January 9, 2015

Gouled Osman
Forest Park Circle Ltd.
331 Cityview Boulevard, Suite 300
Vaughan, Ontario
L4H 3M3

Dear Mr. Osman:

Re: Qualitative Pedestrian Wind Assessment
4100 Ponytrail Drive, Mississauga, Ontario
GWE File: 14-118-DTPLW R2

1. INTRODUCTION

Gradient Wind Engineering Inc. (GWE) was retained by Forest Park Circle Ltd. to undertake a qualitative pedestrian wind assessment to support a rezoning application for a planned residential development located at 4100 Ponytrail Drive in Mississauga, Ontario. The study is based on preliminary architectural drawings provided by Turner Fleischer Architects Inc. in December of 2014, a review of existing surrounding context and recently approved developments, statistical knowledge of the Mississauga / Greater Toronto Area (GTA) wind climate, and experience with similar past projects in Mississauga, the GTA, and Toronto.

Qualitative assessments, as compared to more elaborate wind tunnel or computational studies, serve to determine the suitability of anticipated wind conditions within various pedestrian areas, and to provide useful recommendations for mitigation that can be considered early in the design process.

2. TERMS OF REFERENCE

The project is located at 4100 Ponytrail Drive, which is situated to the south of the junction formed by Ponytrail Drive and Rathburn Road East in Mississauga, Ontario. The development consists of two (2) residential buildings with square floor plates in separate phases. The phase 1 building 'C' rises nine (9) storeys above a rectangular three-storey podium, to a total height of twelve (12) storeys above grade, and is located within the southeast quadrant of the property boundary. The phase 2 building 'D' rises twelve (12) storeys above a separate three-storey podium, to a total height of fifteen (15) storeys above grade, and is located within the northwest quadrant of the site closest to Rathburn Road East. The proposed buildings are situated between two (2) existing 18-storey multi-faceted buildings; building 'A' is located within the northeast quadrant, while building 'B' is located within the southwest quadrant.

Regarding wind exposure, local surroundings comprise a moderately dense mixture of mostly low-rise residential buildings. Also, Pearson International Airport is located approximately twelve (12) kilometres (km) to the northwest of the subject site. As such, the existing massing creates generally suburban wind exposures for all wind directions. With respect to pedestrian winds, key areas under investigation include the public sidewalk along Rathburn Road East, as well as building access points for both buildings, inclusive of the main residential entrance. The assessment also discusses pedestrian wind comfort within the Outdoor Amenity Space (OAS) shared by buildings A, B, C, and D at grade. For the purpose of illustrating and discussing the various pedestrian sensitive locations, the roof plan for the full development is provided in Figure 1.

3. METHODOLOGY

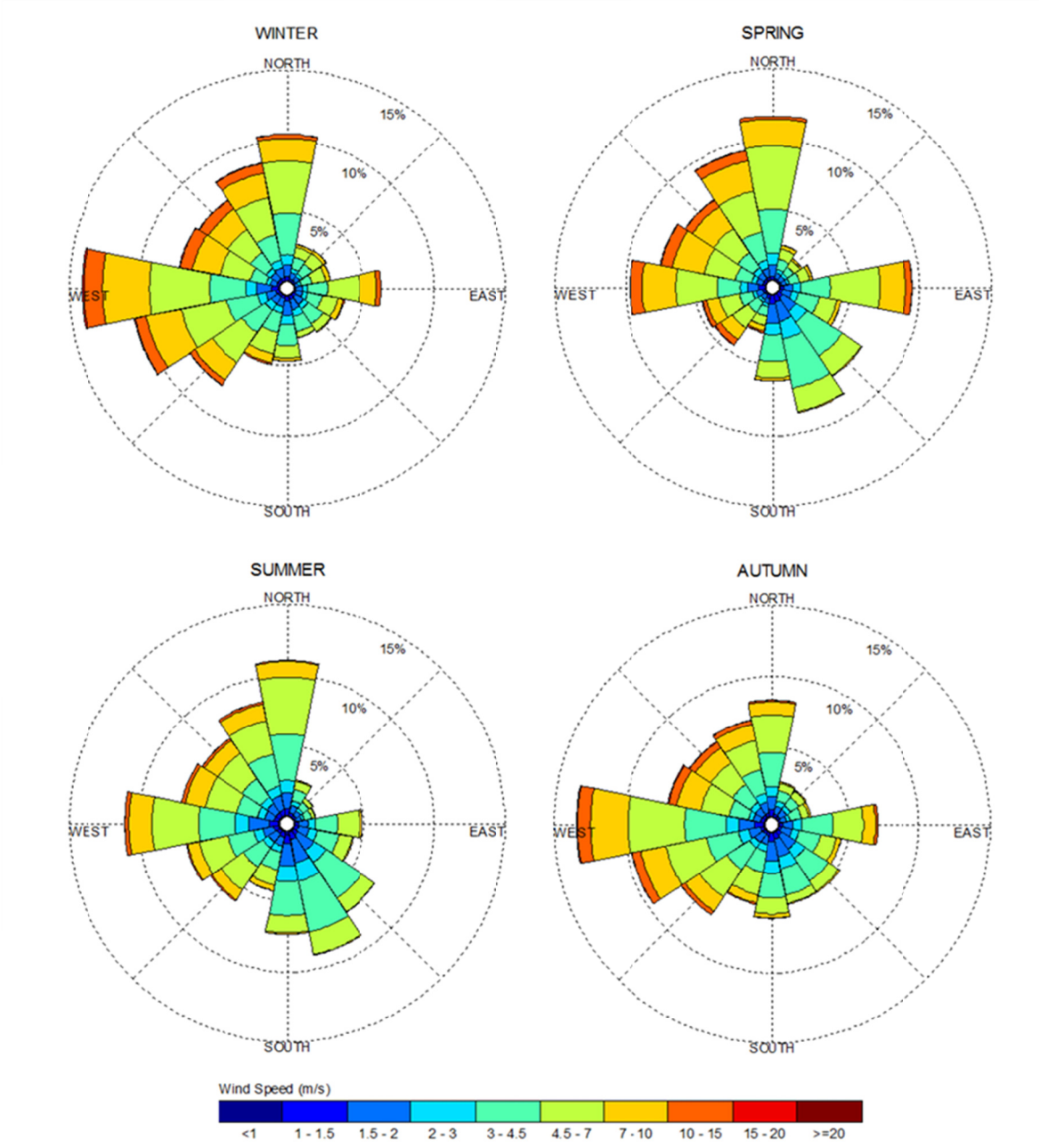
The following section describes the analysis process, including a background discussion of pedestrian comfort. The essential aspects of a qualitative pedestrian wind analysis include (i) consideration of the statistical properties of the local wind climate; (ii) consideration of the massing of the site (i.e., the shape, height, and orientation of the buildings); and (iii) evaluation of anticipated pedestrian comfort measured against industry-standard guidelines based on in-house experience.

3.1 Mississauga Wind Climate

The statistical model of the Mississauga wind climate, which guides the assessment within the Greater Toronto Area (GTA), indicates the directional character of local winds on a seasonal basis and is illustrated on the following page. The plots illustrate seasonal distribution of measured wind speeds and directions in meters per second (m/s). Probabilities of occurrence of different wind speeds are represented as stacked polar bars in sixteen (16) azimuth divisions. The radial direction represents the percentage of time for various wind speed ranges per wind direction during a 40-year measurement period. The preferred wind speeds and directions can be identified by the longer length of the bars. For Toronto and the GTA, the most common winds occur for westerly wind directions, followed by those from the east, while the most common wind speeds are below 10 m/s.

The directional preference and relative magnitude of wind speed changes somewhat from season to season. Also, by convention in microclimate studies, wind direction refers to the wind origin (e.g., a north wind blows from north to south).

SEASONAL DISTRIBUTION OF WINDS FOR VARIOUS PROBABILITIES
PEARSON INTERNATIONAL AIRPORT, TORONTO



NOTES:

1. Radial distances indicate percentage of time of wind events.
2. Wind speeds represent mean hourly wind speeds measured at 10 metres above the ground.

3.2 Pedestrian Wind Comfort Guidelines

The pedestrian comfort guidelines used by GWE, which parallel industry standards, including the City of Mississauga *Urban Design Terms of Reference* (2014), are based on the correlation between a variety of pedestrian activity types, and acceptable wind speed ranges for those activities. More specifically:

(i) Wind conditions are considered to be comfortable for *sitting* when gust wind speeds less than or equal to 14 kilometers per hour (km/h) occur at least 80% of the time. The corresponding equivalent mean wind speed is approximately 10 km/h.

(ii) Wind conditions are considered to be comfortable for *standing* when gust wind speeds less than or equal to 21 km/h occur at least 80% of the time. The corresponding equivalent mean wind speed is approximately 15 km/h.

(iii) Wind conditions are considered to be comfortable for *walking* when gust wind speeds less than or equal to 30 km/h occur at least 80% of the time. The corresponding equivalent mean wind speed is approximately 20 km/h.

GWE's guidelines are based on gust wind speeds since people are most sensitive to wind gusts rather than to constant wind speeds, and are applied according to the intended use of the outdoor area.

3.3 Influence of Massing and Climate

The physical features of a site that influence the local wind microclimate include: the density of surrounding buildings, the massing of the study site, and the geometry of the study building(s). Of particular importance for microclimate studies, massing density typically increases over time, which can provide greater shielding to wind and calmer wind conditions at grade.

For the subject site, pedestrian comfort will primarily be influenced by winds originating from the southwest clockwise through to northwest, as well as from the east. Although the remaining wind directions have a lower statistical frequency of occurrence, strong wind flows associated with multiple low probability wind directions can cumulatively influence pedestrian comfort. Based on the orientation of the proposed development relative to prominent wind directions, the spacing of the proposed buildings C and D to the existing taller buildings A and B, and in-house knowledge of common wind impacts and bluff body aerodynamics, overall wind conditions on a seasonal basis are expected to be moderately windy at grade but nonetheless acceptable around the subject site.

4. ANTICIPATED PEDESTRIAN COMFORT

Based on the massing of the study site, surrounding building massing and the orientation to the local wind climate, the following statements summarize our experience of how these conditions affect pedestrian comfort in key areas around the site.

North Elevation of Buildings C and D (Figure 1, Tag A): The grade-level areas along the north façade of buildings C and D will be exposed to a combination of frontal and transverse winds from prominent directions. Of particular importance, downward accelerating wind flow along the north façade of building D is expected to be more severe than that along the north façade of building C. Therefore, a canopy over the main entrance of building D is recommended, extending at least 2 meters (m) away from the building, while a similar canopy is suggested for building C. Additionally, it is recommended that vestibules be created for both noted entrances to ensure comfortable access while reducing stress on door hardware. Therefore, wind conditions along the north façade of buildings C and D are expected to be suitable for sitting during the summer, standing during the early autumn, and suitable for walking during the remaining colder months. The wind conditions described above are also considered acceptable for the planned walkways located away from and along the noted façades, as well as for the public sidewalk area along Rathburn Road East.

West Elevation of Buildings C and D (Figure 1, Tag B): Similar to the north elevations of the development buildings, the grade-level areas along the west façade of buildings C and D will also be exposed to a combination of frontal and transverse winds from prominent directions. However, buildings C and D are set back from their respective podia on the nominal west elevation, which is expected to reduce downwash winds off the face of the buildings and improve pedestrian wind comfort at grade. Therefore, the noted set-backs together with the spacing among buildings A, B, C, and D are expected to create conditions suitable and acceptable for sitting during the summer, standing during the early autumn, and suitable for walking during the remaining colder months.

South Elevation of Buildings C and D (Figure 1, Tag C): Wind conditions along the south façade of buildings C and D are expected to be calm on account of the set-backs described above, the relative spacing of the site massing, and the turbulence generated from the surrounding low-rise dwellings. As such, conditions will be suitable for sitting during the summer, standing during late spring and throughout the autumn season, and suitable for walking during the winter and the remaining colder months of spring. These conditions are considered to be acceptable for the intended uses of the spaces.

East Elevation of Buildings C and D (Figure 1, Tag D): The east façade of both proposed buildings are shielded from west winds but exposed to east winds, which are prominent during the spring, winter, and autumn seasons (listed in order of descending wind speed strength). As such, generally calm conditions are expected along the east side of the development at grade. More specifically, pedestrian wind comfort along the east façade is expected to be suitable for sitting during the summer and autumn months, and suitable for standing during the spring and winter months; conditions which would therefore be acceptable for the intended uses of the spaces throughout the year.

Shared Outdoor Amenity Space at Grade (Figure 1, Tag E): A large shared Outdoor Amenity Space (OAS) is situated between buildings A, B, C, and D. The OAS is exposed to west and east winds, as well as to accelerated winds created by existing and proposed buildings. In order to ensure comfortable conditions within the OAS from late spring through to mid-autumn, when usage is assumed to be greatest, the implementation of landscaping may be required to shield prominent southwest clockwise through to east winds. GWE can support the landscape architect to develop an effective landscape plan for Site Plan Application.

Existing vs Future Wind Conditions: The introduction of the proposed buildings C and D is not expected to considerably influence existing grade-level wind conditions near the study site. Although modest changes to wind speeds may occur beyond the site property, pedestrian comfort over areas outside the immediate influence of the study site is expected to remain similar to existing conditions.

5. SUMMARY AND RECOMMENDATIONS

Based on the qualitative analysis of site plans, the proposed building forms, and the wind statistics for Mississauga and the Greater Toronto Area, the residential development located at 4100 Ponytrail Drive in Mississauga is expected to experience grade-level wind conditions mostly suitable for all intended uses on a seasonal and annual basis.

Downwash is expected from the north façade of the 15-storey building D. As such, a canopy over the main entrance of building D is recommended, extending at least 2 meters (m) away from the building, while a similar canopy is suggested for building C. Additionally, it is recommended that vestibules be created for the main entrances on the north façade of both proposed buildings to ensure comfortable access while reducing stress on door hardware.

A shared Outdoor Amenity Space (OAS) is situated between the proposed buildings C and D, and the existing 18-storey buildings A and B. In order to ensure comfortable conditions within the OAS from late spring through to mid-autumn, when usage is assumed to be greatest, the implementation of landscaping may be required to shield prominent southwest clockwise through to east winds. GWE can support the landscape architect to develop an effective landscape plan for Site Plan Application.

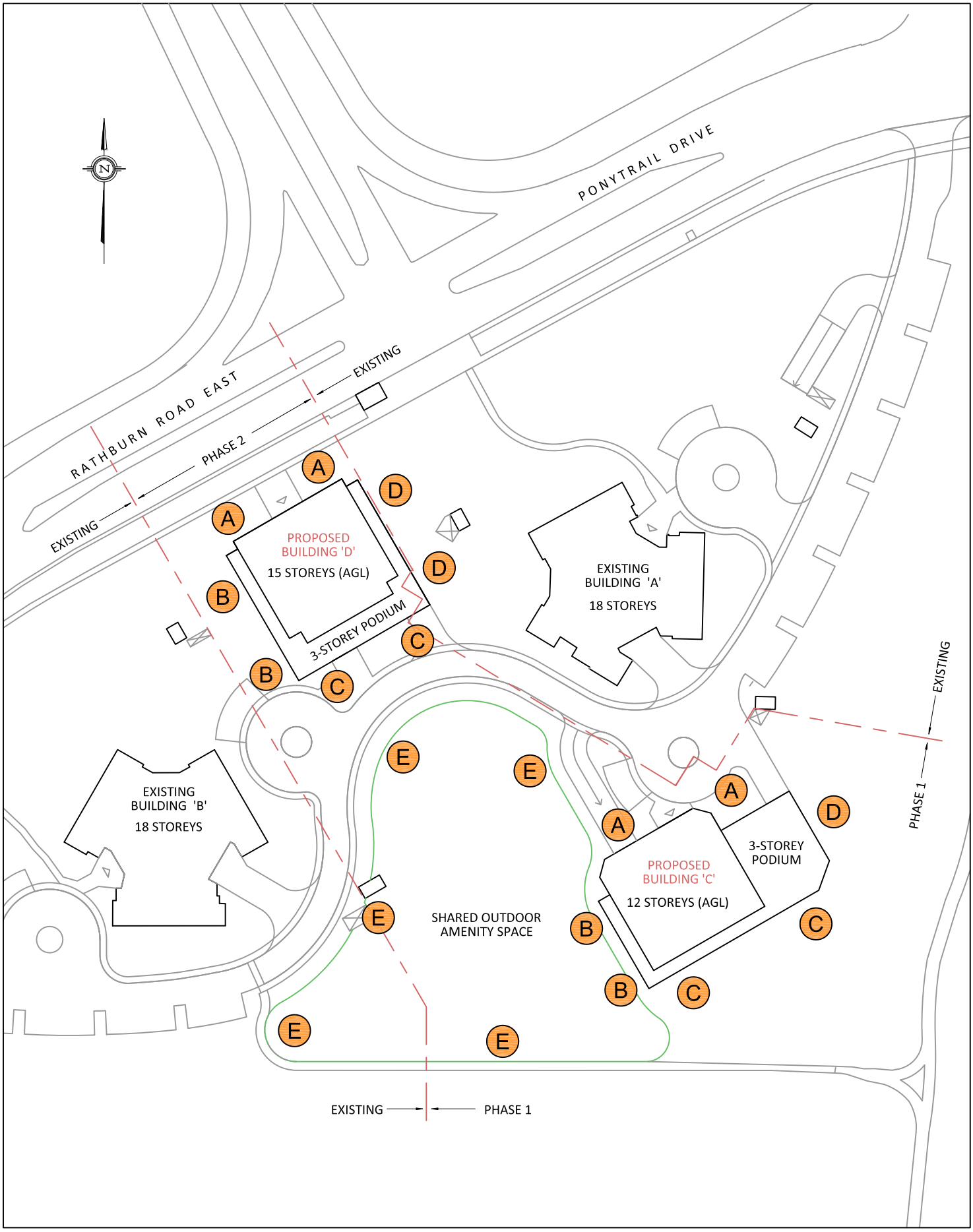
The foregoing analysis and statements are based on experience and knowledge of wind flow patterns in suburban settings. Hence, this assessment is intended to assure adequate pedestrian safety relating to wind while providing general guidance relating to pedestrian comfort around the subject site. This concludes our pedestrian level wind assessment and report. Please advise the undersigned of any questions or comments.

Sincerely,

Gradient Wind Engineering Inc.

Justin Ferraro, B.Eng., EIT
Project Manager
GWE14-118-DTPLW R2

Vincent Ferraro, M.Eng., P.Eng.
Principal



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Ottawa, Ontario
(613) 836 0934

GRADIENT WIND ENGINEERING INC

PROJECT	4100 PONYTRAIL DRIVE, MISSISSAUGA QUALITATIVE PEDESTRIAN LEVEL WIND ASSESSMENT
SCALE	1:1400 (APPROX.)
DRAWING NO.	GWE14-118-DTPLW R2-1
DATE	JANUARY 9, 2015
DRAWN BY	K.A.

DESCRIPTION

FIGURE 1:
SITE PLAN WITH REFERENCE TAG LOCATIONS