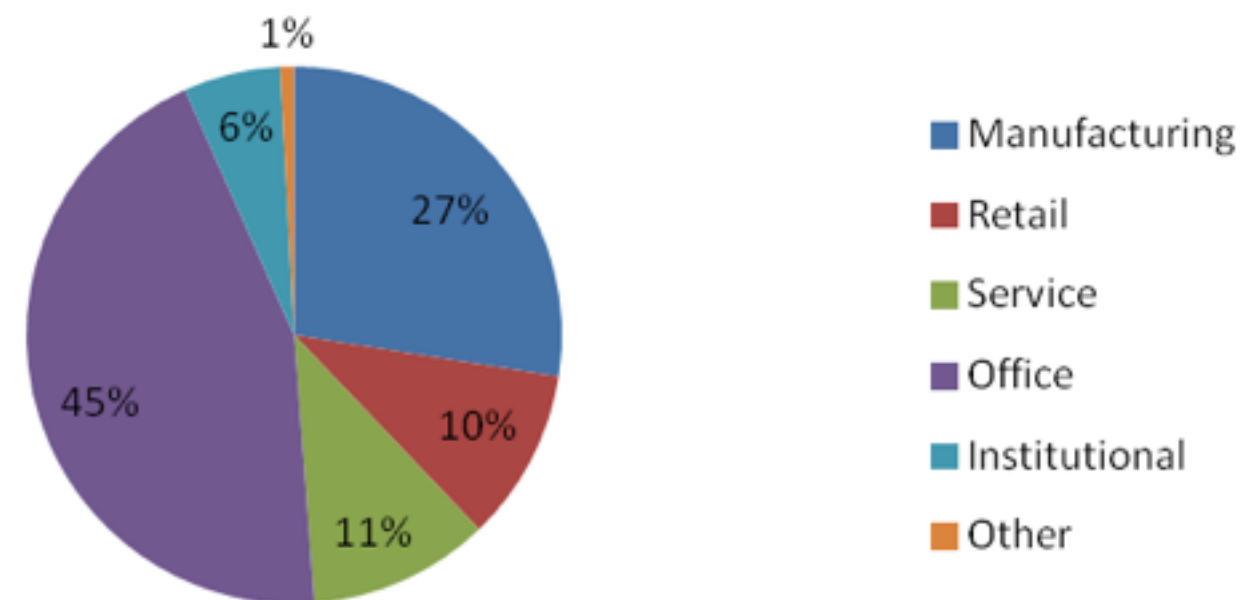
## d) Scarborough 401 Corridor Employment District Employment Densities

**Figure 6 - Scarborough 401 Corridor Employment District**



The 2011 Employment Survey<sup>2</sup> indicated that there were 16,669 jobs within the Employment District. Almost half of those jobs are Office jobs (45%) with Manufacturing (or Industrial) jobs representing 27% of the total Employment District Jobs.

**Figure 7 - 2011 Scarborough 401 Corridor Employment District Sector Breakdown**



<sup>2</sup>The current 2012 Survey has similar results.



According to the MGP Report, as of 2011, the Employment District, containing 189 Milner Avenue, had an total area of 289 net hectares and just under 7,000,000 square feet of Industrial space, with an average vacancy rate of 5%. This results in an overall employment density of 58 jobs per net hectare, which is not surprising considering the prevalence of Office uses in the Employment District.

Using the MGP and City employment numbers we can establish that employment densities (per square foot) in industrial buildings measures approximately 1 employee per 900 square feet. (see Figure 8)

**Figure 8 - Employment in Industrial Space**

	Manufacturing	Retail	Service	Office	Institutional	Other	TOTAL
2011 Employment	4,579	1,736	1,820	7,423	972	139	16,669
% In Industrial Space	100%	15%	10%	30%	15%	5%	
	4,579	260	182	2,227	146	7	7,401
				Industrial Space Employment			7,401
				Employees per Industrial sf			897
				Employees per ha (overall)			58

This number is slightly higher than the 2013 DC Background study which was looking at new or future construction. In addition considering the age and location of industrial buildings in the Employment District, it is still not as high as some logistics uses. It is unlikely that any industrial type buildings would create any higher employment yields (based on employees per sf) that which already exist in the area.

Considering the site, using the 40% coverage ratio used in the MGP Report, and a range of employment densities based on those demonstrated in the Employment District, and the DC Background Study:

**The total site, if it were to be development today for industrial-type uses would only have a potential employment yield of between 160 and 178 jobs.**

**Figure 9 - 189 Milner Density with Typical Industrial Employment**

Site Size (ac)	8.25
Lot Coverage	40%
Total Industrial Space (sf)	143,750
Jobs 1 employee per 807 sf	178
Jobs 1 employee per 897 sf	160

## e) Summary


The proposed development, even in the most conservative analysis, will provide almost over 200 more jobs on the site that projected employment densities presented by the City and their Consultant and almost 400 more jobs that are currently occurring on the site. In this case, the conversion to mixed use will assist the City in meeting the employment forecast, by taking a site which currently has no jobs, and providing a minimum of approximately 400 jobs, based on the City and Industry Expert's projected employment densities.

**Figure 10 - Proposed and Typical Industrial Range of Employment Yields**

	Low	High
<b>Proposed Mixed Use Development (Partial)</b>	386	596
<b>Proposed Mixed Use Development (Full)</b>	486	696
<b>MGP Report - Typical Industrial Employment (employment per acre)</b>	66	134
<b>MGP Report &amp; DC Background - Typical Industrial Employment (per sf)</b>	160	178







# **6 PRELIMINARY TRAFFIC ANALYSIS**



## a) Site Access

The site at 189 Milner Avenue in Scarborough is easily accessible from existing roadways.

- Access from points south will be provided via Markham Road and Progress Road with additional demand from the Highway 401 interchange at Markham Road;
- Access from points north will be provided via Markham Road at the Milner Avenue intersection;
- Access from points east and west of the site will be provided primarily by Highway 401 at the Markham Road interchange with some additional volume along Milner Road.

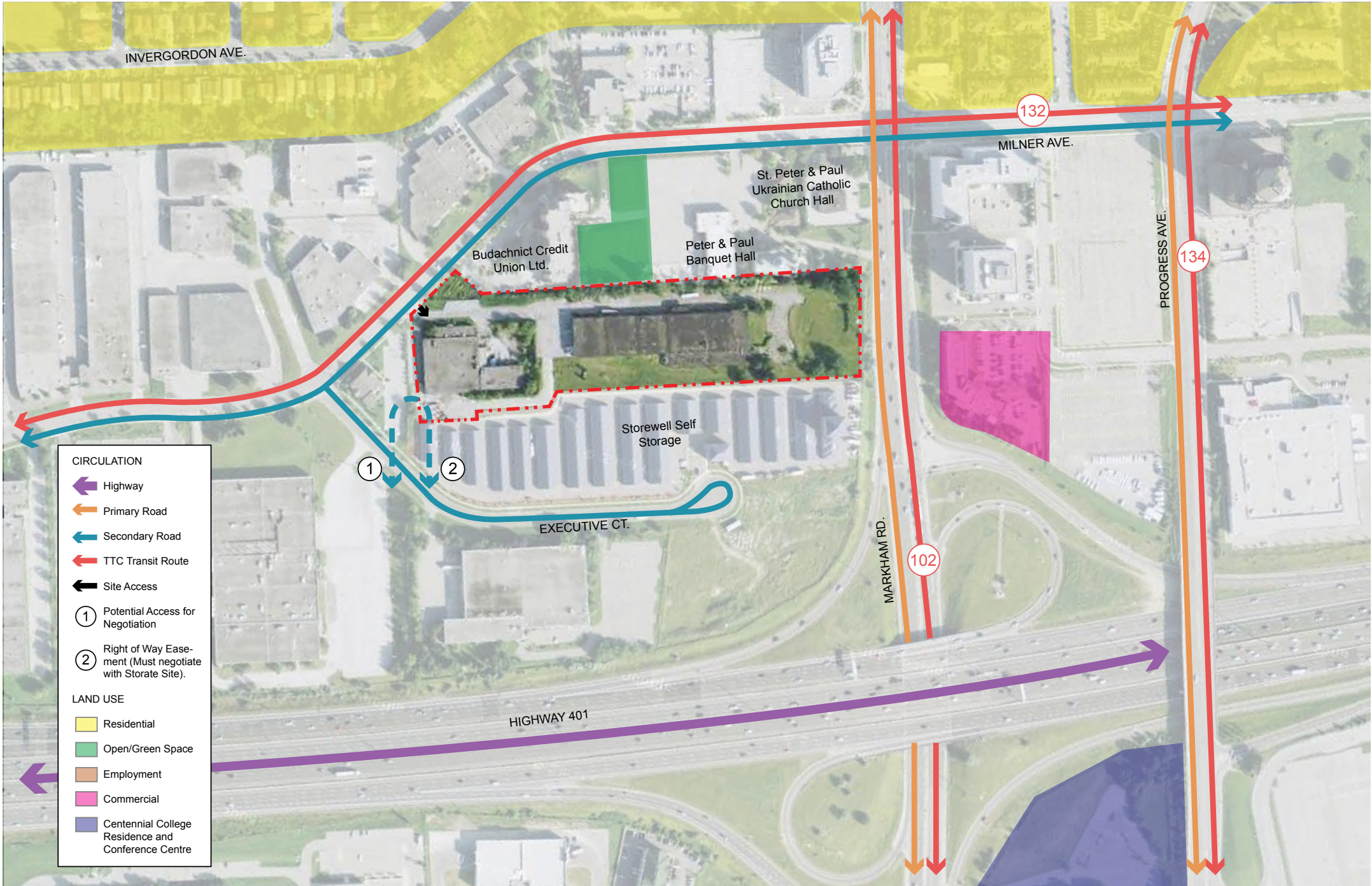
Given its location, the site at 189 Milner Avenue is also well serviced by public transit. Currently, TTC maintains two routes in the vicinity of the site. The TTC 132 Markham Bus runs east/west along Milner, servicing the site near Executive Court, while the TTC 134 Progress Bus runs east/west in the area around McCowan and the Scarborough Town Center where transfers can be made to/from the SRT. Current ridership estimates for these routes range from 2200 to 8100 customers per weekday for the TTC 132 and TTC 134 Bus, respectively.

Direct access to the site is provided via a driveway just east of Executive Court. Potential access is also being considered to Executive Court just south of the Milner Avenue intersection. An emergency access is also being considered on the east end of the site with controlled access from Markham Road (Right-In Only) to facilitate access for emergency services.



# b) On Site Circulation

The main access to the site is provided via a driveway just east of Executive Court along Milner Avenue. Vehicles enter the site and head east with various internal access driveways provided with right-in movements which reduces inbound site congestion. Internal site driveways provide access to all points of the site in both clockwise and counterclockwise directions. Vehicles exit at the Milner Avenue driveway access. Given the site layout, providing access via counterclockwise direction only may also be possible.





## c) Road and Intersection Impacts

Given the proposed uses of the site, it is understood that the City of Toronto will require a Traffic Impact Study to be submitted which indicates the potential impacts of the site as they pertain to traffic and congestion on the nearby roadway network. To that end, a preliminary study area including signalized intersections has been identified for further consideration once an acceptable Terms of Reference document guiding the traffic impact study has been submitted to and approved by the City:

- Markham Road / Milner Avenue
- Markham Road / Sheppard Avenue
- Markham Road at Highway 401 Westbound Off Ramp
- Markham Road at Highway 401 Eastbound Off Ramp
- Markham Road at Progress Avenue
- Markham Road at Centennial College Driveway
- Milner Avenue at Progress Avenue
- Milner Avenue at Scunthorpe Road (unsignalized)
- Milner Avenue at Executive Court (unsignalized); and,
- Milner Avenue at McCowan Road.

It is at these locations where potential traffic impacts of the site are most likely to be experienced. The study area, once established, will be evaluated under the new traffic impact study criteria as detailed in the “Guidelines for the Preparation of Transportation Impact Studies – 2013” published by the City of Toronto. Areas under MTO influence will also be evaluated based on current MTO guidelines and direction.

## d) Proposed Road and Traffic Operations Improvements

Given the diversity of land uses at the site, a number of trip generation schemes could be envisioned, and these will be identified through the study process in collaboration with City staff. The site trips combined with the future background traffic volumes will provide future year scenarios for analysis where the need for improvements can be best determined. City of Toronto traffic data suggests that Milner Avenue in the area of the proposed site access driveway currently experiences 7221 vehicles per day westbound and 6754 vehicles per day eastbound between McCowan Road and Markham Road. These volumes combined with the site volumes accessing the proposed driveway on Milner Avenue may warrant the need for some improvements to the driveway intersection, such as the provision of a signal should it meet warrants as identified in the Ontario Traffic Manual.

Given the maturity of the area and the infrastructure currently in place, major improvements such as roadway or bridge widening are not anticipated. Transportation Demand Management strategies will be implemented to the extent feasible to manage potential impacts. A Traffic Management Plan will be developed which identifies the traffic demands associated with normal use as well as anticipated traffic during events and the operations plan to contain queuing on the site internal roadways and not on City of Toronto roadways. Safety for all road users will drive recommendations for improvements to internal roadways as well as along City facilities serving the site.





# **7 PRELIMINARY SERVICING ANALYSIS**



## a) Sanitary Sewer System

Two local City sanitary sewer systems exist at the road frontages of the site. Both sewer systems outlet to the existing 1050mm diameter East Highland Creek sanitary trunk sewer that follows the East Highland Creek river valley. The local sewer systems comprise the following:

- A 250mm diameter sanitary sewer along Milner Avenue that drains west to the East Highland Creek trunk sewer located approximately 995m from the site
- A 250mm diameter sanitary sewer along Markham Road that drains south to the East Highland Creek trunk sewer (near Progress Avenue) located approximately 825m from the site

A preliminary analysis was undertaken of both existing sanitary sewer systems to review potential available surplus capacity for additional development.

An average water consumption rate of 450 Litres/capita/day is assumed in this analysis as per normal City design criteria.

We note that the City may permit the use of a lesser average per capita daily water consumption rate for analysis of existing wastewater flows as noted below where sewer networks are fully separated storm and sanitary sewer areas, where no downspout and foundation drains are connected to the sanitary sewer and where inflow and infiltration has been established by the a city sponsored study:

- 240 litres/capita/day—residential
- 250 litres/capita/day—industrial/commercial/institutional

Consequently, application of the above reduced design criteria for analysis of the proposed development is subject to City approval. Nevertheless, this reduced was also considered using 250 litres/capita/day for all uses for this preliminary assessment, including residential.

Dwg. No. DR-03A shows the existing sanitary sewer network along Milner Avenue and Markham Road and the existing contributing development areas to each sewer system.

## Existing Condition

Table 1.1 provides a preliminary analysis of existing sanitary flows along the Milner Avenue sanitary sewers under existing conditions, excluding the proposed development. Table 2.1 provides a preliminary analysis of existing sanitary flows along the Markham Road sanitary sewers under existing conditions, excluding the proposed development.

As indicated, approximately 824m of existing sanitary sewer is theoretically undersized on Milner Avenue to provide for existing development and approximately 528m of existing sanitary sewer is theoretically undersized along Markham Road to provide for existing development when the standard 450 Litres/capita/day average water consumption rate is applied.

For comparison, Tables 2A and 2B apply the reduced 250 Litres/capita/day water consumption rate. In this case, approximately 672m of existing sanitary sewer is theoretically undersized on Milner Avenue to provide for existing development and approximately 0m of existing sanitary sewer is theoretically undersized along Markham Road to provide for existing development.

## Proposed Condition

Since the existing sewers are theoretically deficient to provide for existing development, it is expected that sanitary sewer system improvements would be necessary to the City sewer network to accommodate any proposed additional development.

The proposed development is expected to generate the following equivalent site population based on proposed development floor space and City of Toronto sanitary sewer design criteria:

Building	Gross Floor Area (GFA) (sq.m)	Design Criteria	Equivalent Population (persons)
Hotel	23,000	1 person/bed; 1 bed/30m <sup>2</sup> GFA	766
Convention Centre	5,500	1.1 person/100m <sup>2</sup> GFA	60
Commercial Space	5,500	1.1 person/100m <sup>2</sup> GFA	60
Seniors Retirement Facility	15,000	1 person/bed; 1 bed/30m <sup>2</sup> GFA	500
Zen Innovation Centre (Retail/Commercial)	19,000	1.1 person/100m <sup>2</sup> GFA	209
Mediation Centre	950	0.0258 person/m <sup>2</sup> GFA	25
Seniors Retirement Facility	15,000	1 person/bed; 1 bed/30m <sup>2</sup> GFA	500
Ayurvedic Centre	8,500	0.0258 person/m <sup>2</sup> GFA	219
Dharmshala Hotel	24,000	1 person/bed; 1 bed/30m <sup>2</sup> GFA	800
<b>TOTALS</b>	<b>116,450</b>		<b>3,139</b>

For the purpose of this preliminary analysis, it is assumed that the entire development forms one block of land under single ownership. Both the existing Milner Avenue and the Markham Road sanitary sewer systems were assessed separately to accommodate the proposed entire development, given the City's practice is to provide one sanitary service connection for each separate blocks of land ownership.



Table 1.3 provides a preliminary analysis of proposed sanitary flows along the Milner Avenue sanitary sewer with the entire proposed development when the standard 450 Litres/capita/day average water consumption rate is applied. Table 2.3 provides a preliminary analysis of the proposed sanitary flows along the Markham Road sanitary sewer with the entire proposed development when the standard 450 Litres/capita/day average water consumption rate is applied.

As indicated, approximately 995m of existing sanitary sewer is theoretically undersized on Milner Avenue if the entire proposed development is serviced to the Milner Avenue sanitary sewer. Approximately 825m of existing sanitary sewer is undersized along Markham Road if the entire proposed development is serviced to the Markham Road sanitary sewer.

For comparison, Tables 1.4 and 2.4 apply the reduced 250 Litres/capita/day water consumption rate along Milner Avenue and Markham Road respectively. In this case, approximately 763m of existing sanitary sewer is theoretically undersized on Milner Avenue and approximately 242m of existing sanitary sewer is undersized along Markham Road to provide for the existing and proposed development.

Based on the above preliminary analysis, it is expected that sanitary sewer system improvements would be required to the Milner Avenue or Markham Road existing sanitary sewers, depending on which sewer system is selected to service the site regardless of whether the normal or reduced average water consumption rate is applied. However, given the extent of sewers that are noted as theoretically undersized, and given that these sewer systems are operating with no regular apparent issues, sanitary sewer flow monitoring is recommended to confirm actual sewage flows for comparison against theoretical flows. It may be that theoretical flows based on the current City design criteria over-estimates actual sewage flows in these sewer systems. Therefore, sanitary sewer flow monitoring is recommended to confirm the need for existing sewer system upgrades.

Where City sewer network improvements are proposed to accommodate additional development, proponents should consider cost sharing arrangements with the City since the improvements would also benefit existing development, given the existing sewers are theoretically deficient to provide for existing development when the standard 450 Litres/capita/day average water consumption rate is applied.

Servicing the portions of the proposed development to the Milner Avenue and Markham Road sanitary sewer systems is also possible, subject to City approval. Servicing to both sewer systems may allow for better optimization of existing sewer capacity, particularly if the development is phased.

**TABLE 1.1 : MILNER AVENUE SEWER**  
SANTITARY SEWER DESIGN SHEET  
Project: 189 Milner Ave. Toronto

**EXISTING CONDITION @ 450L/capita/day**

IBI Group  
230 Richmond St. W.  
Toronto, Ontario  
M5V 1V6  
Phone: (416) 596-1500

TORONTO DESIGN CRITERIA: EQUIVALENT POPULATIONS

Type 1: Medium Density	270	persons
Type 2: Apartments	400	persons
Type 3: Industrial	136	persons
Type 4: retirement homes/hotels (note 1)	0.0333	(persons/GFA)
Type 5: Commercial/retail (note 2)	0.0110	(persons/GFA)
Type 6: Church	0.0258	(persons/GFA)

Manning's "n" 0.013  
Infiltration (l/s/m) 0.260  
Peaking Factor as per Harmon formula.  
Average Water Consumption (l/day) 450

Note 1: 1 person/bed \* 1bed/50m²(GFA) = 0.0333 (persons/GFA)  
Note 2: 1.1 person/100m²(GFA) = 0.0110 (persons/GFA)

FROM MH	TO MH	L (m)	AREA (Ha)	PROPOSED DEVELOPMENT						Sum Pop. (persons)	Res. Peak Factor (persons)	Peak San. Flow (L/s)	SUM OF AREA (Ha)	Infiltration (L/s)	PROPOSED SEWER DESIGN									
				Type 1 (Ha)	Type 2 (Ha)	Type 3 (Ha)	Type 4 Tot. GFA (m²)	Type 5 Tot. GFA (m²)	Type 6 Tot. GFA (m²)						Design Flow (L/s)	Pipe Dia. (mm)	Pipe Slope (m/m)	Pipe Capacity (L/s)	Full Flow Velocity (m/s)	Actual Velocity (m/s)	% Full Capacity			
MH14A			1.01			1.01				137	4.20	3.0	1.01	0.3	3.3									
	MH13A	55.8	0.14		0.57					365	4.04	7.7	1.58	0.4	8.1									
MH13A	MH12A	46.7	0.12							365	4.04	7.7	1.72	0.4	8.1	250	2.54%	94.8	1.93	2.2			9%	
MH12A			1.31			1.31				544	3.96	11.2	3.15	0.8	12.0	250	1.63%	75.9	1.55	1.8			11%	
	MH11A	77.3	0.19							544	3.96	11.2	3.34	0.9	12.1	250	0.71%	50.1	1.02	1.2			24%	
MH11A			0.81		0.81					968	3.84	17.3	4.15	1.1	18.4									
			3.34			3.34				1322	3.72	25.6	7.49	1.9	27.5									
	MH10C	15	0.04							1322	3.72	25.6	7.53	2.0	27.6	250	0.54%	43.7	0.89	1.0			63%	
MH10C	MH10B	88	0.22							1322	3.72	25.6	7.75	2.0	27.6	250	0.60%	46.1	0.94	1.1			60%	
MH10B	MH10A	15	0.04							1322	3.72	25.6	7.78	2.0	27.6	250	1.27%	67.0	1.37	1.6			41%	
MH10A	MH9A	53	0.13							1322	3.72	25.6	7.92	2.1	27.7	250	0.99%	59.2	1.21	1.4			47%	
MH9A			26.29	22.21		4.08				7873	3.06	125.4	34.21	8.9	134.3									
			0.31			0.31				7916	3.05	125.9	34.52	9.0	134.9									
			7.70			7.70				8963	3.00	140.1	42.22	11.0	151.1									
	MH8A	50	0.13							8963	3.00	140.1	42.34	11.0	151.1	300	0.66%	78.6	1.11	surcharge			192%	
MH8A			4.05			4.05				9514	2.98	147.5	46.39	12.1	159.5									
	MH7A	91	0.23							9514	2.98	147.5	46.62	12.1	159.6	300	0.51%	69.1	0.98	surcharge			231%	
MH7A			2.59			2.59				9866	2.96	152.1	49.21	12.8	164.9									
			2.59			2.59				10218	2.95	156.7	51.80	13.5	170.2									
	MH6A	91	0.23							10218	2.95	156.7	52.03	13.5	170.3	375	0.40%	110.9	1.00	surcharge			154%	
MH6A			2.21			2.21				10519	2.93	160.7	54.24	14.1	174.8									
	MH5A	91	0.23							10519	2.93	160.7	54.46	14.2	174.8	375	0.24%	85.9	0.78	surcharge			204%	
MH5A			1.70			1.70				10750	2.92	163.7	56.16	14.6	178.3									
			0.53			0.53				10822	2.92	164.6	56.69	14.7	179.4									
	MH4A	91	0.23							10822	2.92	164.6	56.92	14.8	179.4	375	0.36%	105.2	0.95	surcharge			171%	
MH4A			1.77			1.77				11063	2.91	167.7	58.69	15.3	183.0									
			1.53			1.53				11271	2.90	170.4	60.22	15.7	186.1									
			1.11			1.11				11422	2.90	172.3	61.33	15.9	188.3									
	MH3A	159	0.40							11422	2.90	172.3	61.73	16.0	188.4	375	0.32%	99.2	0.90	surcharge			190%	
MH3A			0.96			0.96				11552	2.89	174.0	62.69	16.3	190.3									
	MH2A	91	0.23							11552	2.89	174.0	62.92	16.4	190.4	375	0.38%	108.1	0.98	surcharge			176%	
MH2A			1.38			1.38				11740	2.89	176.4	64.30	16.7	193.1									
			2.35			2.35				12059	2.87	180.5	66.65	17.3	197.8									
	MH1A	99	0.25							12059	2.87	180.5	66.89	17.4	197.9	375	0.31%	97.6	0.88	surcharge			203%	
MH1A	TRUNK	61	0.15							12059	2.87	180.5	67.05	17.4	197.9	450	0.25%	142.6	0.90	surcharge			139%	
CHECK:			67.05	22	1	41	0	0	12059			67.05												



**TABLE 1.2 : MILNER AVENUE SEWER**

SANITARY SEWER DESIGN SHEET

Project: 189 Milner Ave. Toronto

**EXISTING CONDITION @ 250L/capita/day**

IBI Group  
230 Richmond St. W.  
Toronto, Ontario  
MSV 1V6  
Phone: (416) 595-1900

TORONTO DESIGN CRITERIA: EQUIVALENT POPULATIONS			
Type 1: Medium Density	270		persons/ha
Type 2: Apartments	400		persons/ha
Type 3: Industrial	138		persons/ha
Type 4: retirement home/hotel (note 1)	0.0333		(persons/GFA)
Type 5: Commercial/hotel (note 2)	0.0110		(persons/GFA)
Type 6: Church	0.0258		(persons/GFA)

Manning's 'n'	0.013
Infiltration (l/sec/ha)	0.260
Padding Factor as per Harmon formula.	
Average Water Consumption (litres/day)	250

Note 1: 1 person/bed \* 1bed/30m2(GFA) = 0.0333 (persons/GFA)  
Note 2: 1.1 person/100m2(GFA) = 0.0110 (persons/GFA)

FROM MH	TO MH	L (m)	AREA (ha)	PROPOSED DEVELOPMENT						Sum Pop. (persons)	Res. Peak Factor (persons)	Peak San. Flow (L/s)	SUM OF AREA (ha)	Infiltration (L/s)	PROPOSED SEWER DESIGN						% Full Capacity	
				Type 1 (ha)	Type 2 (ha)	Type 3 (ha)	Type 4 (ha)	Type 5 (ha)	Type 6 (ha)						Design Flow (L/s)	Pipe Dia. (mm)	Pipe Slope (1%)	Pipe Capacity (L/s)	Full Flow Velocity (m/s)	Actual Velocity (m/s)		
MH14A		1.01			1.01				137	4.20	1.7	1.01	0.3	1.9								
	MH13A	55.8	0.14		0.57				365	4.04	4.3	1.58	0.4	4.7								
	MH12A	46.7	0.12						365	4.04	4.3	1.72	0.4	4.7	250	2.54%	94.8	1.93	2.2		5%	
	MH12A		1.31						365	4.04	4.3	1.84	0.5	4.7	250	1.63%	75.9	1.55	1.8		6%	
	MH11A	77.3	0.19						544	3.96	6.2	3.15	0.8	7.0								
	MH11A		0.81		0.81				544	3.96	6.2	3.34	0.9	7.1	250	0.71%	50.1	1.02	1.2		14%	
	MH11A		3.34						868	3.84	9.6	4.15	1.1	10.7								
	MH10C	15	0.04						1322	3.72	14.2	7.49	1.9	16.2								
	MH10B	88	0.22						1322	3.72	14.2	7.53	2.0	16.2	250	0.54%	43.7	0.89	1.0		37%	
	MH10A	15	0.04						1322	3.72	14.2	7.75	2.0	16.2	250	0.60%	46.1	0.94	1.1		35%	
	MH8A	53	0.13						1322	3.72	14.2	7.78	2.0	16.2	250	1.27%	67.0	1.37	1.6		24%	
	MH8A		26.29	22.21					1322	3.72	14.2	7.92	2.1	16.3	250	0.99%	59.2	1.21	1.4		28%	
	MH8A		0.31						7873	3.06	69.6	34.21	8.9	78.5								
	MH8A		7.70						7916	3.05	70.0	34.52	9.0	78.9								
	MH8A		50	0.13					8963	3.00	77.8	42.22	11.0	88.8								
	MH7A	91	0.23						9514	2.98	81.9	46.39	12.1	94.0								
	MH7A		2.59						9514	2.98	81.9	46.62	12.1	94.0	300	0.51%	69.1	0.98			surcharge	136%
	MH6A	91	0.23						9866	2.96	84.5	49.21	12.8	97.3								
	MH6A		2.59						10218	2.95	87.1	51.80	13.5	100.6								
	MH6A		91	0.23					10218	2.95	87.1	52.03	13.5	100.6	375	0.40%	110.9	1.00	1.0		91%	
	MH5A	91	0.23						10519	2.93	89.3	54.24	14.1	103.4								
	MH5A		1.70						10519	2.93	89.3	54.46	14.2	103.4	375	0.24%	85.9	0.78			surcharge	120%
	MH4A	91	0.23						10750	2.92	90.9	56.16	14.6	105.5								
	MH4A		0.53						10822	2.92	91.5	56.69	14.7	106.2								
	MH4A		1.77						11063	2.91	93.2	58.89	15.3	108.4								
	MH3A	159	0.40						11271	2.90	94.7	60.22	15.7	110.3								
	MH3A		1.11						11422	2.90	95.7	61.33	15.9	111.7								
	MH2A	91	0.23						11422	2.90	95.7	61.73	16.0	111.8	375	0.32%	99.2	0.90			surcharge	113%
	MH2A		1.38						11552	2.89	96.7	62.69	16.3	113.0								
	MH2A		2.35						11740	2.89	98.0	64.30	16.7	114.7								
	MH1A	99	0.25						12059	2.87	100.3	66.65	17.3	117.6								
	MH1A		0.15						12059	2.87	100.3	66.89	17.4	117.7	375	0.31%	97.6	0.88			surcharge	121%
	MH1A								12059	2.87	100.3	67.05	17.4	117.7	450	0.25%	142.6	0.90				83%
CHECK:			67.05	22	1	41	0	0	12059			67.05										

**TABLE 1.3 : MILNER AVENUE SEWER**

SANITARY SEWER DESIGN SHEET

Project: 189 Milner Ave. Toronto

**PROPOSED CONDITION @ 450L/capita/day**

IBI Group  
230 Richmond St. W.  
Toronto, Ontario  
MSV 1V6  
Phone: (416) 595-1900

TORONTO DESIGN CRITERIA: EQUIVALENT POPULATIONS			
Type 1: Medium Density	270		persons/ha
Type 2: Apartments	400		persons/ha
Type 3: Industrial	138		persons/ha
Type 4: retirement home/hotel (note 1)	0.0333		(persons/GFA)
Type 5: Commercial/hotel (note 2)	0.0110		(persons/GFA)
Type 6: Church	0.0258		(persons/GFA)

Manning's 'n'	0.013
Infiltration (l/sec/ha)	0.260
Padding Factor as per Harmon formula.	
Average Water Consumption (litres/day)	450

Note 1: 1 person/bed \* 1bed/30m2(GFA) = 0.0333 (persons/GFA)  
Note 2: 1.1 person/100m2(GFA) = 0.0110 (persons/GFA)

FROM MH	TO MH	L (m)	AREA (ha)	PROPOSED DEVELOPMENT						Sum Pop. (persons)	Res. Peak Factor (persons)	Peak San. Flow (L/s)	SUM OF AREA (ha)	Infiltration (L/s)	PROPOSED SEWER DESIGN						% Full Capacity		
				Type 1 (ha)	Type 2 (ha)	Type 3 (ha)	Type 4 (ha)	Type 5 (ha)	Type 6 (ha)						Design Flow (L/s)	Pipe Dia. (mm)	Pipe Slope (1%)	Pipe Capacity (L/s)	Full Flow Velocity (m/s)	Actual Velocity (m/s)			
MH14A		1.01				1.01				137	4.20	3.0	1.01	0.3	3.3								
	MH13A	55.8	0.14			0.57				365	4.04	7.7	1.58	0.4	8.1								
	MH12A	46.7	0.12							365	4.04	7.7	1.72	0.4	8.1	250	2.54%	94.8	1.93	2.2		9%	
	MH12A		1.31							365	4.04	7.7	1.84	0.5	8.2	250	1.63%	75.9	1.55	1.8		11%	
	MH11A	77.3	0.19							544	3.96	11.2	3.34	0.9	12.1	250	0.71%	50.1	1.02	1.2		24%	
	MH11A		0.81			0.81				868	3.84	17.3	4.15	1.1	18.4								
	MH11A		3.34							1633	3.65	31.1	7.49	1.9	30.0								
	MH10C	15	0.04							1694	3.64	32.1	7.49	1.9	34.1								
	MH10B	88	0.22							1754	3.63	33.2	7.49	1.9	35.1								
	MH10A	15	0.04							2254	3.54	41.6	7.49	1.9	43.6								
	MH8A	53	0.13							2463	3.51	45.1	7.49	1.9	47.0								
	MH8A		26.29	22.21						2487	3.51	45.5	7.49	1.9	47.4								
	MH8A		0.31							2987	3.44	53.6	7.49	1.9	55.5								
	MH8A		7.70							3206	3.42	57.1	7.49	1.9	59.0								
	MH8A		50	0.13						4005	3.33	69.5	7.49	1.9	71.5								
	MH7A	91	0.23							4005	3.33	69.5	7.53	2.0	71.5	250	0.54%	43.7	0.89			surcharge	164%
	MH7A		2.59							4005	3.33	69.5	7.75	2.0	71.5	250	0.60%	46.1	0.94			surcharge	155%
	MH7A		2.59							4005	3.33	69.5	7.78	2.0	71.6	250	1.27%	67.0	1.37			surcharge	107%
	MH6A	91	0.23							4005	3.33	69.5	7.92	2.1	71.6	250	0.99%	59.2	1.21			surcharge	121%
	MH6A		2.59							10557	2.93	161.2	34.21	8.9	170.1								
	MH6A		91	0.23						10599	2.93	161.7	34.52	9.0	170.7								
	MH5A	91	0.23							11646	2.89	175.2	42.22	11.0	186.2								
	MH5A		1.70							11646	2.89	175.2	42.34	11.0	1								















## b) Storm Drainage and Storm Water Management

### Existing Condition

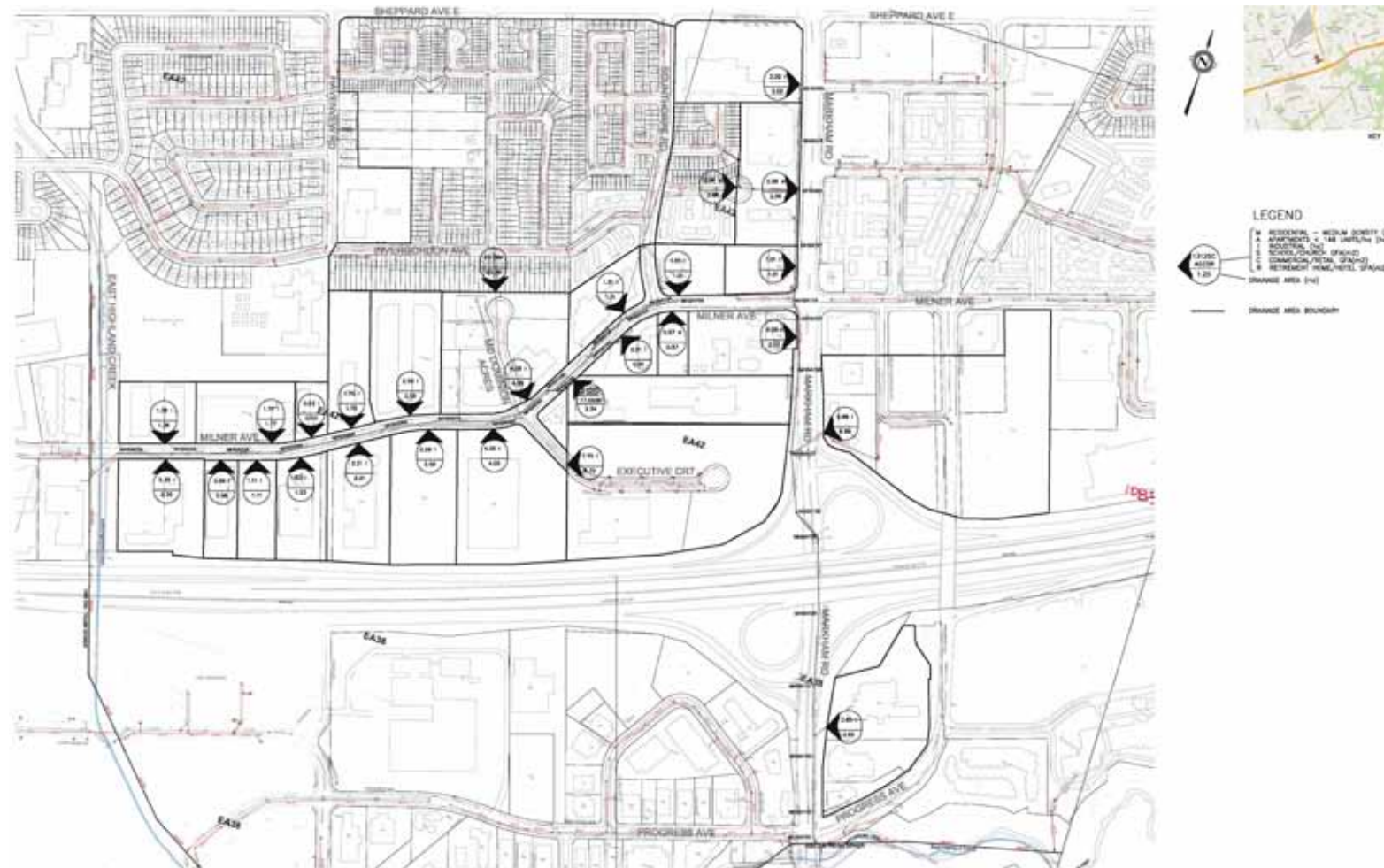
Municipal storm sewers exist across the Milner Avenue and Markham Road frontage of the site. These sewers include the following:

- A 825mm diameter storm sewer on Milner Avenue that drains west
- A 975mm diameter storm sewer on Markham Road that drains south
- A 600mm diameter storm sewer may extend into the site from Markham Road based on City records

City drainage records indicate that approximately 50% of the site area is allocated into the Milner Avenue storm sewer at a runoff coefficient of 0.75, with the balance of the site allocated to the Markham Road sewer, presumably with the same runoff coefficient of 0.75.

The existing site is partially covered by building roof and surface asphalt pavement. The existing site imperviousness is approximately 65%. The balance of the site generally comprises sod covered areas.

The site lies within the Highland Creek watershed.



### Proposed Condition

The proposed development will be subject to the City’s Green Roof By-Law and Wet Weather Flow Management Guidelines (WWFMG).

#### Green Roof By-law

The City of Toronto has a green roof by law which requires and governs the construction of green roofs on new development. It was adopted by Toronto City Council in May 2009, under the authority of Section 108 of the City of Toronto Act.

The section 492-2 of the bylaw states that the following green roofs are required:

- A Every building or building addition constructed after January 30, 2010 with a Gross Floor Area of 2,000 square metres or greater shall include a Green Roof with a coverage of Available Roof Space in accordance with the following chart:

Gross Floor Area (Size of Building)	Coverage of Available Roof Space (Size of Green Roof)
2,000 – 4,999 m <sup>2</sup>	20%
5,000 – 9,999 m <sup>2</sup>	30%
10,000 – 14,999 m <sup>2</sup>	40%
15,000 – 19,999 m <sup>2</sup>	50%
20,000 m <sup>2</sup> or greater	60%

Green roofs will be provided in the proposed development to meet the green roof by-law requirements.



## STORM WATER MANAGEMENT

The City's WWFMG emphasises a hierarchical approach to manage wet weather flows, with consideration of source controls first, conveyance controls second, and lastly end-of-pipe controls.

Various requirements of the WWFMG are noted below:

### WATER BALANCE

The City's WWFMG require new developments to provide a water balance. Where it is not possible to achieve a water balance, developments must retain the storm runoff from a 5mm rainfall and dispose this runoff volume onsite, as a minimum. This quantity of runoff must be disposed by methods other than discharging to the municipal sewer system such as, but not limited to, infiltration systems, evaporation, green roofs or rainwater reuse.

The runoff volume resulting from a 5mm storm, assuming 90% of the 33,400m<sup>2</sup> site area is impervious may be estimated as follows:

<b>Pervious site areas:</b>	<b>3,340m<sup>2</sup></b>
Rainfall from a 5mm storm, where 2mm of the storm is lost due to initial rainfall abstractions on pervious site areas (infiltration and depression storage):	0.003m
Total Runoff Volume from pervious areas resulting from the 5mm storm event:	10.0m <sup>3</sup>
<b>Impervious site areas:</b>	<b>30,060m<sup>2</sup></b>
Rainfall from a 5mm storm (no losses):	0.005m
Total Runoff Volume from impervious area resulting from the 5mm storm event:	150.3m <sup>3</sup>
Total runoff volume resulting from a 5mm storm	160.3m <sup>3</sup>

Thus, the first approximately 160m<sup>3</sup> of rainfall-runoff from every storm event must be disposed onsite. This may be achieved by combinations of green roofs, and various rainfall harvesting and re-use measures such as landscape irrigation and grey water plumbing.

### WATER QUALITY

The WWFMG require Level 1 water quality treatment for development site up to 5.0ha in area. Thus, Level 1 treatment is required for the subject development.

The subject site has no exterior surface vehicle parking areas or extensive private roads, where water quality contaminants are typically generated (primarily from vehicles) and accumulate, nor does the site discharge directly to any lake or waterfront area. The majority of the site is occupied by building structure and the roof areas of the development are deemed to generate clean water since they are exposed to the atmosphere only (no vehicles). Also, the land use does not pose a high risk for spills creating potential water quality impacts that are typically associated with industrial land uses (such as refuelling stations). Thus, the site is not expected to generate any significant water quality contaminants.

It is anticipated that water quality treatment will be required only for the at-grade private access drives within the site. Water quality treatment for these drives may be achieved by combinations of bioswale and oil-grit separator measures.

### WATER QUANTITY

As noted, the subject site lies within the Highland Creek watershed. According to the WWFMG, this watershed requires post to predevelopment control (not over control) for 2-year up to 100-year storm events. Thus, the proposed development requires that outflows from the site to city storm sewers be controlled.

The allowable release rate from the site to the municipal storm sewer system (minor system) during a 2-year design storm event will not exceed the peak runoff rate from the site under pre-development conditions during the same storm event, or the existing capacity for the receiving storm sewer, whichever is less. Regardless of post development conditions, WWFMG require that the maximum runoff coefficient used in calculating the pre-development peak runoff rate is limited to 0.5.

As indicated, the predevelopment imperviousness of the site is 65% (or  $c=0.65$  +/-). Since the 65% runoff rate exceeds the allowable coefficient of 0.5, the allowable post development discharge from the site is restricted to a 0.5 runoff coefficient.

Tables 3.1 and 3.2 indicate that the allowable discharge rates for the 2-year and 100-year storms respectively for the site based on a runoff coefficient of 0.5 are as follows:

- Allowable 2-year storm peak discharge rate 409 L/s.
- Allowable 100-year storm peak discharge rate 1161 L/s.

Thus, discharges from the site must not exceed the above allowable discharge rates.

Storm water peak flow discharges from the site may be controlled to within the allowable discharge rate by providing a control flow pipe (that is, an intentionally reduced outlet pipe size to restrict outflows) to the City storm sewers.

### EROSION CONTROL

As per the City's WWFMG, specific onsite erosion control measures are not required for this site since the site is not located in close proximity to any watercourse.

### FLOOD FLOW MANAGEMENT

The WWFMG require flood flow management up to the 100-year storm. Thus, on-site storm water detention is required to detain the difference between post and pre-development discharge for all storms up to the 100-year storm.

Tables 3.1 and 3.2 provide preliminary estimates based on the Modified Rational Method for onsite storm water detention storage volumes for the 2-year and 100-year storm. Preliminary onsite detention storage requirements are as follows:

- 2-year storm onsite detention storage 142 m<sup>3</sup>
- 100-year storm onsite detention storage 403 m<sup>3</sup>

Onsite storm water detention may be achieved by storm water detention tank measures located in the underground parking garage in the development. Other detention storage measures may also be suitable and can be explored at the detailed design stage of the development.





## EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION

Best management practices for erosion and sediment controls are recommended during construction. General erosion and sediment controls may include silt fence, straw bales, erosion check dams and mud mats to prevent vehicle mud tracking on City roadways. Appropriate measures will be implemented, as warranted, on a daily basis as part of the contractor's daily construction responsibility. Actual controls will be dictated by construction staging and activities, which are not yet known at this preliminary stage of the development process.

General erosion and sediment control recommendations that can be made at this time are as follows:

- Install a silt fence such as per Ontario Provincial Standard Drawing OPSD- 219.110 where required along the down slope construction limits in conjunction with any necessary construction hoarding to prevent silt laden drainage to the adjacent roads and properties
- Prevent silt laden water during building foundation excavation from entering storm sewers by installing appropriate filtration at pump locations
- Install mud mats to prevent construction vehicles tracking mud on City roads

## FOUNDATION DRAINS

As with all buildings with basement levels and/or deep foundation, it will be necessary to pump any accumulated groundwater at foundation and under-slab sub-drains in order to prevent water infiltration into the building. Thus, it will be necessary to pump foundation drains directly to the City storm sewer. Due to the urban nature of this site, it is recommended that groundwater be pumped to the proposed storm service connection and discharged directly to the City's sewer via the proposed storm service connection rather than be discharged at ground level for surface drainage on the City sidewalks and roads.

Groundwater discharges should connect to the proposed storm service connection pipes downstream of any proposed storm water controls, which are intended to control storm water runoff only.

## c) Water Supply Existing Condition

Municipal water mains exist across the Milner Avenue and Markham Road frontages of the site. These water mains include the following:

- A 300mm diameter water main on the west side of Milner Avenue
- A 300mm diameter water main on the east side of Markham Road

Preliminary information obtained from the City indicates that the subject site is located within Pressure Area No. 4 of the City's water supply network. The geodetic top water level elevation of the reservoir serving this area is 230.1 m and the reservoir water level maintains an approximate static water pressure of approximately 80 psi at the site.


## Proposed Condition

Table 6 provides preliminary estimated average day, maximum day and peak hour domestic water supply requirements for the proposed development.

Based on the size of the existing boundary City water mains and the available static pressure at the site, it is anticipated that the domestic water and fire flow requirements of the proposed development may be adequately serviced by extending private water mains into the proposed development from existing City water mains.

As per normal building design practice, necessary building fire protection measures for the proposed building will be addressed during the detailed building design stage. At that time, appropriate fire protection measures will be included in the building design to meet building and fire code requirements based on actual available water supply and pressures. Fire hydrant flow tests are recommended prior to the detailed design stage to confirm existing water supply and pressures to provide for necessary fire protection measures.





# **8 CURRENT / PROPOSED INITIATIVES & STUDIES**



<b>Legal Survey Update</b>	Ongoing
<b>Topographical Survey Update</b>	Ongoing
<b>Underground Utilities Survey Update</b>	Ongoing
<b>Archaeological Study</b>	Ongoing
<b>Phase 1 &amp; 2 Environmental Site Assessment</b>	Completed
<b>Noise, Vibration &amp; Wind Studies</b>	To be undertaken once concept is finalized
<b>Toronto Green Standards Checklist</b>	To be undertaken once concept is finalized
<b>Sun/Shadow Study &amp; Building Mass Model</b>	To be undertaken once concept is finalized
<b>Engineering &amp; Technical Studies (Transportation / SWM / Servicing / Contaminated Site Assessment )</b>	To be undertaken once concept is finalized
<b>Arborist / Tree Preservation Report / Statement</b>	To be undertaken once survey is updated
<b>Concept Development</b>	Ongoing



# 9 NEXT STEPS



