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URBAN & REGIONAL PLANNERS, LAND DEVELOPMENT CONSULTANTS

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December 14, 2022

City of Mississauga
Planning & Building Department
300 City Centre Drive
City of Mississauga
L5B 3C1

Re: Green Development Standards Compliance Summary – Low Impact Design Features
Proposed Mixed-Use Development
2077, 2087, 2097, 2105 Royal Windsor Drive
City of Mississauga

In support of the Official Plan/ Zoning By-law Amendment Application for the lands municipally addressed as 2077, 2087, 2097, 2105 Royal Windsor Drive, please find herein a detailed summary of the ways in which the proposed development incorporates green sustainable elements into the site design as per the 'Made in Mississauga' Green Development Strategy (GDS) 2012.

The applicant will analyze the following list of proposed Low Impact Design features through the development review process to be incorporated into the site design. We submit that more detailed design of these features will be satisfied through the detailed design, or Site Plan process. As such, we offer these strategies and solutions as high level concepts.

1. Stormwater Retention

The purpose of these features is to control the stormwater quantity and improve its quality prior to release off site.

- With respect to stormwater quantity, a water balance approach has been considered for the subject site. 5mm of stormwater retention during each storm event will be stored within the proposed stormwater tank and will be reused on site, through irrigation, within 72 hours. Moreover, in order to achieve quality control of Level 1 (80% TSS removal), the implementation of an Oil-Grit Separator (OGS) device will be also proposed.

LID features are an important feature of sustainable development and should be implemented whenever possible. The Stormwater Retention strategies for consideration are:

- Vegetated filter strips;

- Enhanced grass swales;
- Increased absorbent landscaping and permeable pavement;
- Grassed swales and landscape features to provide attenuation and improve discharge; quality from all rooftop downspouts; and,
- Oil-grit separator (OGS).

2. Soft Landscaping and Pedestrian Comfort Strategies

As previously stated, soft landscaping materials will be further defined at the detailed Site Plan stage. The team will commit to explore drought tolerant, native, and pollinator species that enhance biodiversity and provide habitat.

Efforts have been made to locate planting within the best growing conditions on site, taking advantage of light and soil volumes available.

Soft landscape materials have been considered in the site design though the provision of increased absorbent landscaping to reduce the volume and rate of stormwater runoff from hard surface areas as well as landscaped areas. The soft landscaping has been strategically selected and placed in areas to yield the highest rate of satisfaction within the pedestrian realm. The pedestrian realm has been considered and enhanced through the provision of continuous walkways, amongst other landscaping and design strategies.

The Soft Landscaping and Pedestrian Comfort Strategies for consideration are:

- All efforts will be made to provide sufficient soil for Tree Planting;
- Shade trees are proposed 6-8m apart along all street frontages and pedestrian walkways;
- Native plant species will be incorporated as part of the site's planting scheme;
- Large canopy trees are proposed along pedestrian pathways and amenity areas to provide shade in hot summer months;
- Long-term and short-term bicycle parking is provided in convenient locations throughout the site (building entrances and amenity areas);
- A variety of seating is encouraged throughout the site for the public and residents.
- All pedestrian walkways are continuous, connected and accessible; and,
- The private access driveway has been designed to incorporate features and standards to mimic a public roadway.

3. Exterior Building Design

The building design considers green development design principles and goals. Potential strategies and approaches to reduce the carbon emissions associated with the project have been examined through two routes: operational and embodied carbon.

The Exterior Building Design Strategies for consideration are:

1. Passive sustainable design principles for consideration are:

   a. Careful massing and studying of shadowing to maximize daylight and sunlight access, and minimize impact on the surrounds;
   b. Window to wall or Glazing ratios and treatment of the envelope to maximize thermal performance and reduce energy consumption;
   c. Bird friendly glazing used up to 12m above grade and above green roofs; and,
   d. Green roofs, both intensive and extensive incorporated where possible to provide amenity and reduce the heat island effect.

2. Active sustainable design principles broadly capture a holistic sustainable design approach; these complement exterior building passive design principles. Active sustainable design principles for consideration are:
   a. Innovative low energy heating and cooling systems;
   b. Heat recovery systems;
   c. EV Parking;
   d. Rainwater harvesting; and,
   e. Greywater re-use.

4. LEED-NC Requirements

Exterior Building Design elements will be further refined throughout the forthcoming processes. It is out understanding that the City of Mississauga prioritizes high performance green buildings, and so, this applicant will continue to identify opportunities for achieving guidelines outlined in the manual/standards, where feasible.

Further, this submission considers:

- Bicycle storage facilities in the underground and at grade;
- All air exhaust and intakes are located away from pedestrian routes and amenity areas;
- All sidewalks are designed to be continuous and connected to building entries;
- Ground level grates to be designed to have porosity of less than 20mmx20mm;
- All exterior lighting to be shielded.

The design of the Clarkson GO masterplan development has been conducted with the consideration of SLATEs own ESG goals and opportunities that the site and program requirements offer to reduce the environmental impact of the project. The design submitted has reduced this ratio to 0.6 spaces per residential unit; responding to the proximity of the site to the Clarkson GO station and with the intention of reducing the embodied carbon impact of the project. This strategic move to reduce the residential parking requirement and in turn decrease the number of required undergorund parking levels saves 5.2 million kgCO2e in embodied carbon which is the equivalent of 7000 round trip flights to Vancouver, and an additional 1.9mil kgCO2e **per year** due to the reduction of cars on the road. The attached narrative provides an in depth review of the parking study.

We trust that the above is a suitable summary for the inclusion of Green Design Standards that have been incorporated in site design to date. The above is subject to further refinements and additions throughout the detailed site design process. We look forward to your positive feedback regarding our efforts to generally comply with the guidelines as put forth by the City of Mississauga.

Memorandum

Gensler

To	Slate Asset Management	**Fax No.** **Telephone No.**	
From	Duanne Render	**Date**	2022-12-13
Project	Clarkson GO	**Project Number**	067.1245.000
Subject	Below Grade Parking Strategy & Embodied Carbon Reduction Potential	**File**	5DR
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The design of the Clarkson GO masterplan development has been conducted with the consideration of SLATEs own ESG goals and opportunities that the site and program requirements offer to reduce the environmental impact of the project. In particular, potential strategies and approaches to reduce the carbon emissions associated with the project have been examined through two routes: operational and embodied carbon. Due to the early stage of the design, below outlines a summary of approaches to be considered as the design developed but focuses specifically on the significant carbon reduction that may be achieved through the reduction of below grade parking in the design.

Careful massing and studying of shadowing along with a consideration of glazing ratios and treatment of the envelope have been incorporated into the design. This, along with future assessments of the viability of innovative heating and cooling systems, electrification, and heat recovery, broadly capture a holistic approach to reducing the energy consumption and, in turn, the greenhouse gas intensity of the operations of the building, (GHGI-O), measured in kilograms of carbon emitted per square meter of the project, per year (kgCOE2/m2/yr).

Given the height of the project and the state of current code limitations to mass timber construction, the embodied carbon associated with the structural design of the project may be approached from two primary routes. The first is to consider the use of lower-carbon concrete through the incorporation of GGBS or fly ash into the concrete mix. Such an approach will be considered as the design continues; finding opportunities to reduce the embodied greenhouse gas intensity of the project (GHGI-E).

The second approach to significantly reduce the embodied carbon associated with project lies with the savings that are associated with reducing the below-grade parking provision in the design, as depicted in the zoning application drawings of the submission. The city of Mississauga planning guidance calls for a nominal 0.9 parking spaces to be provided per each residential unit in a multi-unit residential building (MURB).

Due to the site constraints of the development, coupled with standard convention, results in the need for this parking to be situated below grade. The design submitted has reduced this ratio to 0.6 spaces per residential unit; responding to the proximity of the site to the Clarkson GO station and with the intention of reducing the embodied carbon impact of the project.

Parking and Embodied Carbon Calculation	West Block	East Block
0.6 Spaces per Unit	445	417
0.9 Spaces per Unit	668	626
GFA Per Parking Each Floor (sqm)	3,878	5,817
Number of Floors at 0.6 Spaces Per Unit	5	3
GFA for all below grade parking at 0.6 spaces per unit (sqm)	19,388	17,450
Bike Parking (to be removed from Calculation (sqm)	546	288
Below grade parking GFA, less Bike Parking (sqm)	18,842	17,162

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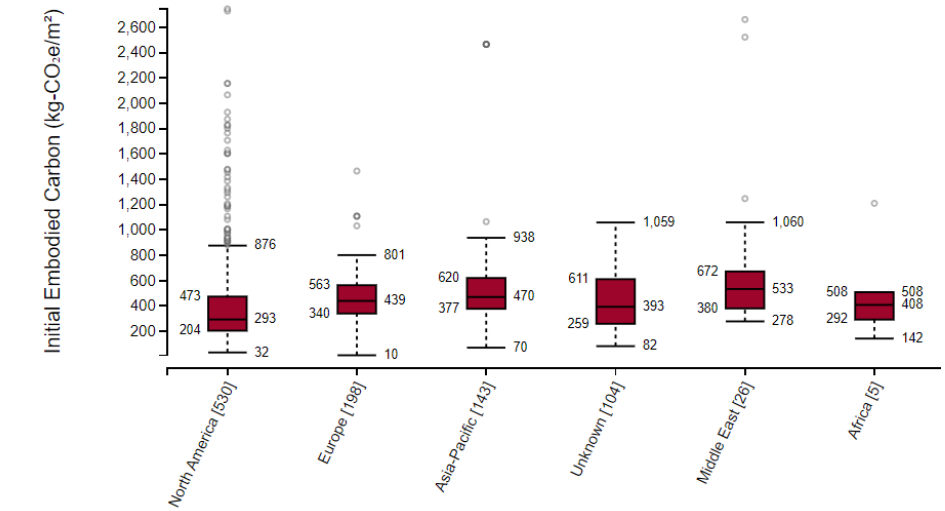
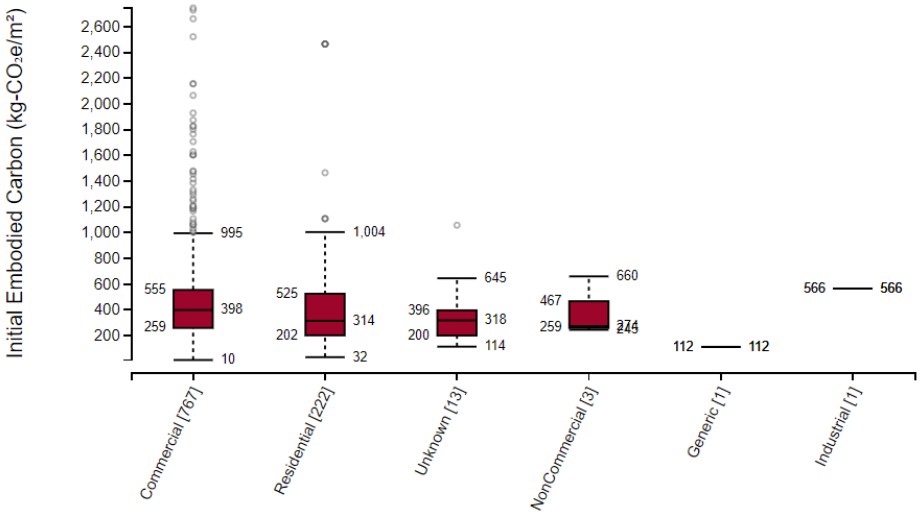
The reduction offered by moving from a 0.9 to 0.6 parking to unit ratio may be calculated at this initial design stage by considering the GFA associated with the parking design and applying a high-level carbon unit rate (kgC02e/m2) to that floor area. For the purposes of the study conducted at this early stage in the design, 2017 Embodied Carbon Benchmark Study by the Carbon Leadership Forum has been used to apply this unit rate.

Reviewing the summary data of Residential Units, Buildings Above 14 Stories, and the Median embodied carbon for the structure of the building offer a spectrum of structural embodied carbon intensities, with the lowest median number of **293 kgCO2e/m2** has been used as a conservative estimate. This may be referred to in the below image, taken from the data visualization tool of the CLF benchmark study:





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When this unit rate is applied to the parking design of the project, and then compared to the baseline of 0.9 spaces per unit, significant reductions in carbon may be achieved, as outlined below.

Parking and Embodied Carbon Calculation	West Block	East Block
0.6 Spaces per Unit	445	417
0.9 Spaces per Unit	668	626
GFA Per Parking Each Floor (sqm)	3,878	5,817
Number of Floors at 0.6 Spaces Per Unit	5	3
GFA for all below grade parking at 0.6 spaces per unit (sqm)	19,388	17,450
Bike Parking (to be removed from Calculation (sqm)	546	288
Below grade parking GFA, less Bike Parking (sqm)	18,842	17,162
Embodied Carbon Per SQM of Concrete Structure (kgCO2e/m2)	293	293
Approximate Embodied Carbon for proposed Scheme (kgC02e)	**5,520,809**	**5,028,372**
Area per Parking Space	42	41
Embodied Carbon Per Parking Space	12,406	12,058
Approximate GFA based on Current Efficiency, when 0.9 ratio applied	28263.525	25742.52
Approximate Embodied Carbon for proposed Scheme (kgC02e)	**8,281,213**	**7,542,558**
Embodied Carbon Delta between 0.6 spaces per unit and 0.9 spaces per Unit (kgCO2e)	**2,760,404**	**2,514,186**
Embodied Carbon Reductions associated with providing 0.6 parking spaces per unit instead of 0.9 (kgCO2e)	**5,274,590**	

This reduction of 5.27 million killgorams of carbon savings; the equivilenat of over 7,000 round-trip flights Toronto to Vancover. This highlevel assememtn is based on the Carbon Footprint Calculator.

Carbon Comparisons	
Round Trip Toronto Vancouver Economy (kgCO2e)	750
Number of Flights Relative to Carbon Saved in Basement Removal through Parking Reduction	7,033

In addition to the savings associated with reduction of below-grade concrete structures, the removal of parking spaces from the building may encourage residential unit owners to reconsider the need for cars at all. As such, a high level study was taken to understand the quantum of potential carbon reduction possible by the removal of cars from the road that could be resultant from parking reduction. Using the benchmark of 4,600 kgCO2e/yr for the average Canadian car as outlined by National Resources Canada , the year 1 savings by removing 431 cars from the road could be as much as an additional 1.98 million kg of Carbon.

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Parking and Carbon Calculation	Entire Development
0.6 Spaces per Unit	862
0.9 Spaces per Unit	1,293
Number of Cars taken off the road	431
Average Canadian Car Carbon Emissions (kgCO2e/yr)	4,600
Nominal annual emissions reduction of removing cars from the road by providing less parking in the development (kgCO2e/yr)	**1,982,600**
5 Year Emissions Reduction, assuming current fuel efficiency of average cars	**9,913,000**

While the design of the Clarkson GO masterplan is in early design, the narrative described offers an additional rationale and basis for the benefits of reducing below grade parking provision from 0.9 spaces per unit to 0.6.

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