Appendix 19.2 – Assessment Methodology

Assessment Methodology and Significance Criteria

Windiness Criteria and Sensitive Receptors

The criteria used to describe windiness in this study are those of T.V. Lawson LDDC[1]. The acceptability of windiness is subjective and depends on a number of factors, most notably the activities to be performed in the area being assessed. The Lawson criteria describe acceptability for particular activities in terms of 'comfort' and 'distress' (or safety). The criteria are relevant for assessing long term use on a local scale for low to medium sensitivity users (i.e. able-bodied users). Acceptable conditions for various activities in order of increasing windiness are described in Table A19.1.

Table A19.1: Comfort criteria as defined by TV Lawson	
Comfort Criterion	**Description**
'Sitting': Long term sitting	Reading a newspaper, eating and drinking
'Standing': Standing or short term sitting	Bus stops, window shopping and building entrances[(a)] and parks
'Strolling': Walking or strolling	General areas of walking and sightseeing
'Business walking': Business walking	Areas where people are not expected to linger

[(a)] The use of this criterion for entrances is to avoid difficulties with maintaining balance when transitioning from a sheltered indoor location.

The conditions described above are the limiting tolerable criteria for comfort. For ideal conditions, the windiness in an area with a known activity will be a category better (i.e. tolerable conditions at a building entrance will be in the 'Standing' range but ideal conditions will be in the 'Sitting' range). For more sensitive activities, such as regular use for external eating, conditions should be well within the 'Sitting' category.

The comfort criteria above describe more frequent wind conditions. There is also a distress criterion for 'General Public Access', equivalent to a mean speed of 15 metres per second (m/s) and a gust speed of 28 m/s (62 miles per hour (mph)) to be exceeded less often than once a year. Exceeding this limit signifies a safety hazard for less able-bodied members of the public (e.g. elderly and cyclists). Conditions in excess of this limit may be acceptable for

[1] Lawson, T.V. 'The evaluation of the windiness of a building complex before construction: London Docklands Development Corporation', 1990

optional routes and routes which less physically able individuals are unlikely to desire to use in windy weather.

There is a further limiting distress criterion within which even 'able-bodied' individuals may find themselves in difficulties at times. This corresponds to a mean speed of 20 m/s and a gust speed of 37 m/s (83 mph) to be exceeded less often than once a year. Beyond this gust speed, aerodynamic forces are likely to exceed body weight, where it becomes difficult for most to remain standing. Such speeds may also affect the safe operation of some road vehicles, particularly unloaded goods vehicles. The pedestrian safety criteria are provided in full in the Table A19.2.

Table A19.2: Distress (safety) criteria as defined by TV Lawson	
Distress criterion	**Description**
'General Public Access'	Above which the less able and cyclists may at times find conditions physically difficult
'Able-Bodied Access'	Above which it may become impossible at times for an able bodied person to remain standing.

Wind Climate in Cardiff

The annual wind rose from St Athan Airport located 19km to the south-west of the Site is shown in Figure 19.1 (Appendix 19.3). This wind rose represents the wind characteristics (direction and strength) across all times of day and all seasons. The wind climate at this meteorological station is representative of the wind climate in Cardiff and is generally similar to the rest of the UK.

The most frequent and strongest winds at all times of the year in the UK blow from a quadrant centred on west southwest (240°E of N). These winds are relatively warm and wet. Almost all cases of serious annoyance due to strong winds around buildings are caused by winds from this direction.

During spring, northeast winds are almost as common as the west southwest winds but are weaker. Northeast winds are relatively cold and dry. These winds are often associated with poor internal conditions due to cold air infiltrating through doors.

Winds from the northwest can be as strong as the west southwest winds but are less frequent.

Southeast winds are generally warm and light and are rarely associated with annoying ground level winds.

Cardiff is particularly exposed to the westerly prevailing winds due to its location on the west coast of the UK.