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SMART CENTRES REIT
1225 Dundas Street E, Mississauga, Ontario
July 08, 2022

Shadow Study Summary

This shadow study consists of this written report together with attached Shadow Impact Study drawings dated **July 08, 2022**.

SHADOW MODELLING INFORMATION

1. Site latitude and longitude used for this study are based on the latitude and longitude of the Mississauga Civic Centre at 300 City Centre Drive, Mississauga, Ontario, L5B 3C1 as follows:

Latitude: 43° 35' 20" N (43.5833° N)

Longitude: 79° 38' 40" W (79.5833° W)

2. **Time Zone:** Eastern
3. **Standard Time:** UT – 5 hours -applies on December 21st
Daylight Time: UT – 4 hours -applies on June 21st and September 21st
4. **Astronomic North** was determined based on the North Arrow of the land survey provided by Mauro Group Inc. dated May 10, 2022.
5. The **source of the base plan** is a combination of a GIS map and the land survey provided by Mauro Group Inc. Existing surrounding building mass and heights were obtained from the City of Mississauga, and the proposed building model was accurately depicted by Turner Fleischer Architects Inc. with all details that would pertain to the shadow pattern included.
6. This shadow analysis is based on an assumed flat ground plane at elevation 120.5 m. Building heights relate to this datum. The datum is the ground floor elevation of the proposed buildings
7. **Shadow Criteria:**
 - i. **Criterion 1 - Residential private amenity spaces – Jun 21 and Sep 21**
Shadow impacts from proposed developments should not exceed one hour in duration on areas such as private rear yards, decks, patios and pools of surrounding residential dwellings. This criterion is met if there is shadow impact for no more than two consecutive hourly test times in the “No Impact Zone” i.e. within 7.5 m of an exterior wall of a dwelling that abuts private amenity space.

- iii. **Criterion 2** - Communal Places where children play – **Jun 21, Sep 21 and Dec 21**
Shadows from proposed developments should allow for full sun on the following places at least half the time, or 50% sun coverage all the time, on each given date: school yards, tot-lots, play areas and park features such as sand boxes, wading pools, etc., and outdoor amenity areas used by seniors and those associated with commercial and employment areas. This criterion is met if the “sun access factor” is at least 50% on each of the test dates. This criterion applies to public areas as well as those common outdoor amenity areas that are part of a proposed development.
 - iv. **Criterion 3** - Public realm including sidewalks, open spaces and plazas - **Sep 21**
 - a. Sidewalks on low and medium-density residential streets - No incremental shade at 9:12, 10:12, 11:12, 15:12, 16:12 and 17:12 hours
 - b. Sidewalks on mixed-use, commercial, employment and high-density residential streets - No incremental shade at 12:12, 13:12, and 14:12, and either 9:12, 10:12, and 11:12 or 15:12, 16:12 and 17:12 hours
 - c. Public open spaces, parks and plazas - Sun Access Factor 50% minimum
 - v. **Criterion 4** - Turf and flower gardens in public parks - **Sep 21**
Full sun is required at 7 test times.
 - vi. **Criterion 5** - Building faces to allow for the possibility of using solar energy – **Sep 21**
This criterion is met if there is shadow impact for no more than two consecutive hourly test times in the “No Impact Zone” i.e. within 3m of the front, rear or exterior side walls of adjacent low-rise residential buildings.
8. **Review of Shadow Drawings vs. Shadow Criteria**
- i. **Criterion 1** – While the proposed development does cast shadows onto residential private amenity spaces, the impact does not exceed the two consecutive hourly test times on Jun 21 and Sep 21, therefore the criterion is satisfied.
 - ii. **Criterion 2** – While there are instances where the proposed development casts shadows onto communal outdoor amenity areas, full sun is permitted on the outdoor amenity areas from the development for at least half the test times.
 - iii. **Criterion 3a** – The proposed development does not allow for full sunlight on the north side of Dundix Rd as some portions are shaded between 9:12 and 10:12.
 - iv. **Criterion 3b** – The proposed development satisfies this criteria with sunlight permitted on the opposite boulevard at 12:12pm to 5:12pm.
 - v. **Criterion 3c** – We have identified no public open spaces or plazas within the proposed building shadow zone.
 - vi. **Criterion 4** – We have identified no turf or flower gardens impacted in the shadow zone.
 - vii. **Criterion 5** – Shadows of proposed buildings do not impact the defined “No Impact Zone” for more than 2 consecutive hourly test times on Sep 21.

9. Description of Locations Not Meeting Shadow Criterion

- a. **Criterion 1** – None
- b. **Criterion 2** – None
- c. **Criteria 3a to 3c** – Portions of Dundix Rd are shaded by the proposed towers and podium between the hours of 9:12 and 10:12.
- d. **Criterion 4** – None
- e. **Criterion 5** – None

10. In summary, the proposed development meets most of the criteria in place by the City of Mississauga’s Standards for Shadow Studies as described herein.

DATE JUNE 21	AZIMUTH (deg)	SLF (L/H)
LOCAL TIME (EDT)		
5:37	235.73	
7:07	250.48	4.1230
7:20	252.58	3.5045
8:20	262.02	2.0048
9:20	272.04	1.3106
10:20	283.79	0.8976
11:20	299.52	0.6203
12:20	323.67	0.4375
13:20	0.00	0.3670
14:20	36.32	0.4375
15:20	60.47	0.6203
16:20	76.21	0.8975
17:20	87.96	1.3105
18:20	97.98	2.0047
19:20	107.42	3.5042
19:33	109.41	4.0852
21:03	124.27	

Table 1: Mississauga Sun Angle Data (June 21)*

DATE: SEPTEMBER 21	AZIMUTH (deg)	SLF (L/H)
LOCAL TIME (EDT)		
7:05	268.27	
8:35	284.22	3.6329
9:12	291.23	2.5132
10:12	304.14	1.6445
11:12	319.68	1.2181
12:12	338.54	1.0011
13:12	0.00	0.9329
14:12	21.45	1.0022
15:12	40.28	1.2205
16:12	55.79	1.6495
17:12	68.68	2.5255
17:48	75.63	3.6493
19:18	91.46	

Table 2 Mississauga Sun Angle Data (September 21)*

DATE DECEMBER 21	AZIMUTH (deg)	SLF (L/H)
LOCAL TIME (EDT)		
7:49	302.37	
9:19	319.05	4.8874
10:17	331.25	3.1643
11:17	345.21	2.5293
12:17	0.00	2.3589
13:17	14.79	2.5293
14:17	28.75	3.1644
15:15	41.06	4.9172
16:45	57.63	

Table 3 Mississauga Sun Angle Data (December 21)*

#	Bearing
1	N 45° 23' 30" W
2	N 3° 30' 20" W
3	N 38° 19' 15" E
4	N 51° 40' 45" E
5	N 38° 21' 10" E
6	N 51° 40' 45" W
7	N 38° 19' 15" E
8	N 51° 40' 45" W
9	N 38° 08' 20" E

Table 4 Complete list of bearings for site at 60 Bristol Road East