

Issue No : 5
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**EXPERT EVALUATION REPORT
FOR REDEVELOPMENT OF
VICTORIA PARK SWIMMING
POOL COMPLEX**

Report Prepared by :
Allied Environmental Consultants Ltd.

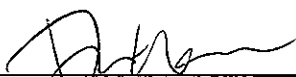
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TABLE OF CONTENT

LIST OF TABLES	5
LIST OF DIAGRAMS	5
LIST OF FIGURES	5
1. Introduction	7
1.1 Background	7
1.2 Surrounding Built Environment	8
2 Site Wind Availability Data	8
2.1 Wind Data from Hong Kong Observatory	8
2.2 Wind Data from MM5	11
3 Expert Evaluation	13
3.1 North-easterly winds	13
3.2 South-westerly winds	14
4. Conclusions	15

LIST OF TABLES

- Table 1** Site Wind Availability Data of North Point, HKO, Oct 98 – Sep 07, (Hourly 60-min wind)
- Table 2** Summary of the MM5 Wind Data for Grid (28, 24) of a Year
- Table 3** Summary of the Wind Velocity of the 8 Most Probable Wind Directions

LIST OF DIAGRAMS

- Diagram 1** North Point Annual Wind Roses (2004-2006)
- Diagram 2** Wind Rose of Grid (28, 24)

LIST OF FIGURES

- Figure 1** Site Location Plan
- Figure 2a-e** Development Layout Plans

AIM

To qualitatively evaluate the proposed design to advise any adverse effect on wind environment caused by the building structure to immediate local area.

SUMMARY

As the proposed redevelopment of Victoria Park Swimming Pool Complex is located within an open space, an air ventilation assessment is required in accordance with Technical Circular No. 1/06 Air Ventilation Assessment. An expert evaluation (EE) was carried out to evaluate the air ventilation condition of the surrounding environment in relation to the proposed redevelopment. In consideration of site constraints and practical use of proposed facilities, the Complex was designed to minimize the impact on air ventilation where optimum building disposition and height, streamline façades, openable windows and soft landscaping are incorporated. Significant impact on air ventilation is not anticipated. Therefore, further study on air ventilation is not necessary.

1. Introduction

In accordance with Technical Circular No. 1/06 Air Ventilation Assessment jointly issued by Housing, Planning and Lands Bureau and Environment, Transport and Works Bureau, proponent departments / bureaux or authorities should assess the need to apply Air Ventilation Assessment (AVA) to some categories of major government project during the planning stage. The redevelopment of Victoria Park Swimming Pool Complex falls within the category of “*Buildings with height exceeding 15metres within a public open space or breezeway designed on layout plans / outline development plans / outline zoning plans or proposed by planning studies*”. Allied Environmental Consultants Limited (AEC) has been appointed by the project architect, P&T Architects and Engineers Ltd. to undertake an air ventilation assessment for the redevelopment of Victoria Park Swimming Pool Complex.

During the preliminary design stage, an Expert Evaluation (EE) was carried out to evaluate the air ventilation impacts of the proposed redevelopment on the pedestrian wind environment. The purpose of EE are to identify good design features, any potential problem areas, mitigation measures and determine if further study should be carried out at later stage. This report presented the proposed development layout and details of EE.

1.1 Background

The subject site is at the junction of Hing Fat Street and Tsing Fung Street. It is surrounded by tennis courts and parks on the west, and residences on the east as shown on *Figure 1*. The total redevelopment area is around 1.8 hectares. The proposed Swimming Pool Complex will comprise the following facilities to be managed by Leisure and Cultural Services Department (LCSD):

1) Swimming Pool Complex

- One 50m x 25m indoor heated main pool with adjustable platform for water depth
- One 33m x 25m indoor heated multi-purpose pool with adjustable platform for water depth with diving platform and springboards
- One 10m² Jacuzzi
- Spectator stands on both sides for at least 2,500 spectators
- Ancillary and supporting facilities for holding competition events

The overall dimensions of the building are about 77m (along the east and west edges) x 131m (along north and south edges) x 23m to 25m (slanting roof with a curved façade design). *Figures 2a-2f* show the development layout plans.

2) Other facilities

- Redevelopment of the existing Victoria Park Swimming Pool Complex site into open space upon its demolition
- Re-provisioning of the existing park management office
- Re-provisioning of changing rooms with shower and toilet facilities for park users
- Re-provisioning of one handball court, two skating rinks, Tai Chi Area

1.2 Surrounding Built Environment

The street level around the subject site area ranges from 4mPD to 4.8mPD which is a flat area. The subject site locates on elevation of approximately 4.8mPD. The adjacent land use is predominantly residential buildings and Victoria Park. An educational institute is located to the east of the project area.

2 Site Wind Availability Data

Both weather data provided by Hong Kong Observatory and Mesoscale Model (MM5) published in the website of Planning Department are acceptable for assessment, as recommended in “*Technical Guide for Air Ventilation Assessment for Developments in Hong Kong*” published by Housing, Planning and Lands Bureau (HPLB) and Environment, Transport and Works Bureau (ETWB).

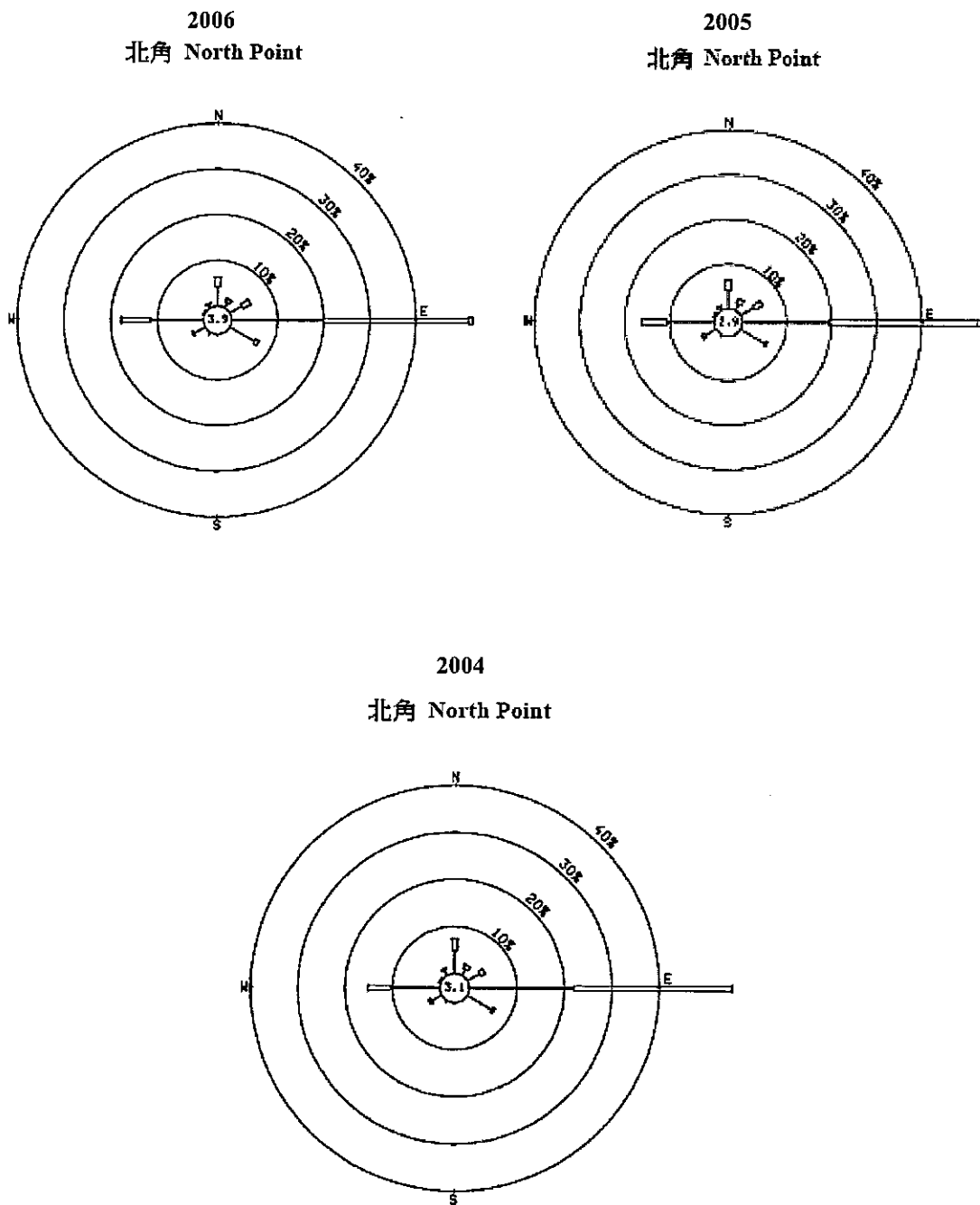
2.1 Wind Data from Hong Kong Observatory

The frequencies of occurrence of each wind direction through out a year was estimated with reference to Site Availability Data of North Point (the nearest anemometer station), Oct 1998 – Sep 2007, obtained from the Hong Kong Observatory (HKO) and shown in *Table 1*. Wind would mostly come from north-east sector throughout a year whereas in summer (Jun – Aug), wind from south-west section also attributes a significant portion other than that from north-east section.

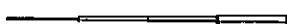
Table 1 Site Wind Availability Data of North Point, HKO, Oct 98 – Sep 07, (Hourly 60-min wind)

Wind Direction	Frequency of Occurrence (Dec – Feb)	Frequency of Occurrence (Mar – May)	Frequency of Occurrence (Jun – Aug)	Frequency of Occurrence (Sep – Nov)
N	7.0%	2.0%	0.6%	6.6%
NNE	4.0%	1.2%	0.8%	4.1%
NE	5.0%	2.9%	2.1%	6.5%
ENE	29.8%	35.4%	18.8%	31.9%
E	31.9%	31.3%	22.7%	31.1%
ESE	3.7%	2.6%	3.8%	1.4%
SE	0.8%	0.4%	0.8%	0.3%
SSE	0%	0.2%	0.5%	0.1%
S	0%	0.6%	1.2%	0.2%
SSW	0.1%	0.7%	1.6%	0.1%
SW	2.5%	4.1%	7.7%	2.0%
WSW	1.6%	6.1%	16.8%	2.7%
W	1.6%	7.7%	19.8%	3.8%
WNW	0.3%	0.3%	0.4%	0.4%
NW	2.8%	0.8%	0.4%	1.8%
NNW	6.4%	1.5%	0.6%	4.8%

Diagram 1 North Point Annual Wind Roses (2004-2006)

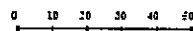


圖例：
 Legend :



0.1 - 3.2	3.3 - 8.2	8.3 - 14.2	> 14.2	米/秒 m/s
1 - 2	3 - 4	5 - 6	> 6	蒲福氏風數 Beaufort force

風速 Wind Speed



小圓內的數字表示出風向及風向不定之情況的頻率百分比。
 The number in the inner circle is the percentage frequency of occurrence of calm and variable winds.

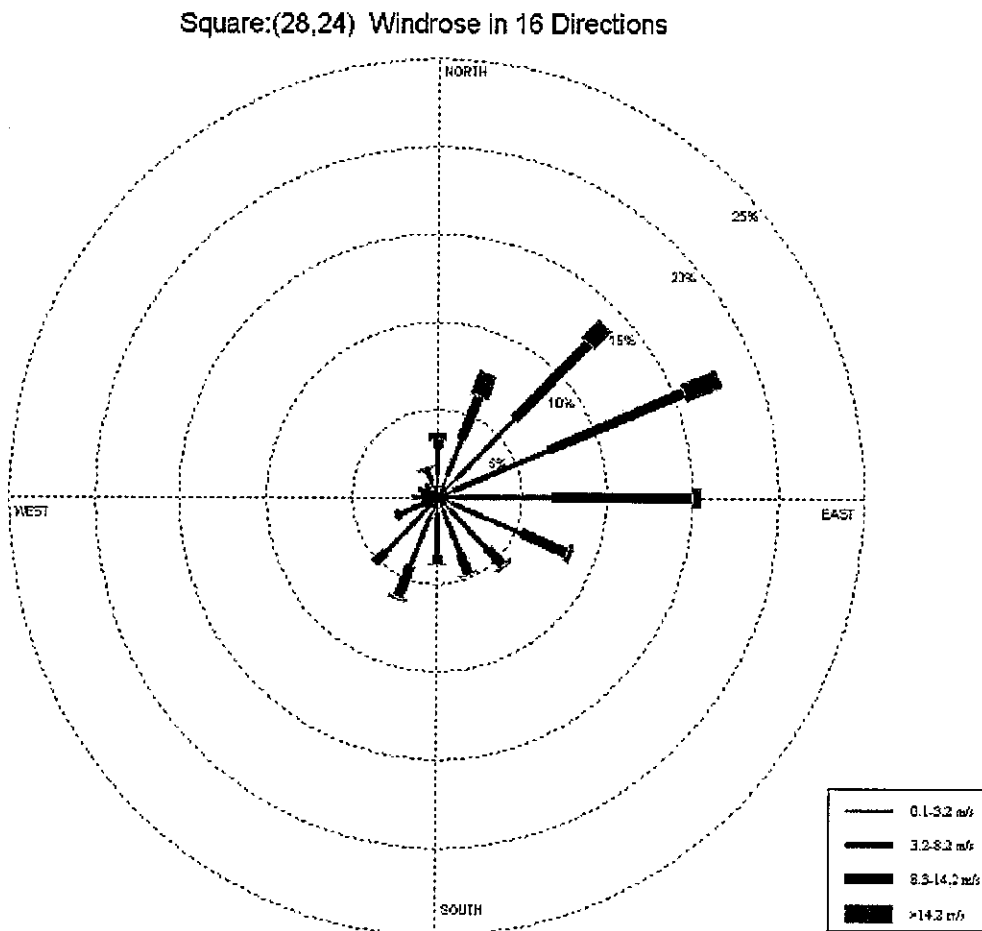
頻率百分比 Percentage Frequency

The mean speed measured at HKO North Point Station is around 11.86km/hr according to the Meteorological and Tidal Observations in Hong Kong 2004-2006. The most prevailing wind direction is from the East.

2.2 Wind Data from MM5

The assumption of wind data refers to the "Site Wind Availability Data" published by the Planning Department which is simulated by Fifth-Generation NCAR/ Penn State Mesoscale Model (MM5). It indicates wind velocity ranges from 0 to 22m/s from 16 wind directions, predicted at the nearest grid (28, 24) to the site and at 596m above the terrain level. The eight most probable wind directions which exceed 75% of a year at this grid are summarized in *Table 2* and the wind velocity was summarized in *Table 3*.

Diagram 2 Wind Rose of Grid (28, 24)



Note: Height of wind rose resolved is 596mPD.

Table 2 Summary of the MM5 Wind Data for Grid (28, 24) of a Year

Prevailing Wind Direction	Degree of Wind Direction	Probability
N	0°	3.6%
NNE	22.5°	7.6%
NE	45°	13.7%
ENE	67.5°	17.7%
E	90°	15.3%
ESE	112.5°	8.4%
SE	135°	5.5%
SSE	157.5°	4.7%
S	180°	3.8%
SSW	202.5°	6.2%
SW	225°	5.2%
WSW	247.5°	2.7%
W	270°	1.5%
WNW	292.5°	1.2%
NW	315°	1%
NNW	337.5°	1.8%

Table 3 Summary of the Wind Velocity of the 8 Most Probable Wind Directions

Velocity infinity (m/s)	NNE	NE	ENE	East	ESE	SE	SSW	SW
0 to 1	0.002	0.002	0.002	0.002	0.001	0.001	0.002	0.052
1 to 2	0.005	0.004	0.003	0.002	0.003	0.003	0.004	0.001
2 to 3	0.006	0.006	0.003	0.005	0.004	0.005	0.004	0.002
3 to 4	0.005	0.009	0.007	0.007	0.006	0.005	0.006	0.002
4 to 5	0.006	0.011	0.014	0.011	0.006	0.005	0.004	0.004
5 to 6	0.004	0.01	0.01	0.013	0.009	0.006	0.006	0.008
6 to 7	0.004	0.007	0.014	0.011	0.011	0.009	0.008	0.01
7 to 8	0.005	0.011	0.013	0.015	0.01	0.007	0.005	0.008
8 to 9	0.005	0.009	0.015	0.013	0.011	0.004	0.005	0.007
9 to 10	0.006	0.009	0.011	0.019	0.01	0.004	0.007	0.005
10 to 11	0.006	0.01	0.013	0.018	0.006	0.003	0.004	0.002

Velocity infinity (m/s)	NNE	NE	ENE	East	ESE	SE	SSW	SW
11 to 12	0.005	0.01	0.016	0.018	0.002	0.002	0.002	0.001
12 to 13	0.003	0.012	0.018	0.01	0.002	0.001	0.001	0.001
13 to 14	0.003	0.01	0.014	0.005	0.001	0	0.001	0.001
14 to 15	0.003	0.006	0.008	0.003	0	0	0	0
15 to 16	0.003	0.003	0.005	0.001	0.001	0	0	0
16 to 17	0.003	0.002	0.002	0.001	0	0	0	0
17 to 18	0.002	0.001	0.002	0	0	0	0	0
18 to 19	0.001	0.001	0.002	0	0	0	0	0
19 to 20	0.001	0.001	0	0	0.001	0	0	0
20 to 21	0	0.001	0.001	0	0	0.001	0	0
21 to 22	0	0	0.001	0	0	0	0	0
22 to 23	0	0	0.002	0	0	0	0	0

The mean speed predicted at the nearest grid by MM5 is around 7.54m/s according to the provided wind speeds and wind probabilities. The most prevailing wind direction is of East-North-East. There is also a major component from North-East.

3 Expert Evaluation

For the predominant wind directions, the interaction between the wind and the building morphology in the area was considered. Important features taken into account include the distances between the proposed building and other existing buildings, their built-forms, overall heights and bulk as well as the landform.

3.1 North-easterly winds

3.1.1 With reference to the wind data, prevailing north-easterly winds contribute more than 50% of a year. The subject site is located at a downstream area where residential block clusters are sited at the east and north-eastern sides of the site.

3.1.2 The tennis courts, basketball court and football fields located immediately south-west i.e. downstream to the site are part of the large open spaces in Victoria Park; winds could be captured from northern waterfront. Moreover, the swimming pool complex has window openings of 2m high along east and west facades (along the spectator's stand) and north

facade (at pool deck level), the aggregate openable area is about 80% of the upper first floor facade. Therefore the obstruction of north-easterly wind to the south-western area due to the proposed complex is not likely.

- 3.1.3 Comparing to existing condition, the positioning of building could minimize the impact of ventilation performance with due consideration of the wind environment. Instead of siting the proposed swimming pool complex at the existing swimming pool location, it is shifted to the south to allow longer separation distance from the structure of elevated road and Tsing Fung Street, which can benefit the ventilation and the dilution of pollutants from road traffic. The proposed complex is also situated at a lower ground of the site, which shall minimize the block of prevailing wind to the recreational area at south-west.
- 3.1.4 In consideration of design constraints and practical use of facilities within the proposed complex, building height will be kept at a low-rise level (i.e. 23m to 25m above ground). Significant obstruction of prevailing wind flow into downstream area is not anticipated.
- 3.1.5 Apart from buildings at Hing Fat Street, there are buildings and ball courts located to the south of Causeway Road with more than 100m from the site. As the proposed swimming pool complex is an isolated low-rise building at the boundary of a large open space in Victoria Park, the obstruction of wind penetration to downstream area is not anticipated.
- 3.1.6 The proposed redevelopment includes the construction of swimming pool complex as well as soft landscape areas. The existing trees on site will be retained where possible. Tall trees with wide and dense canopy could maximize the pedestrian comfort. In consideration of hygiene, safety and health of swimmers, extensive planting on roof is not practical. However, planting at the perimeter of roof will be provided to maximize the greening on site.

3.2 South-westerly winds

- 3.2.1 Summer wind from south-west section attributes a significant portion besides the prevailing east and north-easterly winds. Under south-westerly winds, the flat topography of hand ball court and skating rink to the immediate north and basketball court to the south of the proposed complex allows airflow to reach Tsing Fung Street and Hing Fat Street. It is expected that the ventilation impact of impediment is minimized.

4. Conclusions

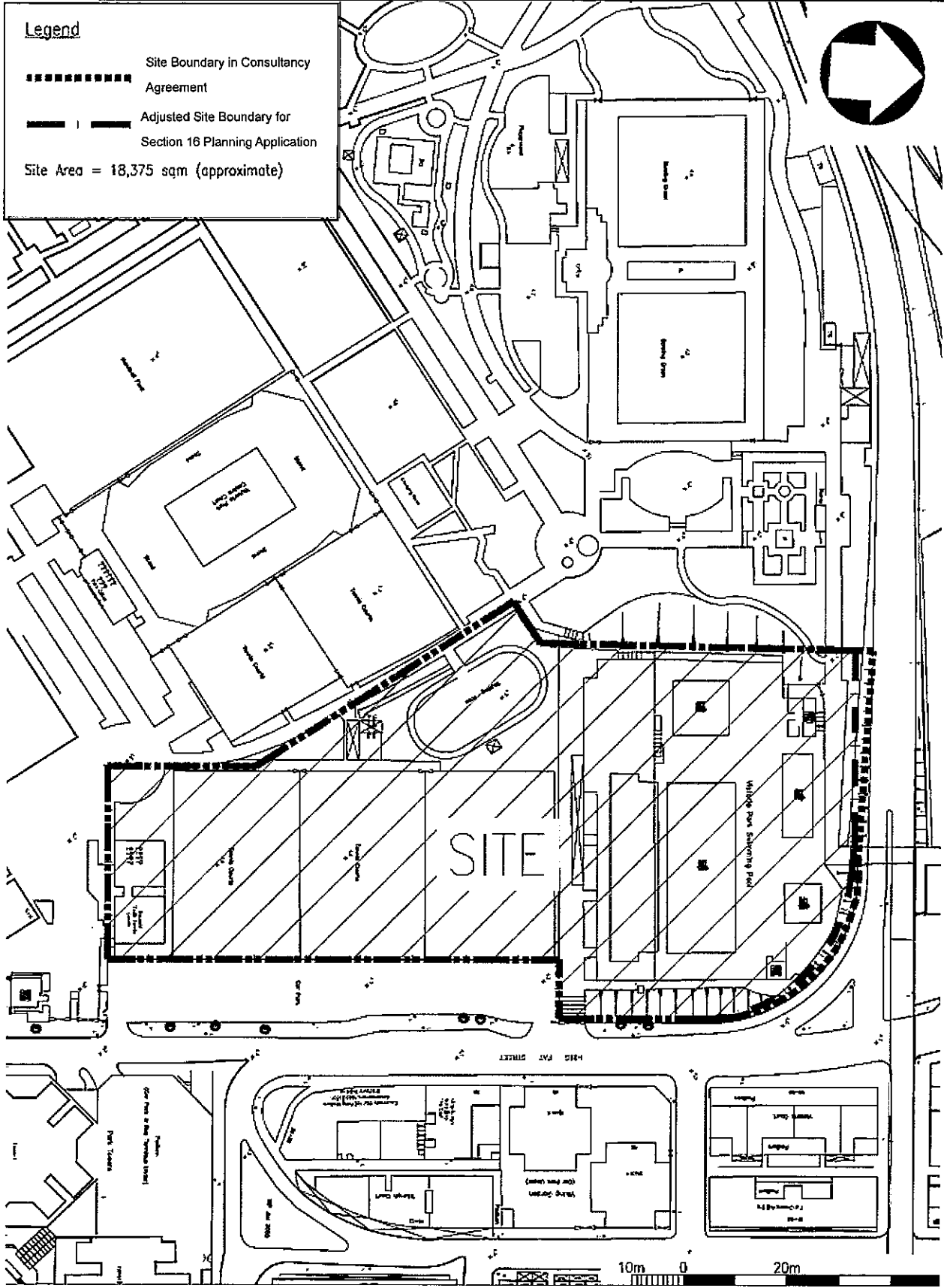
An Expert Evaluation has been carried out in accordance to ETWB Technical Circular No. 1/06 Air Ventilation Assessment (AVA) and Chapter 11 of the Hong Kong Planning Standards and Guidelines (HKPSG) for the purpose of air ventilation assessment. This summary presents findings of Expert Evaluation. In conclusion, the current design has been developed with due consideration of air ventilation impact. Impact on air ventilation performance at pedestrian area due to the proposed development is considered insignificant. Therefore, further study on air ventilation is not necessary.

Legend

Site Boundary in Consultancy Agreement

Adjusted Site Boundary for Section 16 Planning Application

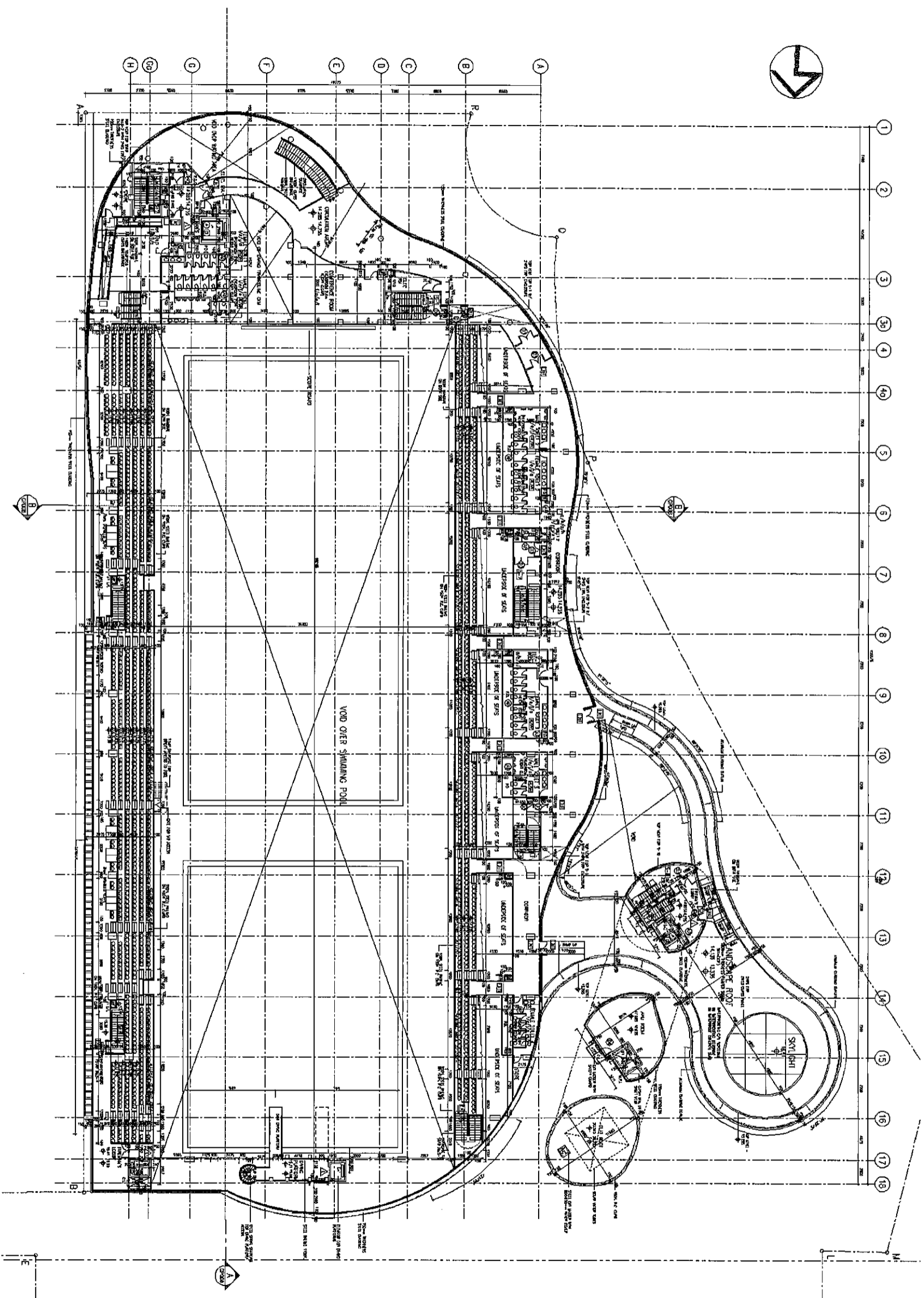
Site Area = 18,375 sqm (approximate)



REDEVELOPMENT OF VICTORIA PARK SWIMMING POOL COMPLEX
AIR VENTILATION STUDY - EXPERT EVALUATION
 Site Location

Figure No.	Rev.
1	0
Scale	Date
NTS	11/08



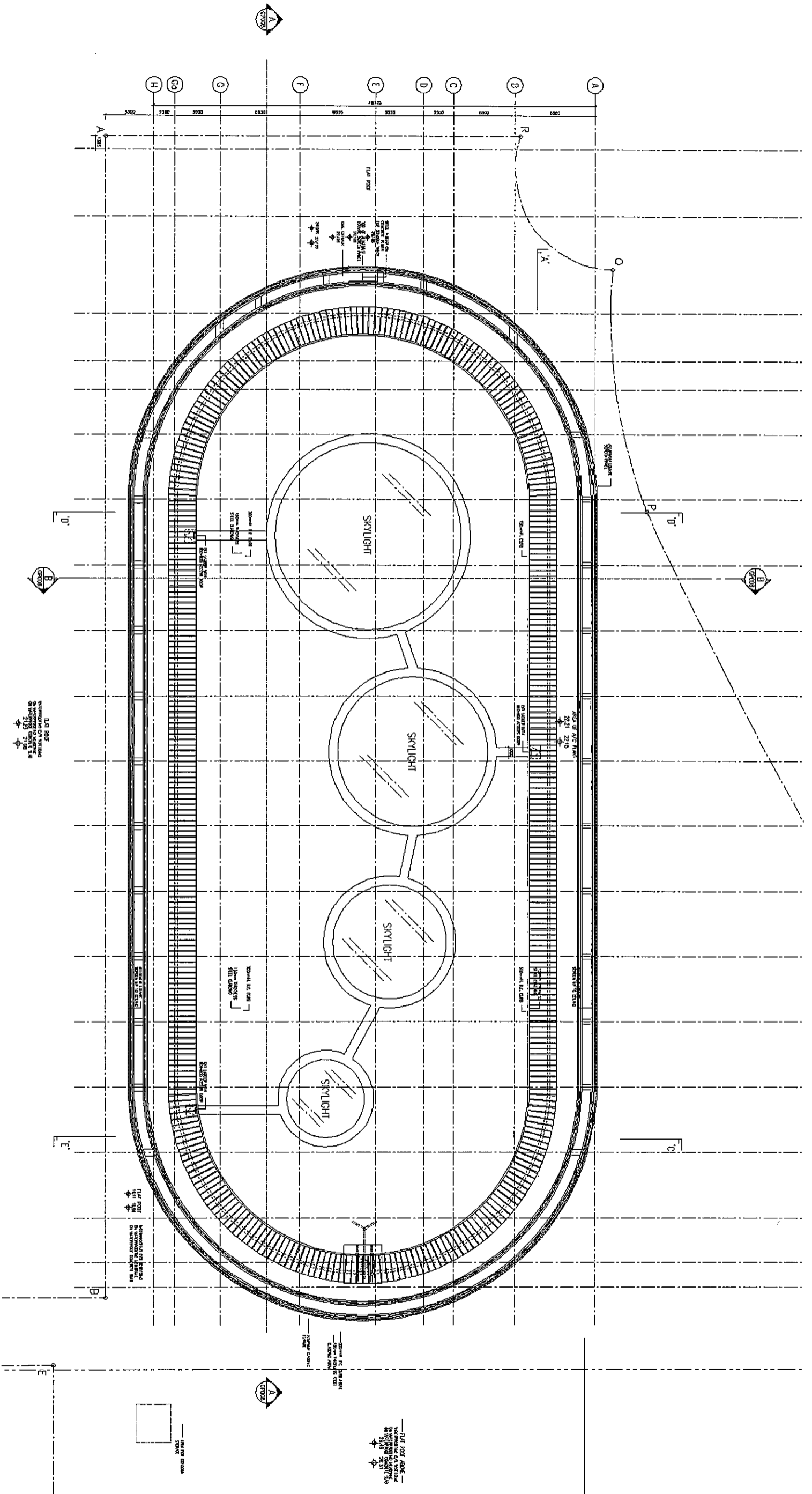


REDEVELOPMENT OF VICTORIA PARK SWIMMING POOL COMPLEX
AIR VENTILATION STUDY - EXPERT EVALUATION

Level 1 Layout Plan

Figure No.	Rev.
2a	0
Scale	Date
NTS	07/08



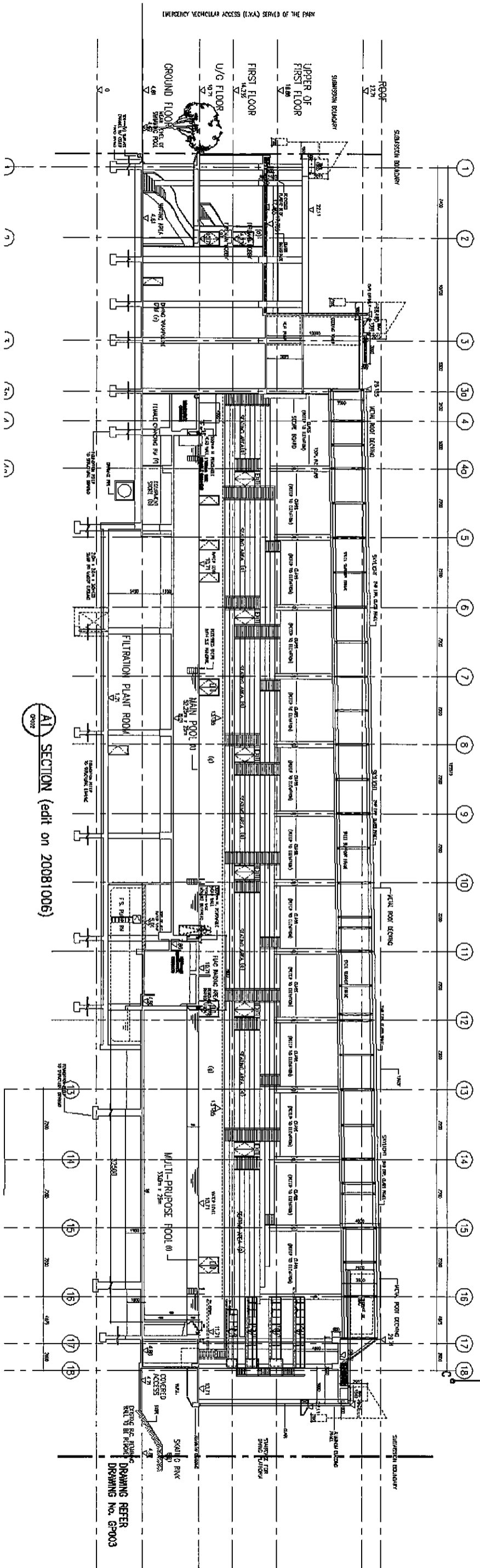


REDEVELOPMENT OF VICTORIA PARK SWIMMING POOL COMPLEX
AIR VENTILATION STUDY - EXPERT EVALUATION

Roof Layout Plan

Figure No.	Rev:
2c	0
Scale	Date
NTS	11/08



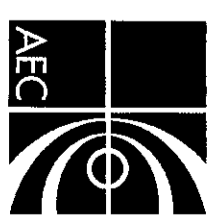


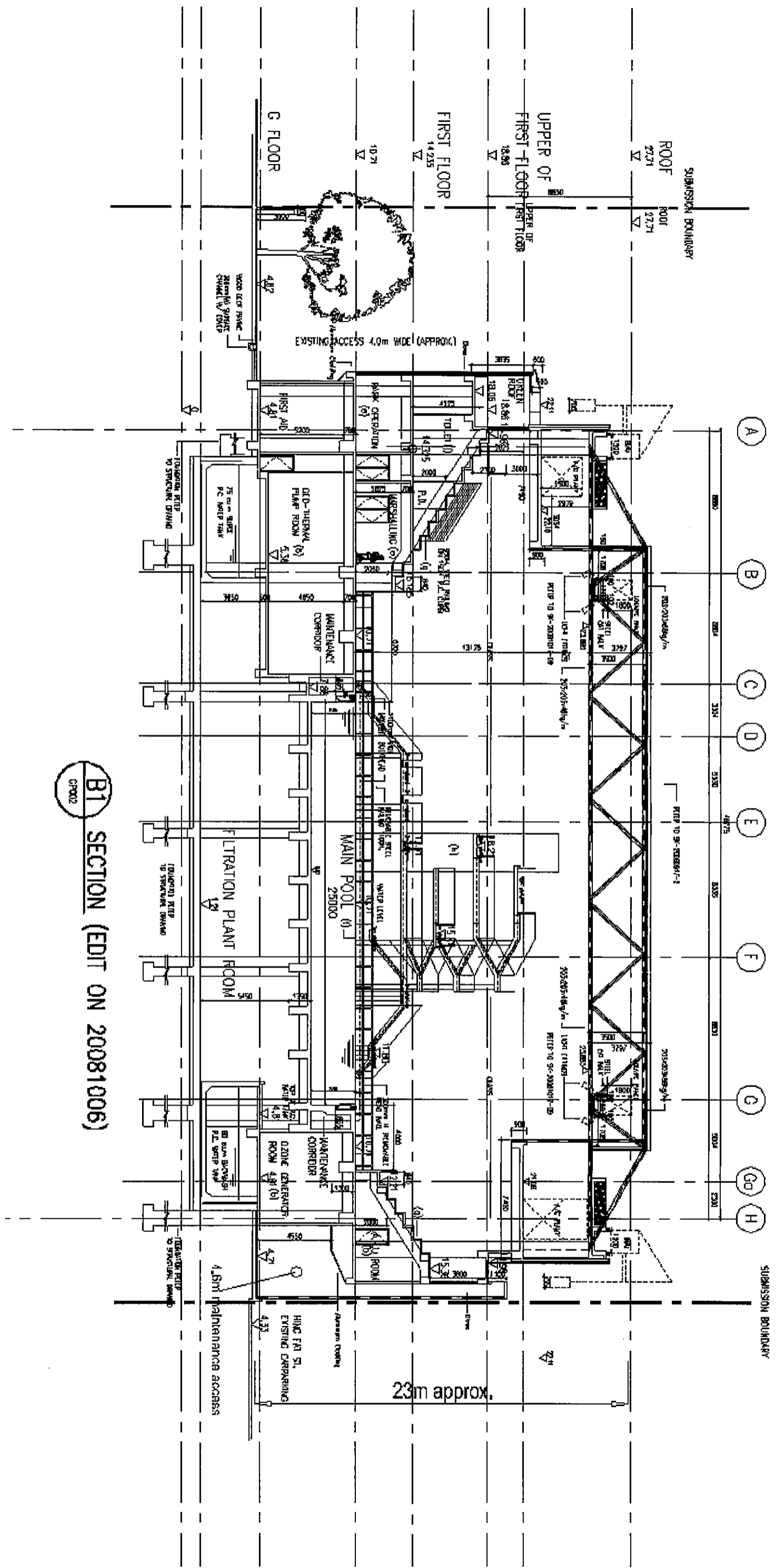
A1 SECTION (edit on 20081006)

REDEVELOPMENT OF VICTORIA PARK SWIMMING POOL COMPLEX
AIR VENTILATION STUDY - EXPERT EVALUATION

Section Plan 1

Figure No.	Rev.
2d	0
Scale	Date
NTS	11/08





B1 SECTION (EDIT ON 20081006)

REDEVELOPMENT OF VICTORIA PARK SWIMMING POOL COMPLEX
AIR VENTILATION STUDY - EXPERT EVALUATION

Section Plan 2

Figure No.	Rev.
2e	0
Scale	Date
NTS	11/08

