Leeds CITY COUNCIL

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Report of the Chief Planning Officer

CITY PLANS PANEL

Date: 20th November 2014

Subject: PROPOSED WIND MITIGATION SCHEME AT BRIDGEWATER PLACE, WATER LANE (APP. REF. 14/04554/FU).

APPLICANT	**DATE VALID**	**TARGET DATE**
CPPI Bridgewater Place General Partners Ltd	31st July 2014	30th October 2014

Electoral Wards Affected:

City and Hunslet

YES Ward Members consulted

Specific Implications For:

Equality and Diversity ☐

Community Cohesion ☐

Narrowing the Gap ☐

RECOMMENDATION: Grant Planning permission subject to the conditions listed below:

Conditions

1. A programme for the implementation of the development hereby approved, including timescales for the completion of the works and post-completion monitoring of the effectiveness of the works, shall be submitted for the written agreement of the Local Planning Authority within 3 months of the date of this decision. The development shall be completed as thereby approved.

2. A scheme for the monitoring of the wind environment to be submitted in accordance with the timescales agreed pursuant to condition 1, for the purposes of reconsidering the existing road closure protocols and assessing the effectiveness of the mitigation measures, shall be submitted to and agreed in writing by the Local Planning Authority. The scheme shall incorporate details of further mitigation measures where these are found to be necessary by the monitoring exercise.

3. Prior to the implementation of the approved works, a management protocol for the operation of the access doorway in the screen to the north-west of the building, at ‘testing location point 90’, shall be submitted to and approved in writing by the Local planning Authority. The protocol shall be implemented as thereby approved.

4. The development hereby permitted shall be carried out in accordance with the approved plans listed in the Plans Schedule.

5. Prior to the commencement of development, typical elevations, sections and details, at scale 1:20, of the baffles to be constructed over Water Lane, to include:
   - shape of support columns
   - colour and finish of support columns
   - perforated metal to be used to clad the baffle, to include surface finish, the pattern of the perforation and wind test results of a full sized panel to demonstrate that the design would not cause any unacceptable noise issues.
   - size of panel and jointing detail of the baffle material panel
   - method, location and colour of the feature lighting

   shall be submitted to and approved in writing by the Local Planning Authority. The baffles shall be constructed in accordance with the approved details unless otherwise agreed in writing by the Local Planning Authority.

6. Prior to the commencement of development, elevations, sections and details at scale 1:20 of the canopy to be constructed along the northern elevation of Bridgewater Place, to include:
   - shape of support columns
   - colour and finish of support columns and horizontal struts
   - glazing panels, including method of fixing

   shall be submitted to and approved in writing by the Local Planning Authority. The canopy shall be constructed in accordance with the approved details unless otherwise agreed in writing by the Local Planning Authority.

7. Prior to the commencement of development, elevations, sections and details at scale 1:20 of the screens and canopy to be constructed along the western elevation of Bridgewater Place and the screen to the south of the building, to include:
   - cross-sectional detail of support structure edge
   - colour and finish of support structure
   - perforated cladding metal, to include surface finish, the pattern of the perforation and wind test results of a full sized panel to demonstrate that the design would not cause any unacceptable noise issues
   - size of panel and jointing detail of the metal cladding panel

   shall be submitted to and approved in writing by the Local Planning Authority. The screens and canopy shall be constructed in accordance with the approved details unless otherwise agreed in writing by the Local Planning Authority.

8 No part of the structures hereby approved shall be used for the location of any advertisements whatsoever.

9 The local planning authority shall be notified in writing immediately where unexpected significant contamination is encountered during any development works and operations in the affected part of the site shall cease. Where remediation of unexpected significant contamination is considered by the Local Planning Authority to be necessary, a Remediation Statement shall be submitted to and approved in writing by the Local Planning Authority prior to the recommencement of development on the affected part of the site. The Remediation Statement shall include a programme for all remediation works and for the provision of verification information. Remediation works shall be carried out in accordance with the approved Remediation Statement. On completion of those works, the Verification Report(s) shall be submitted to the Local Planning Authority in accordance with the approved programme. The site or phase of a site shall not be brought into use until such time as all necessary verification information has been approved in writing by the Local Planning Authority. To enable the local planning authority to ensure that unexpected contamination at the site will be addressed appropriately and that the development will be suitable for use in accordance with policies Land 1 of the Natural Resources and Waste Local Plan 2013 and GP5 of the Unitary Development Plan Review 2006.

1.0 INTRODUCTION:

1.1 Members will recall receiving a presentation in January 2014 from the project team regarding the scheme to mitigate the wind impact of Bridgewater Place (the minutes of this meeting are attached at the end of this report). Since this time the scheme has been developed including the carrying out of wind tunnel testing as well as establishing the location of underground utilities which impact on the ability to locate structures in the highway. This has resulted in a reduction from 4 no. baffles over Water Lane, as presented at pre-application stage, to 3 no. baffles submitted as part of this application.

2.0 PROPOSAL

2.1 The proposed wind mitigation scheme is the combination of testing a large number of mitigation options and is considered to be the most effective option that can be delivered within the physical constraints of the site. It is referred to as option 6C in the submitted wind report, which will be referred to in greater detail below, and comprises 4 main components (a schematic diagram of these is included in the page immediately after the conclusion of this report):

2.2.1 <u>A Canopy to the base of the building fronting Water Lane:</u>

This is a glazed structure on 10 no. support columns and would extend a minimum of 7m from the face of the building running the full width of the northern elevation to Water Lane, including the radius of the tower. The canopy is attached to the existing structure at a limited number of points to provide lateral restraint, thereby reducing the number of columns to a minimum. The canopy is then cantilevered off these columns and supported on a series of horizontal arms which taper to their outer limit. It is proposed to be located at the equivalent of second storey level where the glazed lower floors give way to the masonry upper floors.

2.2.2. <u>3 no. Baffles over Water Lane</u>

Three wind baffles are to be located across Water Lane, each measuring approximately 4m deep and a minimum of 6m above the carriageway resulting in a

total height of approximately 10m. Two of the baffles would be approximately 20 m long with the eastern most being approximately 25m long. They would be located at a slight angle to the direction of traffic flow in order to maximize their wind mitigation impact. Each baffle would consist of a tapering aircraft wing-like section covered on its windward side in a 50% solid perforated metal skin. This perforation is described as 'porous' in the wind report, which refers to the fact that the perforations allow some of the air to pass through, thereby dissipating the impact of the wind and avoiding sharp changes in wind speed around its edges. The baffles will be a natural mill finish of marine grade aluminium, rather than painted, in order to keep future maintenance to a minimum.

2.2.3 Vertical and horizontal screens and canopy to the north-western elevation

A series of 4 no. vertical screens are to be placed on the north-western elevation of the building varying in height between 12m & 18m. These are linked by a horizontal canopy located above the residential and car parking entrances and over the sandwich shop 'Panini Shack'. These structures will be erected around steel frames and again clad in the porous marine grade aluminium. These are designed to deflect the down-wash from the wind hitting the western side of the building and stop it from being channelled around the front of the building. An opening will be located at the base of the north-western screen to allow more direct pedestrian access around the base of the building and through to the residential and commercial entrances. In addition the existing abrupt change in levels and glass balustrade are being removed from this area and the ground will be one continuous surface treatment which would result in a much more generous public circulation area of minimum 7m width. These changes would account for the location of existing doors.

2.2.4 A Screen at the southern end of Bridgewater Pl adjacent The Grove Public House

A further screen adjacent The Grove public house approximately 5.5m high and also covered in the porous metal material. This is L-shape in plan, is set well back from the main pedestrian thoroughfare and will be read in the context of The Grove gable end wall and the lower recessed floors of Bridgewater Place. The screen would also contain a door to accommodate the existing fire escape route. This counters potential significant wind speeds in this area due to the particular configuration of the gaps between the buildings and along Back Row, relative to the predominant wind direction at this point.

2.3 Related Highways Works

2.4 The baffles are proposed to be located in the public highway. However, there are a number of utilities which are located in the ground in this area, the most notable of which is a large culvert for Hol Beck which passes beneath Water Lane. The proposed location of the support columns must avoid the existing utilities and culvert which limits their siting. For this reason, the baffle support columns on the northern side of Water Lane have to be located in, what is currently, the carriageway, with the kerb being realigned to accommodate this. This would reduce the length of the current tapered left-turn lane from Water Lane into Neville St, although a dedicated, but shorter, lane would remain. This arrangement also ensures that the pedestrian footway and cycleway is retained to the east of Canal Wharf and that there is a clear public footpath available to the west of Canal Wharf.

2.5 Along the carriageway edge, the deeper and more robust 'Trieff' curbing is proposed to be introduced along this length of the highway, as well as pedestrian guard-railing. This would perform the double function of protecting the support columns of the free-standing baffles as well as helping to channel pedestrians towards the

realigned pedestrian crossing facility. The baffles also require supports to be provided between the 2 carriageways and a central reservation has now been introduced to accommodate these structures which would also be protected by the Trieff curbing.

2.6 The baffles are located close to a number of junctions: the Water Lane/Victoria Rd junction, the access road to Bridgewater Pl servicing and basement car park and Canal Wharf. There are also pedestrian footways and pedestrian crossings in this area. The baffles have been designed to allow the necessary vehicle, pedestrian and cycle movements to take place unhindered, including the preservation of adequate sight lines. Street lighting will be considered at detailed highways design stage to ensure necessary areas are lit and avoid shadows being cast by the structures

2.7 The issue of potential noise generation by the baffles has been considered, particularly as they are constructed of perforated metal. The following are likely to be included in the design in order to reduce the potential for noise generation to a minimum: small round perforations with smooth edges; gaps between the surface panel to be closed; removal of sharp edges. Aero-acoustic wind tunnel testing has been recommended to validate the final choice of material to reduce as much as possible the likelihood of wind related noise, although at this stage no such testing has been carried out in specific relation to this scheme.

2.8 The structures are in the public highway, however, the responsibility for maintenance of the structures rests with the applicant and the details of this would be resolved and secured through a S278 Agreement under the Highways Act.

2.9 Submitted Documents

A number of documents have been submitted in support of the proposal:

1. Wind Assessment
2. Transport Assessment
3. Flood Risk Assessment
4. Contaminated Land Statement
5. Acoustics Summary
6. Road Safety Audit Designer's Response
7. Approval In Principle Form (Highways works)
8. Statement of Community Involvement
9. Coal Mining Report

3.0 SITE AND SURROUNDINGS:

3.1 The site is a landmark tower building (up to 32 storeys high) located on a main gateway to the south of the city centre. It houses a variety of convenience uses at ground level arranged around a central covered atrium space including shops and cafes. Within the upper floors it provides a mixture of 21,000 sqm of office space and over 200 residential apartments in the upper 20 floors.

3.2 The site is located at the junction of Water Lane and Victoria Road and lies in a mixed use commercial area to the south side of the River Aire. Immediately to the west and south is the former Halifax call centre building and the Grove Inn public house respectively. The Grove Inn public house appears to have residential accommodation at first floor level with associated windows and a small terrace facing the site.

3.3 Immediately to the north, across Water Lane lies the Canal Wharf Conservation Area which comprises a number of former warehouse and mill buildings including some listed buildings now in office and other commercial uses, as well as the Granary Wharf residential, hotel and commercial development. To the east across Victoria Road is the Asda headquarters building.

3.4 Water Lane and Victoria Road comprise busy highways in the vicinity of the site. The building is separated from the surrounding highways by a large forecourt sweeping around its northern edge with a servicing and delivery area to the west which contains access to the basement car parking. The site is located within flood zone 2.

4.0 RELEVANT PLANNING HISTORY

4.1 Planning permission was originally granted on 22nd November 2001, app. ref. 20/337/00/FU, for part 30 and part 8 storey building comprising 190 bed hotel, residential accommodation, office use, restaurant and bar uses with basement car parking.

- A revised planning application seeking an amendment to the above consent, in particular for the substitution of the proposed hotel use with an office use, was approved on 26th Feb 2002 app. ref. 20/407/01/FU.

- Further revised application, seeking reconfiguration of the basement car parking and minor change to the siting and elevations of the building, approved 7th November 2003 app. ref. 20/313/03/FU

- Further revision, for increasing the number of proposed flats through internal reconfiguration, was granted in 2004 app. ref. 20/339/04/FU (this is the scheme that was implemented).

4.2 A wind assessment had been required by condition prior to the building being constructed on all of the consents and this was carried out by BRE Ltd but did not identify any unacceptable impacts or required design modifications. Therefore, no design modifications were made to the building.

4.3 An earlier iteration of the emerging wind mitigation proposals were presented to city Plans Panel on 16th January 2014. Members were satisfied that all potential wind issues around the site had been considered and with the extent of the area covered by the wind study, but noted that they would only have certainty on the effectiveness of the measures once they were in place. (The minutes of this meeting are attached at the end of this report)

4.4 The Local Planning Authority issued a screening opinion in May 2014 stating that an Environmental Impact Assessment for the development would not be necessary when assessed under Part 2 of the Town & Country Planning (Environmental Impact Assessment) Regulations 2011

4.5 The Council is currently erecting a pedestrian screen under its permitted development rights (with the works approved by Executive Board in February 2014) on the eastern footway of Victoria Road, which is an interim measure to provide shelter for diverted pedestrians in high winds. It is expected that these works will become redundant once the wind mitigation scheme is in place, but this will be

subject to monitoring of the effectiveness of the comprehensive wind mitigation scheme as set out in the conditions above.

5.0 HISTORY OF NEGOTIATIONS

5.1 The current problems which are experienced in relation to high winds around the site began to be reported soon after the building was completed in 2007. The Council received a number of complaints and some very serious incidents have occurred in relation to the pedestrian wind conditions around the building.

5.2 In response to this situation an independent specialist wind consultant – CPP Wind- was appointed jointly by the Council, the building developers and the building owners to identify a permanent solution to the problems. The wind modeling work which has been undertaken has demonstrated that the unacceptable wind conditions are attributable to the development.

5.3 In addition, Leeds City Council appointed wind experts Buro Happold to advise on the appropriateness and validity of the wind testing being undertaken by CPP Wind and to advise the Council on the most appropriate solution to address concerns within the highway.

5.4 CPP wind tested various canopy designs through wind tunnel modeling. However, although the canopy proposals demonstrated improved conditions for the public in the immediate vicinity of Bridgewater Place, none of the options put forward materially improved conditions within the highway.

5.5 As a result of this, and being insistent that a holistic solution be found to all the wind problems in the area resulting from the development of Bridgewater Place, the Council commissioned Buro Happold to look more broadly at further options not previously considered. Buro Happold undertook a computer based testing method (as distinct from actual wind tunnel testing) on a number of scenarios during the summer of 2012 and identified a proposal which offered significant wind mitigation within all areas potentially affected by high wind speeds within the highway.

5.6 In order for this to be validated, the computer modeling test results underwent further wind tunnel testing at the CPP Wind facilities and this confirmed the validity of the proposal.

5.7 Tragically in March 2011 a 7.5t high-sided heavy goods vehicle was blown over in high winds adjacent to Bridgewater Place killing one pedestrian and seriously injuring another. The fatality was subject to a coroner's inquest. On 3 December 2013, following the Inquest, the coroner made recommendations which recognized that a possible wind mitigation solution had been identified, that the intention would be to deliver this solution as soon as possible and required that the building owner should take all steps to properly ameliorate the wind conditions created by the building.

5.8 The building owner appointed Chetwoods Architects and wind experts Buro Happold to develop the detailed design solution and to obtain the necessary planning consent. With Buro Happold’s appointment by the building owner the Council appointed a new independent wind consult (RWDI) to carry out a peer review of the submitted wind study.

5.9 In order to develop a successful wind mitigation scheme the site and surrounding buildings were modelled at a scale of 1:300 and subject to wind tunnel testing. The initial step was to test under the currently built situation in order to establish a base

position which could be used as a comparator. Under this condition a large number of test locations exhibit both uncomfortable conditions and fail the relevant distress criteria.

5.10 Over thirty possible mitigation schemes were tested to improve pedestrian wind conditions with one option (Option 6C) being developed further as it proved to be the most effective while remaining feasible within the constraints of the site and surrounding highways infrastructure. Wind speed measurements were made at 70 no. selected locations around the base of the building at the equivalent of 1.5m to 2.1m above the surface for 16 evenly spaced wind directions around the full 360 degree directional range.

6.0 PUBLIC/LOCAL RESPONSE:

6.1 The application was advertised on site by notice dated 8th August 2014 and in the press by notice dated 4th August 2014. No letters of representation have been received from members of the public. Ward Members were consulted on this application and no responses were received.

6.2 A letter has been received from the Leeds Civic Trust (LCT) who received a presentation from the developer team. They support the application in principle but made the following comments:

- the poor design of the glazed canopy over the entrance area to the building, the final proposal is the sort of thing that one would expect on a retail warehouse park or a railway station rather than a prestigious city centre office and residential complex
- the simple nature of the baffles over the road – while the Design & Access statement talks of imitating aircraft wings and tapers, the final result is still rather crude, with little tapering off at the ends
- the crude design of the support columns – the 'step' required to provide crash protection at the lower end will no doubt soon become a debris or litter trap (it is at a level suitable for leaving coffee cups or takeaway trays after use) and would be better designed away through provision of a tapered cone. This might also stop water pooling and so reduce maintenance costs
- as the pattern of perforations has potential to make a significant difference to the appearance, it should be given greater consideration at this stage
- there has been no discussion of the use of colour – could a theme be picked up from the bronze being used on the South Station Entrance?
- the lighting could be used to transform the structures and the long-term maintenance of this will be crucial
- the various structural elements will provide an attractive roosting place for birds and, unless this is tackled from the outset, the floor beneath could soon become both hazardous and unhygienic
- no advertising should be allowed on the baffles
- why is the pedestrian crossing staggered?
- the revised design should ensure that pavements are not obstructed at the junction with Canal Wharf where the Trans-Pennine Cycle Route runs along the footway.

6.3 The applicant carried out a public consultation exercise prior to submitting the planning application. Letters were sent to community stakeholders, neighbouring businesses, residents and other interested groups to invite them to a public exhibition event. In addition to the invitation, letters were sent to residents and stakeholders and a press release was issued to the local media. This received

coverage in the Yorkshire Post, BBC Radio Leeds, Look North, ITV Calendar, Radio Aire, Architects Journal and the Leeds City Council website. An advert was also placed in the Yorkshire Post and online. The online version included a link to the project website. The event took place on Saturday 8th February 2014 in the Atrium of Bridgewater Place between 10.00am and 5.30pm.

6.4 Representatives were present from the applicant's property and planning teams: architects Chetwoods, engineers Buro Happold, agents Jones Lang LaSalle and public relations and community consultation specialists Local Dialogue. Members of the public were encouraged to view the plans on display, ask questions and leave feedback.

6.5 Approximately 100 people attended the event. A total of 115 representations were made during the exhibition and afterwards, via post and online. Of these, 79 (69%) indicated full support for the plans, 13 (11%) indicated opposition to the plans and 23 (20%) were not sure or did not state a preference.

6.6 For those who were in favour of the plans, it was suggested that the proposed wind mitigation scheme is:

- Long overdue and needs to be brought forward as quickly as possible
- A vital measure which would be integral to the safety of those living and working in and around the building
- An accident prevention method
- A measure to prevent the roads being closed and prevent disruption for drivers at a particularly busy junction and access to Leeds city centre
- Something which will save taxpayers money in the long run
- Aesthetically appealing

6.7 People who opposed the scheme commented on:

- The appearance of the baffles
- The scheme looking 'too heavy'
- Whether the scheme will work because it is the first of its kind
- If more should be done at the southern end of the building

6.8 Of those who were unsure about the scheme, none said that they disagreed with the principle of wind mitigation surrounding Bridgewater Place but would prefer to adjust particular elements. Comments and suggestions from respondents who were unsure about the proposals were:

- The baffles should not be grey in colour
- Queried whether there would be more noise
- Queried whether the proposals would address the 'wind tunnel' for pedestrians near Back Row
- Unsure about whether the roads will still have to be closed
- Unsure about the footpath and whether the area would still be open to pedestrians and cyclists
- Suggested that the wind should be harnessed to save energy

6.9 No other comments have been received from any other party.

7.0 CONSULTATION RESPONSES:

7.1 <u>Statutory:</u>

Highways Services: The structures will need to be constructed by means of a S278 agreement (under the Highways Act) and payments for maintenance and ongoing liability for the baffles will be covered by this agreement. Part of the glass canopy proposed to be erected to the north of the building is shown to be over-sailing the adopted highway and a highway licence will need to be agreed with LCC. The mitigation scheme represents a significant improvement in wind conditions within the highway on days of high wind, albeit a residual number of fail points have been identified. In principle the Local Highways Authority would support the introduction of this scheme subject to detailed design, the necessary agreements and permissions and confirmation about the ongoing maintenance of the structures within and over the highway. Any residual high wind issues caused by the building would be monitored and addressed as part of the S278 agreement / building management.

Environment Agency: No objection

Yorkshire Water: No objection. It is essential that the presence of existing infrastructure is taken into account in the design of the scheme. The developer is aware of the existing infrastructure. In this instance, the developer is required to enter into 'a formal build-over agreement' prior to any works starting out on site. The developer should contact Yorkshire Water directly regarding the exact position of the baffles and proposed protection of the public sewer from the structures i.e. loading.

7.2 **Non-Statutory**

Contaminated Land: No objection subject to conditions

Environmental Protection: The design is to incorporate a perforated surface that air will flow over, which in certain circumstances can result in the production of noise. However, this type of phenomena is rare, would mainly occur at high wind speeds which also result in high background noise levels that would help mask any noise, and the structure appears to be very solid in nature. Therefore, the Environmental Protection Team has no adverse comments with regard to this application.

Flood Risk Management: No objection but advise discussion with Yorkshire Water due to the presence of a large 3.4m x 6.6m water sewer in the location of Baffle 3.

L.C.C. Wind Consultant - Rowan Williams Davies & Irwin Inc. (RWDI)
Consulting Engineers & Scientists: Provided the following in their submitted peer review

Introduction
The CPP (wind) report is the culmination of a programme of assessment that has involved wind tunnel testing and numerical analysis (computer modelling) to arrive at a solution that reduces wind speeds and is also compatible with other design constraints related to the site and services running past/through the site. The report submitted by the Applicant presents the results for two scenarios:

- the existing wind environment and
- Option 6C, which is the recommended mitigation solution.

Background

The wind tunnel tests were conducted and the report written by CPP (Cermak, Peterka, Petersen), who are based in Colorado, USA. CPP has an international profile in wind engineering with clients and projects across the globe. In this respect they are considered a highly competent provider of specialist wind engineering advice including detailed modelling such as wind tunnel testing.

Overview

The CPP report is considered a comprehensive document in that it addresses the following items:

- Pedestrian comfort
- Strong winds and their effect on pedestrians
- Strong winds and their effect on vehicles
- The wind environment at Bridgewater Place in comparison with the background wind
- climate
- Control measures in the event of strong winds
- Comparisons of control measures with other parts of the UK (Forth Road Bridge)

The results are presented in a wider context, as appropriate, but provide a direct 'before-and-after' comparison to quantify the effect of the proposed wind mitigation strategy.

The assessment is based upon the results of wind tunnel tests on a 1:300-scale model of the proposed development and surrounding buildings. The mean and gust (equivalent mean) wind speeds are measured at pedestrian level and these results combined with the long-term wind climate data which is then benchmarked against the Lawson Criteria for assessing Pedestrian Comfort as well as Strong Winds (or Pedestrian Distress). The following bullet points are directly extracted from the Executive Summary of the CPP report:

'*… This report presents the results of a mitigation solution, Configuration 6C, … effective in mitigating pedestrian wind speeds as far as practically possible within the confines and restrictions of the site…*';

'*… In the plaza to the north of the site … wind conditions are improved by Option 6C to a condition where all points pass the distress criterion on an annual basis and there are only three very marginal failures during the windiest winter months…*';

'*… some locations … currently … exceed the pedestrian distress criterion by over 20 hours per winter season …(this) exceedance … has been reduced to less than 3 hours per season with the … majority of locations being less than one hour per season…*';

'*…Implementation of Option 6C will … reduce the carriageway, and pedestrian, wind speeds around Bridgewater Place to less than those that will be measured in open country around Leeds … during the same wind storms for the critical southwest and westerly wind directions*';

'*… A local wind speed criterion of 45mph has been implemented by Leeds City Council above which traffic closures are implemented … Currently at the junction of Water Lane and Victoria Road this criterion could be expected to be exceeded around 236 hours per year on average. Following implementation of Option 6C, this could be expected to drop to around 28 hours per year…*';

'*…Wind speeds on the carriageways and footpaths around the site following construction of Option 6C will … be comparable … or less windy than, conditions… experienced in open countryside around Leeds…*';

'*…Option 6C … is the mitigation scheme that has proven most effective while remaining feasible within the constraints of the site and surrounding carriageways, and implementation … is recommended to … reduce future risk for road users and pedestrians*'.

The points above are corroborated by the results in the main report written by CPP.

Conclusion

The CPP report is both concise and extensive in its coverage of the wind microclimate issues at Bridgewater Place. The modelling process appears to corroborate with the wind environment experienced at the existing site and goes on to explain the implications of that wind environment in terms of effects on pedestrians and traffic.

Direct comparisons are drawn between the existing 'AC' configuration and the proposed '6C' mitigation option. The report is careful to point out that the development of '6C' has taken into consideration a number of site constraints over and above the wind microclimate.

Option 6C creates shelter over a relatively wide area at the north end of Bridgewater Place with wind conditions becoming suitable for more sedentary pedestrian activity (in terms of comfort), occasional breaches of the 15m/s 'distress' wind speed at a relatively small number of measurement locations, calming of the wind environment related to traffic in the vicinity of the Water Lane/Victoria Road junction and the expectation that there would be fewer occurrences where traffic control measures would be required.

Whilst RWDI have not been privy to the detailed calculations conducted by CPP, the report and processes described are in line with their experience of wind tunnel testing and the description of the results and the main conclusions were considered to be reasonable and were corroborated by the results.

8.0 PLANNING POLICIES:

8.1 The Development Plan

Section 38(6) of the Planning and Compulsory Purchase Act 2004 requires the application to be determined in accordance with the development plan unless material considerations indicate otherwise. The development plan is the adopted Leeds Unitary Development Plan (Review 2006) (UDPR), the Natural Resources and Waste DPD, the draft Core Strategy and Saved Policies. These development plan policies are supported by supplementary planning guidance and documents. The introduction of the NPPF has not changed the legal requirement that applications for planning permission must be determined in accordance with the development plan unless material considerations indicate otherwise. The policy guidance in Annex 1 to the NPPF is that due weight should be given to relevant policies in existing plans according to their degree of consistency with the NPPF. The closer the policies in the plan to the policies in the Framework, the greater the weight they may be given.

8.2 National Planning Policy Framework (NPPF)

Planning should proactively support sustainable economic development and seek to secure high quality design. It encourages the effective use of land and achieves standards of amenity for all existing and future occupiers of land and buildings.

Planning should seek to secure high quality design and a good standard of amenity for all existing and future occupants of land and buildings (para. 17). Local Planning Authorities should recognise town centres as the heart of their communities and support their vitality and viability; Design requirements are set out in section 7 noting that developments should establish a strong sense of place creating attractive and comfortable places to live, work and visit (para. 58).

8.3 Unitary Development Plan Review (UDPR)

The site is located in a designated Prestige Development Area which has been identified to accommodate large scale city centre related uses and to provide opportunity for achieving buildings which, due to their relative height and design excellence, would act as landmarks, signaling a prestigious entry into the city centre.

8.4 Other relevant UDPR policies include:

GP5 (detailed planning considerations to be resolved)
BD5 (ensure a satisfactory level of amenity for occupants and surroundings)
N12, N13, CC3 and BD6 (priorities for good quality urban design)
T2 (development should not create or materially add to problems of safety or efficiency on the highway network)
A4 (design of safe and secure environments, including access arrangements, public space, servicing and maintenance, materials and lighting).
T5 and T6 require satisfactory provision for disabled people, pedestrians and cyclists.

8.5 Draft Core Strategy (DCS)

The draft Core Strategy sets out strategic level policies and vision to guide the delivery of development investment decisions and the overall future of the district. The Submission Draft Core Strategy was examined by an Inspector in October 2013 and May 2014. The Inspector has approved two sets of Main Modifications to the Core Strategy. Following the recent receipt of the Inspectors report the Core Strategy is considered sound with agreed modifications and the Strategy is expected to be adopted by the Council on 12th November 2014. The Plan is therefore at a very advanced stage and significant weight can be attached to its policies.

8.6 Policy T2 identifies satisfactory accessibility requirements. Policy P10 requires new development to be based on a thorough contextual analysis to provide good design appropriate to its scale and function, delivering high quality innovative design and enhancing existing landscapes and spaces, and requires that development protects and enhances the district's historic assets in particular existing natural site features, historically and locally important buildings, skylines and views. Conservation Policy P11 states that innovative and sustainable construction, which integrates with and enhances the historic environment, will be encouraged.

8.7 Natural Resources and Waste Local Plan 2013 (NRWLP)

The Natural Resources and Waste Local Plan was adopted by Leeds City Council on 16th January 2013. Policy Water 4 requires developments in flood risk areas to consider the effect of the proposed development on flood risk, both on-site and off-site including the submission of a flood risk assessment (Water 6).

8.8 Supplementary Guidance

Tall Buildings Design Guide Spring 2010 requires that the design of tall buildings create active ground level frontages to adjacent streets and should provide high quality public realm, user friendly and legible entrances, good street level architecture and a good microclimate and comfort zone with counteraction to downdraughts.

8.9 This document states in Chapter 5 the studies that need to be carried out where tall buildings are proposed and states:

> *"It is essential that those involved with proposed tall buildings should conduct appropriate risk assessments and wind quantitative analysis (appropriate wind tunnel and/or CFD modelling) – especially the effects of down draughts and wind at the base of tall buildings or group of tall buildings. Assessments will also be required for areas beyond red line boundaries so that the developers and designers can demonstrate that their designs and measures will not produce harmful effects on pedestrians, vehicles and cyclists next to and away from the proposed tall building. In addition to standard assessments of likely comfort levels for persons sitting or walking in the vicinity of new tall buildings, it is important that extreme turbulence of high wind events can be modelled to assess the likely impacts on users at ground level, including high sided vehicles..."*
>
> *"..... The study also needs to demonstrate that appropriate mitigation measures have been applied to improve conditions in areas where the comfort and/or safety criteria have not been met....."*

The inclusion of mitigation measures is also mentioned in this chapter:

8.10 City Centre Urban Design Strategy September 2000 seeks to reinforce the positive qualities of character areas, re-establish urban grain, provide enclosure to streets, create visual interest, encourage excellent design, improve pedestrian connections, and promote active frontages.

8.11 Leeds Waterfront Strategy 2002 (Review 2006) guides the regeneration of Leeds Waterfront through uses, links and appropriate environmental enhancement.

9.0 MAIN ISSUES

1. Wind
2. Design and Impact on the Character of the Conservation Area
3. Highways
4. Other Matters

10.0 APPRAISAL

10.1 <u>Wind</u>

10.2 Pedestrian safety conditions around Bridgewater Place are clearly unacceptable at present during the periods of highest wind, as evidenced by site experience. This adversely disrupts traffic flow and impacts on local businesses, requiring specific measures to be undertaken including the closure of the local highway network. These existing conditions have been confirmed by the wind tunnel testing presented in the submitted wind report. A large number of mitigation options were tested but configuration 6C, the details of which are set out in para's 2.2.1 to 2.2.4 above, was

found to be the most effective in mitigating the local ground-level wind speeds as far as practically possible within the confines and restrictions of the site.

10.3 The report indicates that conditions with the mitigation measures of Option 6C are a significant improvement on the existing conditions, with the vast majority of test points now passing the distress criterion. Under Option 6C, all test points pass the distress criterion on an annual basis and as set out in the wind report by the applicant's consultant (CPP) 'will reduce the carriageway and pedestrian wind speeds around Bridgewater Place to less than those that will be measured in open country around Leeds….during the same wind storms for the critical southwest and westerly wind directions'.

10.4 Currently at the junction of Water Lane and Victoria Road, the 45 mph wind speed could be expected to be exceeded around 236 hours per year on average. Following implementation of Option 6C, this could be expected to drop to around 28 hours per year. Whilst this is not reduced to '0 hours' this is clearly a significant improvement over existing conditions.

10.5 The submitted wind report by the applicant's consultant CPP has stated the following (officer comments are provided in bold print – also please refer to plans attached at the end of this report for the location of the points referred to in the following paragraphs):

> '*For traffic travelling north on Victoria Road, at the junction of Water Lane, where the local wind direction is perpendicular to the traffic flow, all points passed the distress criteria with the mitigation measures implemented in configuration 6C. This is a significant improvement on existing conditions where a large number of locations failed the distress criterion and indicates much safer traffic conditions.*
>
> *On Water Lane, where the local wind direction during the majority of strong wind events can be expected to be parallel to the traffic, all locations to the north of Bridgewater Place fail the distress criterion in the existing conditions during the winter months. With the construction of configuration 6C, the number of failures is reduced to three, all located away from pedestrian crossings. The conditions at the pedestrian crossings on the east end of Water Lane are improved by configuration 6C to both pass the distress criterion and be classified as comfortable for pedestrian walking.* **(N.B. only 2 points of failure are identified in the accompanying diagrams for the distress criteria – these are points 70 and 71 which fail by 1m/s and 0.5m/s respectively and which the report states are within the highway but parallel rather than perpendicular to the vehicle movement and located away from pedestrian crossings and/or footpaths)**
>
> *The wind conditions for pedestrians around the building will also improve markedly with the construction of Option 6C. In the plaza to the north of the building,* **(N.B. the report does not define the extent of 'the plaza', however, many of the testing points are within the public highway to the north of the building)** *where the majority of incidents involving pedestrians have occurred, and where the highest density of pedestrians can be expected, due to this being the main access to the tower, all locations pass the annual distress criterion with Option 6C. There are only three very marginal failures of the distress criterion (of 0.2 m/s or less in each case)* **(N.B. please see diagrams included at the end of this report to see the extent of the marginal failures at locations 7, 9 and 11)** *but only during winter months. The marginal failure is well within the margins of error and repeatability of wind*

tunnel testing, and hence these conditions could reasonably be considered as being acceptable with Option 6C. In the existing conditions, all of these locations fail the distress criterion during the winter months. During the winter, comfort conditions in this area are currently classified as 'uncomfortable' but following construction of Option 6C the worst comfort conditions will be 'business walking'.

There are two locations on the northwest that, even after the addition of Option 6C, still fail the distress criterion: location 62 and 90.

- *Location 62 is only a marginal failure* **(by 0.3 m/s)** *during the winter months and passes on an annual basis. This is at the pedestrian crossing at the entrance to the service yard of Bridgewater Place. The marginal failure is also within the margins of error and repeatability of wind tunnel testing. It would thus be reasonable to conclude that the conditions on this crossing will be acceptable for pedestrian use, given the expectations of users during particularly windy days.*

- *Location 90 is in the doorway through the vertical shelter screen (at the north-western corner of the building). This doorway was included in order to allow pedestrian access between the western and northern sides of the building. As expected, wind speeds through the doorway are significantly accelerated compared with surrounding areas as a result of the pressure differential across the screen* **(exceed distress criteria by 1.8 m/s)***. Moving the location of the doorway further to the south might reduce this effect slightly, by reducing the pressure differential. The building management may also wish to restrict the use of this doorway on windy days.*

At the southern end of the building, only Location 88 failed the distress criteria following construction of Option 6C **(by 1.4 m/s)***. This is right at the northwest corner of the Grove Inn, and these wind speeds can be expected to be very localised to this corner. The corner is not part of a significant pedestrian thoroughfare* **(there is a defined pedestrian route however this is across private land on the western side of Bridgewater Place)***. The beer garden to the west of the Grove Inn is in a much more sheltered area and will not experience these wind speeds.*

An alternative way of looking at the improvements is to examine the number of hours that the distress criterion wind speed would be exceeded during an average year, or season, before and after construction of Option 6C. In the existing conditions, during winter when the maximum number of exceedances occur, there are numerous locations that exceed this wind speed by more than 10 hours during the season, with some exceeding the criterion during 20 hours and more. The criterion for exceedance is approximately 0.9 hours. Following construction, there are only seven of the 69 locations tested (with the exception of Location 90 discussed above) that exceed the 0.9 hours threshold. Of these there are only two locations that exceed the wind speed for between two and three hours over the season. The other locations exceed the wind speed by less than an hour and a half each during the winter season.

With the mitigation measures implemented in Configuration 6C, the maximum annual estimated closure time of the road at the Neville Street/Water Lane Junction using the current criterion of 45 mph is about 28 hours. This compares

with an existing estimated average number of closure hours of around 236 hours per year.

Based on our (CPP) experience and review of literature, the 45 mph criterion is reasonable as a criterion for use in alerting or restricting access to high-sided and other wind-sensitive vehicles and road users, but may be considered conservative for less-wind sensitive vehicles. As a point of comparison, the Forth Road Bridge closes to double decker buses at gust wind speeds of 45 mph. At 50 mph, the bridge is closed to high-sided vehicles, bicycles, vehicles with trailers, and pedestrians. At 65 mph, the bridge remains open only to cars, with the bridge finally closed to all traffic when gust wind speeds of 80 mph are measured.

For comparison the wind speeds for each direction required to trigger traffic restrictions around Bridgewater Place have been back-calculated to the gust wind speeds that would be measured at Leeds Airport at the same time. In the current conditions, the wind speeds around Bridgewater Place are generally higher than those out at the airport for the critical southwest through westerly directions. This demonstrates the speed-up as a result of the building. The same calculation following construction of Option 6C shows that the wind speeds at the airport would be significantly higher than those around Bridgewater Place. This indicates two things: firstly that Option 6C is working effectively to mitigate wind speeds around the development; and secondly that the wind speeds experienced around Bridgewater Place following construction of Option 6C will on average be significantly lower than those that will be experienced by traffic in open country around Leeds at the same time.'

10.6 The impact of the proposal on the wind environment and contained in the submitted wind report has been verified by the peer review undertaken by L.C.C.'s retained Wind Engineers RWDI who concluded that:

The CPP report is both concise and extensive in its coverage of the wind microclimate issues at Bridgewater Place. The modelling process appears to corroborate with the wind environment experienced at the existing site and goes on to explain the implications of that wind environment in terms of effects on pedestrians and traffic. Direct comparisons are drawn between the existing 'AC' configuration and the proposed '6C' mitigation option. The report is careful to point out that the development of '6C' has taken into consideration a number of site constraints over and above the wind microclimate.

Option 6C creates shelter over a relatively wide area at the north end of Bridgewater Place with wind conditions becoming suitable for more sedentary pedestrian activity (in terms of comfort), occasional breaches of the 15m/s 'distress' wind speed at a relatively small number of measurement locations, calming of the wind environment related to traffic in the vicinity of the Water Lane/Victoria Road junction and the expectation that there would be fewer occurrences where traffic control measures would be required. Whilst RWDI have not been privy to the detailed calculations conducted by CPP, the report and processes described are in line with their experience of wind tunnel testing and the description of the results and the main conclusions were considered to be reasonable and were corroborated by the results.

10.7 The submitted wind report clearly shows that the baffles and screens will have a significant mitigating impact on the wind speeds and this will result in a much safer

pedestrian and vehicular environment. This has been verified by independent peer review. It is still the case that there will be more limited occasions when wind speeds exceed the pedestrian distress rating criteria and 45 mph at the junction of Water Lane and Victoria Rd. However, post implementation monitoring, as required by condition, will review the need for any further road closures or high sided vehicle diversions in line with a revised protocol and the need for the pedestrian shelter works on Victoria Rd. Therefore, it is considered that the Local Planning Authority can do no more than to rely on the report and studies submitted and verified and that it is reasonable to take the steps outlined in this report to provide the best possible wind mitigation scheme within the constraints, as they exist, on site.

10.8 Design and Impact on the Character of the Conservation Area

10.9 The site occupies a prominent location adjacent one of the main arterial routes of the city and contains Leeds' tallest building. The conservation area boundary is also located immediately to the north of the building and therefore the site is considered sensitive, even though it is occupied by a large modern building and a traffic junction. From the start of the process, there has been a desire to make these essentially functional structures look aesthetically pleasing and in character with their setting in the Canal Wharf Conservation Area. However, it is clear that, of greatest importance, is that the proposal should offer the most effective mitigation solution possible with any design considerations not compromising the structure's functionality.

10.10 As Bridgewater Place is 32 storeys high, the structures are seen in the context of the building and are much smaller in comparison. This allows the structures to be accommodated within their setting, rather than over-dominating it. The glass canopy around the base of the building, described in para 2.2.1 above, has been located at a point on the building where the glazed lower floors give way to the masonry upper floors. This gives the positioning of the canopy, in relation to the building, a degree of logic. The canopy also follows the radius of the main tower element which reinforces the curved form. As the canopy is of glass there is transparency which resonates with the large glazed atrium elevation, and the lower floors of the building, allowing the building to be seen through the canopy itself. The canopy has to be able to withstand considerable forces which results in the need for support columns and horizontal members of some robustness. The design and location of the canopy are considered to respond well to the design of the existing building and in this context the canopy and its support structure are considered to be appropriate to their setting at the base of a 32 storey modern glazed and masonry tower.

10.11 Whilst the vertical screens are tall functional structures, between 12m and 18m in height as described in para's 2.2.3 and 2.2.4 above, they are to the west of the building and are not as prominently located as the baffles. They provide a visual end stop to the radiused horizontal canopy so there is an architectural logic to their presence. Due to the surface material they are visually porous so there will be an element of transparency to them which will allow views through to the building beyond. They are tied together horizontally by the canopy which relates them to the horizontality of the window details in this part of the building but without being located directly in front of the windows thereby preserving the amenity of the occupiers to an acceptable level. It is considered that, in this context, adjacent a much taller building, the vertical screens and horizontal canopy are acceptable additions to the base of the building.

10.12 The proposed screen to the south side of the building will be located adjacent to, what appear to be, 5 no. residential windows above the Grove Inn public house (the site visit showed signs of residential activity on the terrace adjacent to the windows such

as a washing line and barbeque equipment). Although the screen would create further enclosure to the windows and terrace area, the screen would be sited at least 5.5m away from the windows and would only be located directly opposite two windows. One of these windows appears to be providing light to a hallway and the other window is to a kitchen area with the kitchen also having a second window on this elevation, as well as a window on the western elevation. In addition, the screen is necessary, at the dimensions and in the location shown, to mitigate against the potential wind impact on the public space immediately to the south of Bridgewater Place. In the context of the above and the fact that the adjacent 8 storey wing of the Bridgewater Place building is sited only 7.5m away from the windows, it is considered that, on balance, the proposed screen is acceptable in its impact within this dense urban context.

10.13 The free-standing baffles described in para 2.2.2 span the road and these will be clearly visible in the street scene. As much as possible an attempt has been made to make these sculptural forms rather than appearing as a series of highway gantries, but without compromising the effectiveness of the baffles themselves.

10.14 The baffles sizes and shapes have been critically measured and tested. Officers have been advised by the applicant that 'to extend their length and taper would have created unnecessary length and over-sailing issues. Tapering the baffles any more than they currently are would have impaired their performance. Each one adheres to an overriding geometric principle which sets out the extent of taper, the angle at which each is cut and its length, which is specific to its location'.

10.15 The tapering ends and internal support structure are considered to be a visually pleasing form. The fact that there is an element of transparency, due to the porosity of the surface material, means that they will not present a solid barrier to views. As they would be suspended over the carriageway, this means that there would be clear views beneath them. The architect has advised that the design of the support columns could be developed to take on a taper rather than a step, which would prevent them from gathering discarded litter. It is considered that the baffles would be seen as sculptural forms, rather than as functional highways equipment, and that this would be strengthened at night with the inclusion of a subtle lighting scheme. The baffles are therefore considered to be acceptable structures which have been well considered and would contribute to the character of the area rather than detract from it.

10.16 The package of mitigation measures would be seen as part of the modern series of buildings which spread out towards the south of the city, commencing immediately to the south of the Conservation Area. The proposed mitigation scheme would be seen in the context of the tower and would be very much subordinate to it. It would not appear as an unduly discordant or over-dominating feature in the street scene and is considered to preserve the character of the Conservation Area. However, it must be made clear that the functionality of the structures and the safety of highway users is the overriding factor in this application.

10.17 <u>Highways</u>

10.18 The flexible use of the highway has been required to enable the mitigation measures to be constructed and this demonstrates the commitment of L.C.C. to achieving the best possible solution. The impact of the scheme on the public highway has been developed with the project architects and engineers. It is considered that Option 6C represents the best solution to the question of how to accommodate the optimal location for the baffles whilst maintaining a safe and functioning highway. The comments of Highways Services above indicate that Local Highways Authority would support the introduction of this scheme subject to detailed design, the necessary

agreements and permissions and confirmation about the ongoing maintenance of the structures within and over the highway.

10.19 The pedestrian crossing has been straightened to respond to likely pedestrian desire lines and the cycle route through the site is maintained. In addition, street lighting, guard railing, crossing points and tactile paving areas have all been considered and can be successfully accommodated within the scheme. The full details and their delivery along with the maintenance of the structures will be controlled by a S278 Agreement under the Highways Act. It is considered that the successful implementation of the wind mitigation scheme would allow the existing protocol for road closures and the pedestrian shelter in the vicinity of the site to be revisited and amended to reduce the inconvenience to users of the site and surrounding area.

10.20 Other matters

10.21 The response to the additional points, not already addressed above, and raised by Leeds Civic Trust is as follows:

- Perforation detail: Detailed testing of perforation patterns will be carried out at a later stage and during the detail design stages. However the overriding requirement is that the material has a porosity of 50%. Panel sizes and fixing details will all be considered during the next stages of design.

- Use of colour: Colour is an option for the column supports which are painted. However, given the perforated nature of the screens and baffles they cannot be painted as this would lead to difficult maintenance issues later. As such the screen and baffles are a natural mill finish of marine grade aluminium – this material has been successfully used in harsh environments

- Lighting: The proposed lighting scheme for the Baffles is provided by LED lights embedded into acrylic strips – these have been chosen as they have an extremely long life span, with minimal maintenance required.

- Bird Roosting: It is possible to design structures to prevent roosting although it is difficult to prevent perching. All of the structures have been designed so that they discourage roosting, no flat surfaces etc. The environment directly behind the mesh screens would be potentially uncomfortable due to the wind speeds passing through the screen and the turbulence created directly behind the perforated material. Bird prevention measures will be considered throughout the detailed design process.

- Advertising: No advertising is proposed or intended. Any future proposals would require a separate application for approval.

10.22 As stated above, the issue of potential noise generation by the baffles has been considered with the features that lead to noise being understood. Aero-acoustic wind tunnel testing has been recommended to validate the final choice of material to reduce as much as possible the likelihood of wind related noise and this will be controlled by condition.

11.0 CONCLUSION

11.1 There is clearly a recognized wind problem in the vicinity of Bridgewater Place and a considerable amount of work has been undertaken to produce the most effective scheme possible, given the physical constraints of the site. Whilst the site is prominently located and partly within the Canal Wharf Conservation Area, it is clear that, of greatest importance, is that the proposal should offer the most effective mitigation solution possible, with design considerations not compromising the structure's functionality. In this overall context, it is considered that all the proposed elements work together visually and, in the setting of such a tall building, relate well to their immediate environment.

11.2 The submitted wind report clearly shows that the baffles and screens will have a significant mitigating impact on the wind speeds and this will result in a much safer pedestrian and vehicular environment. It is still the case that there will be certain times when wind speeds exceed the pedestrian distress rating criteria. However, post implementation monitoring, as required by condition, will review the need for any further road closures or high sided vehicle diversions in line with a revised protocol and the need for the pedestrian shelter that is being erected on Victoria Rd.

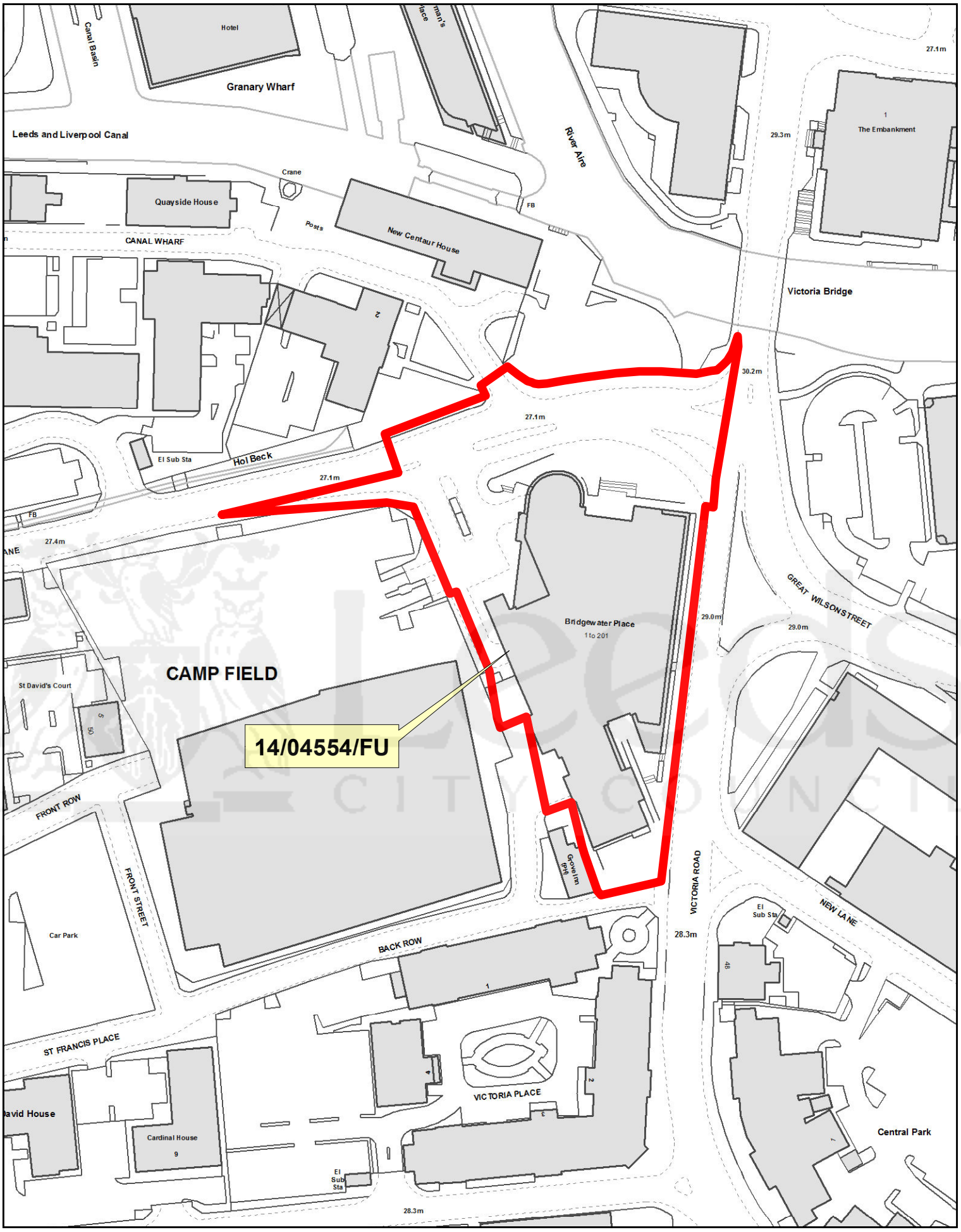
BACKGROUND PAPERS

Original Planning Permission granted 22nd November 2001 app. ref. 20/337/00/FU

Revised Planning Permission granted 26th February 2002 app. ref. 20/407/01/FU.

Further Revised Planning Permission granted 7th November 2003 app. ref. 20/313/03/FU

Further Revised Planning Permission granted 26th October 2004 app. ref. 20/339/04/FU



CITY PLANS PANEL

PRODUCED BY CITY DEVELOPMENT, GIS MAPPING & DATA TEAM, LEEDS CITY COUNCIL

SCALE : 1/1500

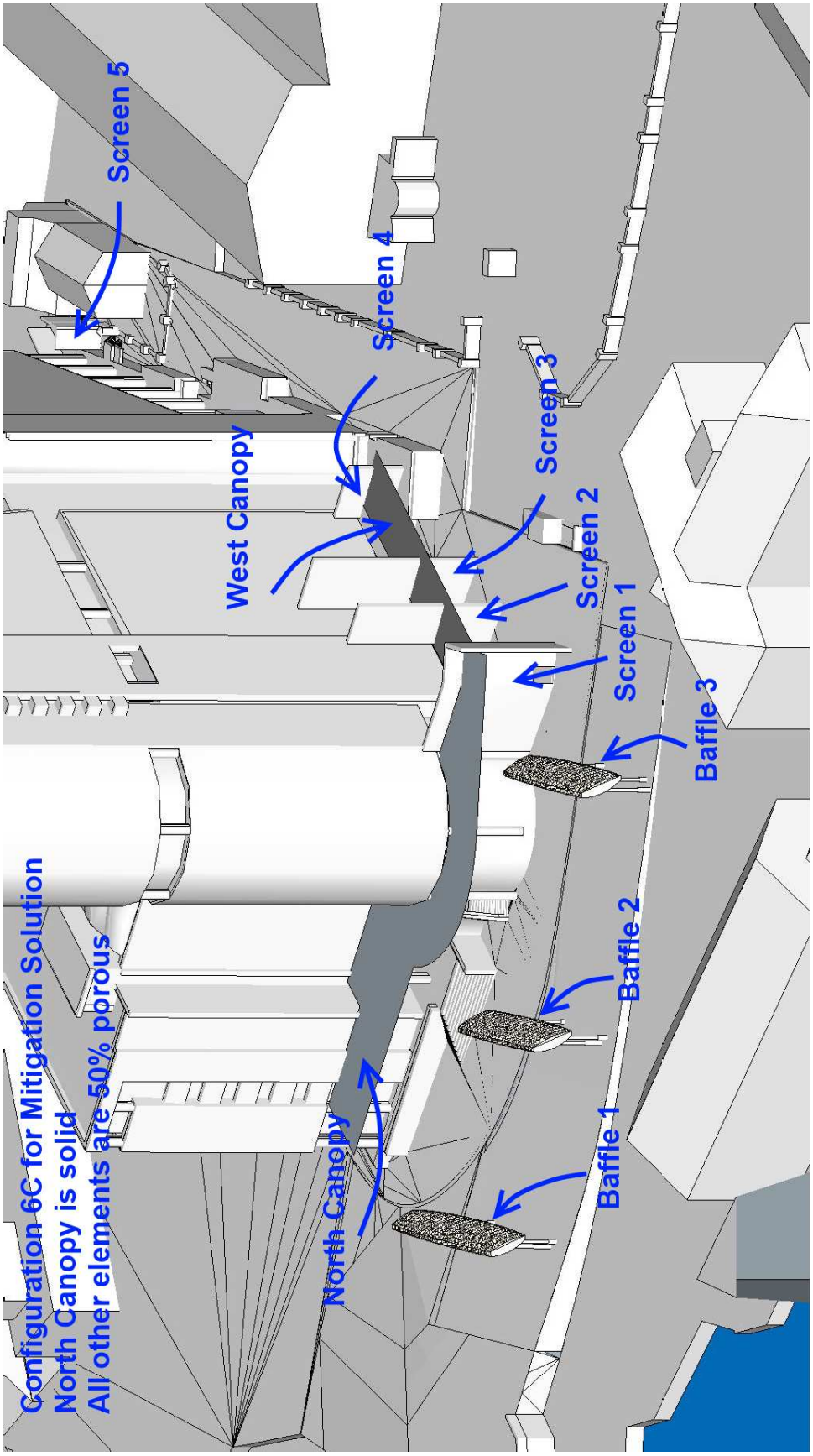


Figure 2. Configuration 6C setup for mitigation solution.

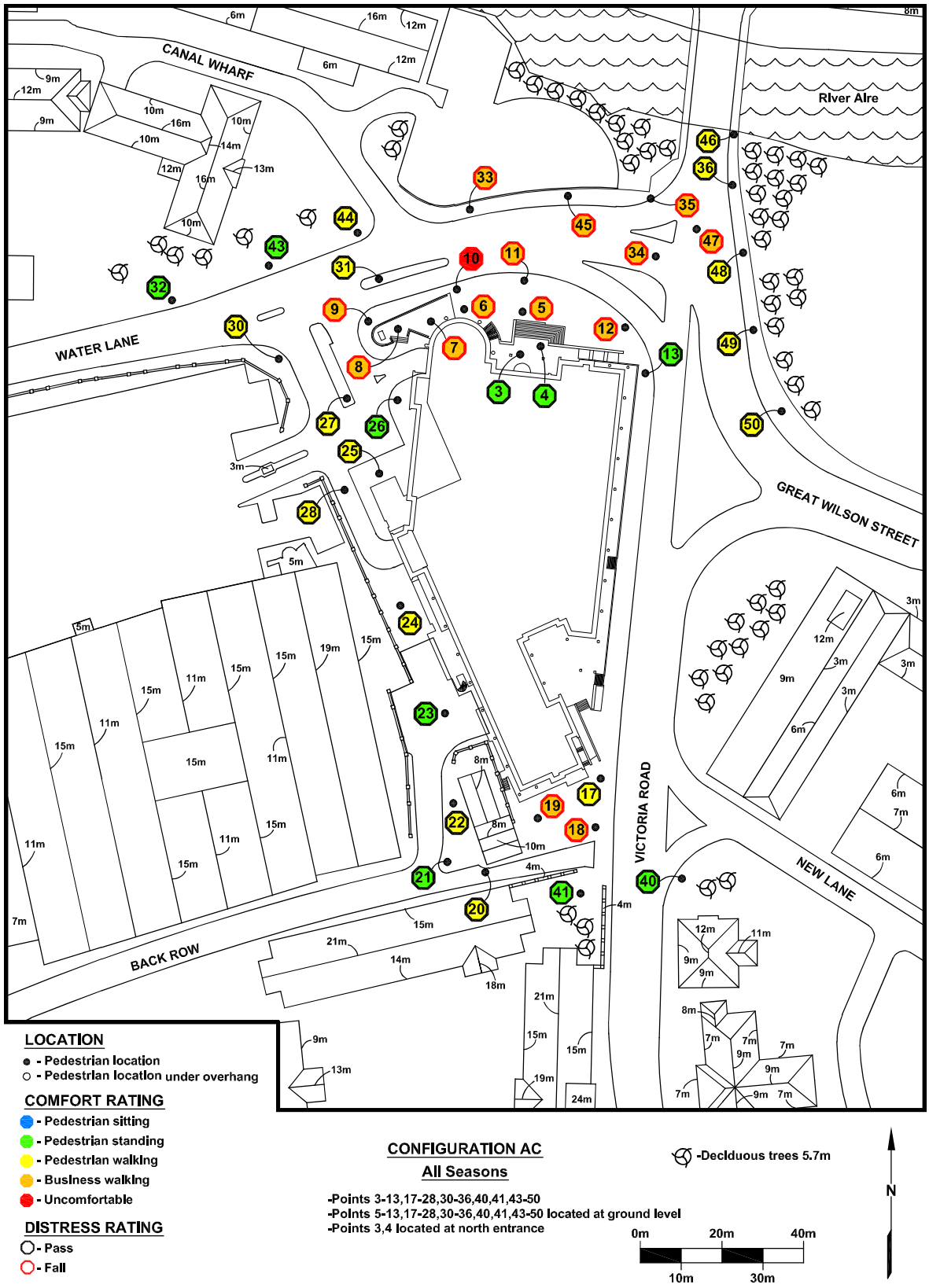


Figure 3a. Pedestrian wind comfort compared with Lawson criteria Configuration AC - existing site conditions, original points, annual.

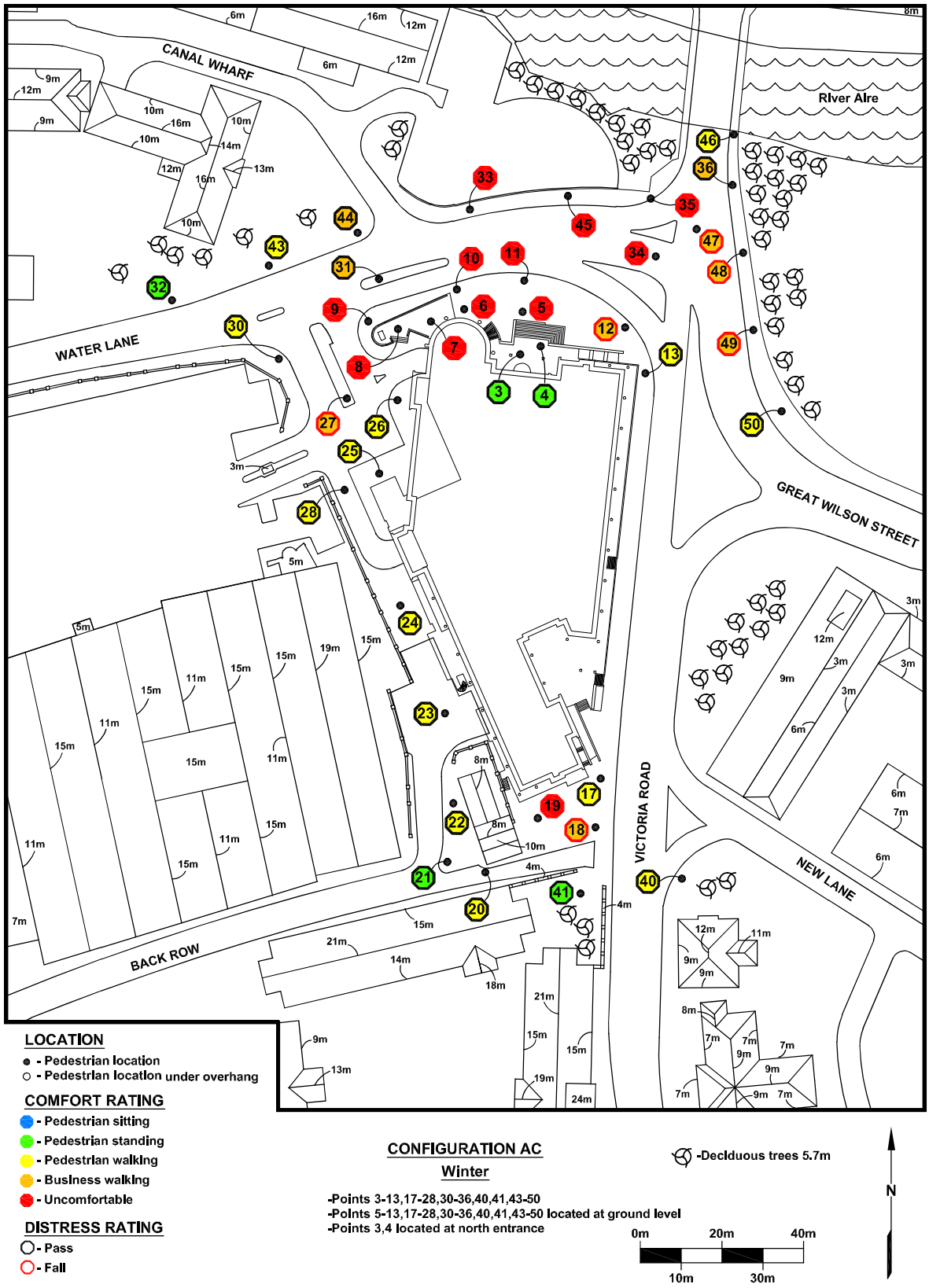


Figure 3b. Pedestrian wind comfort compared with Lawson criteria Configuration AC - existing site conditions, original points, winter.

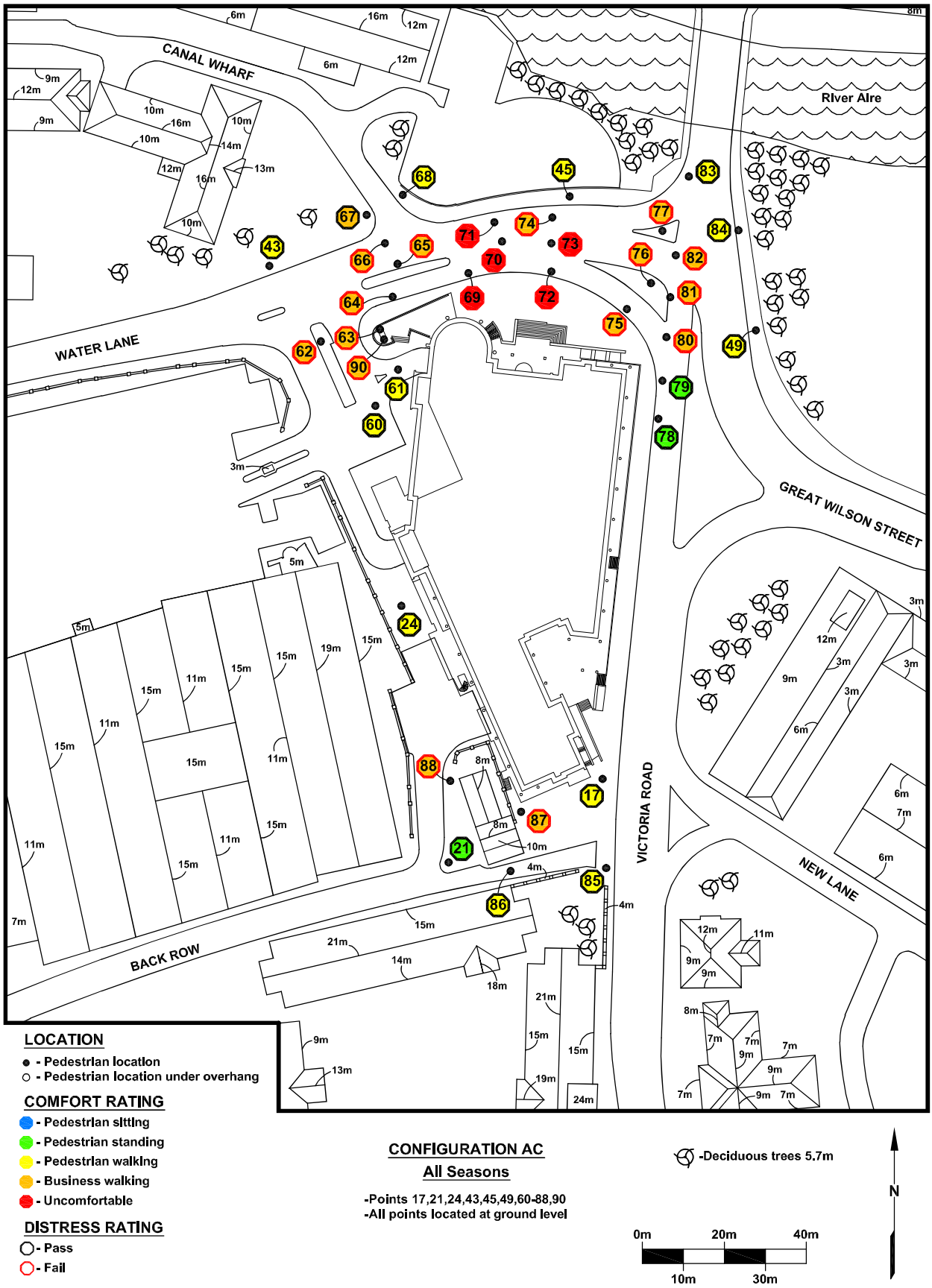


Figure 3c. Pedestrian wind comfort compared with Lawson criteria
Configuration AC - existing site conditions, additional and repeat points, annual.

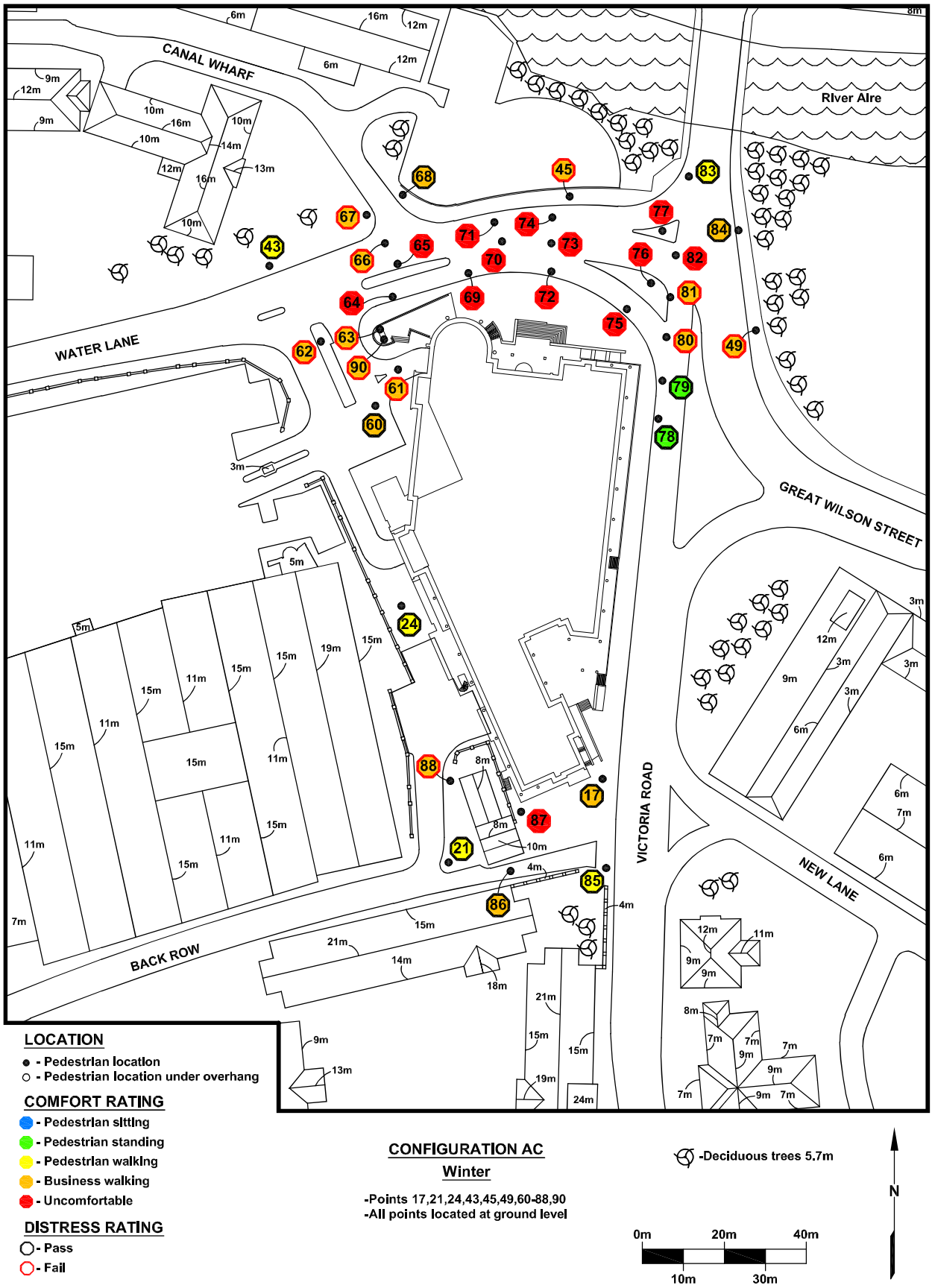


Figure 3d. Pedestrian wind comfort compared with Lawson criteria
Configuration AC - existing site conditions, additional and repeat points, winter.

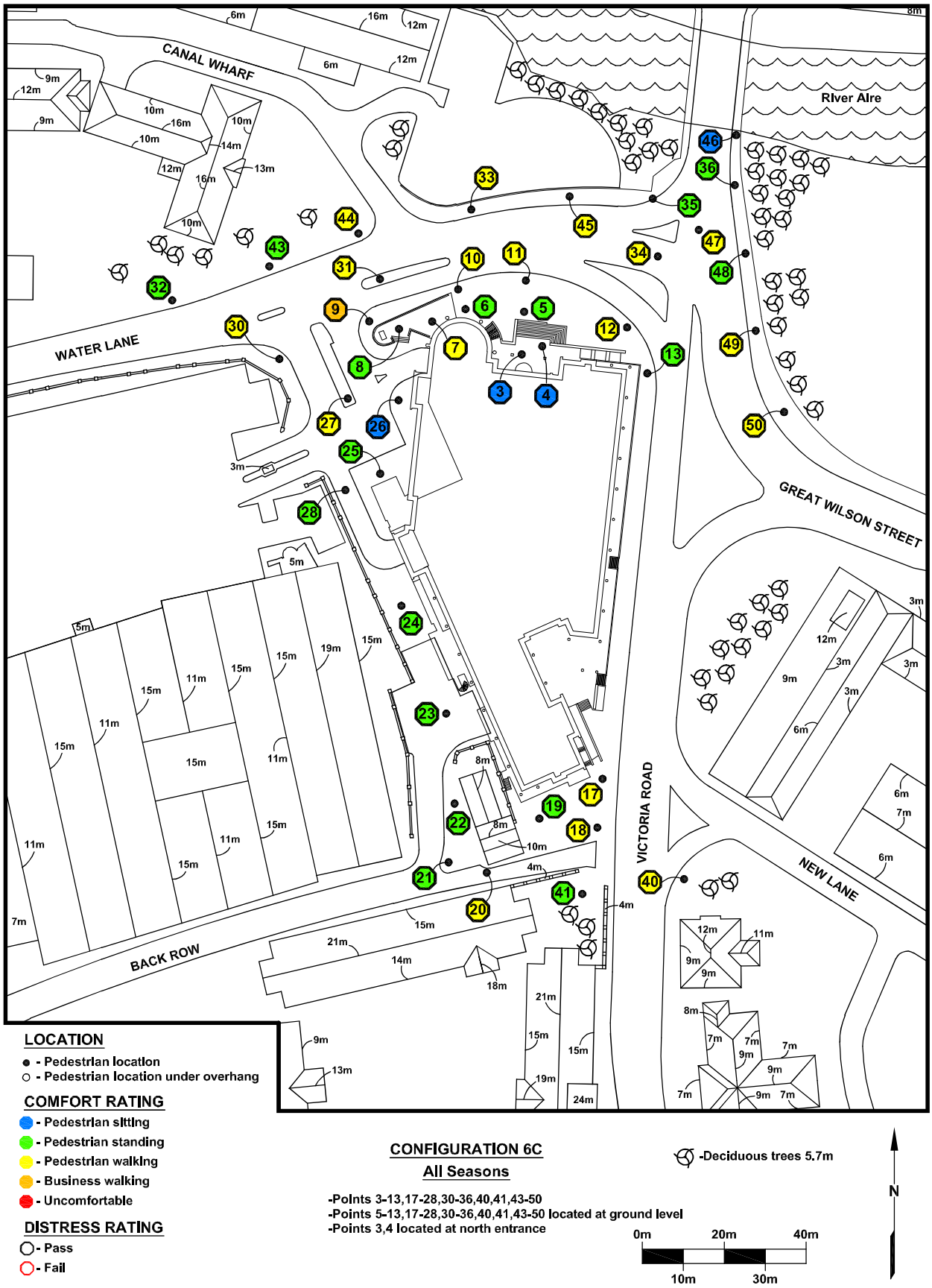


Figure 3e. Pedestrian wind comfort compared with Lawson criteria Configuration 6C, original points, annual.

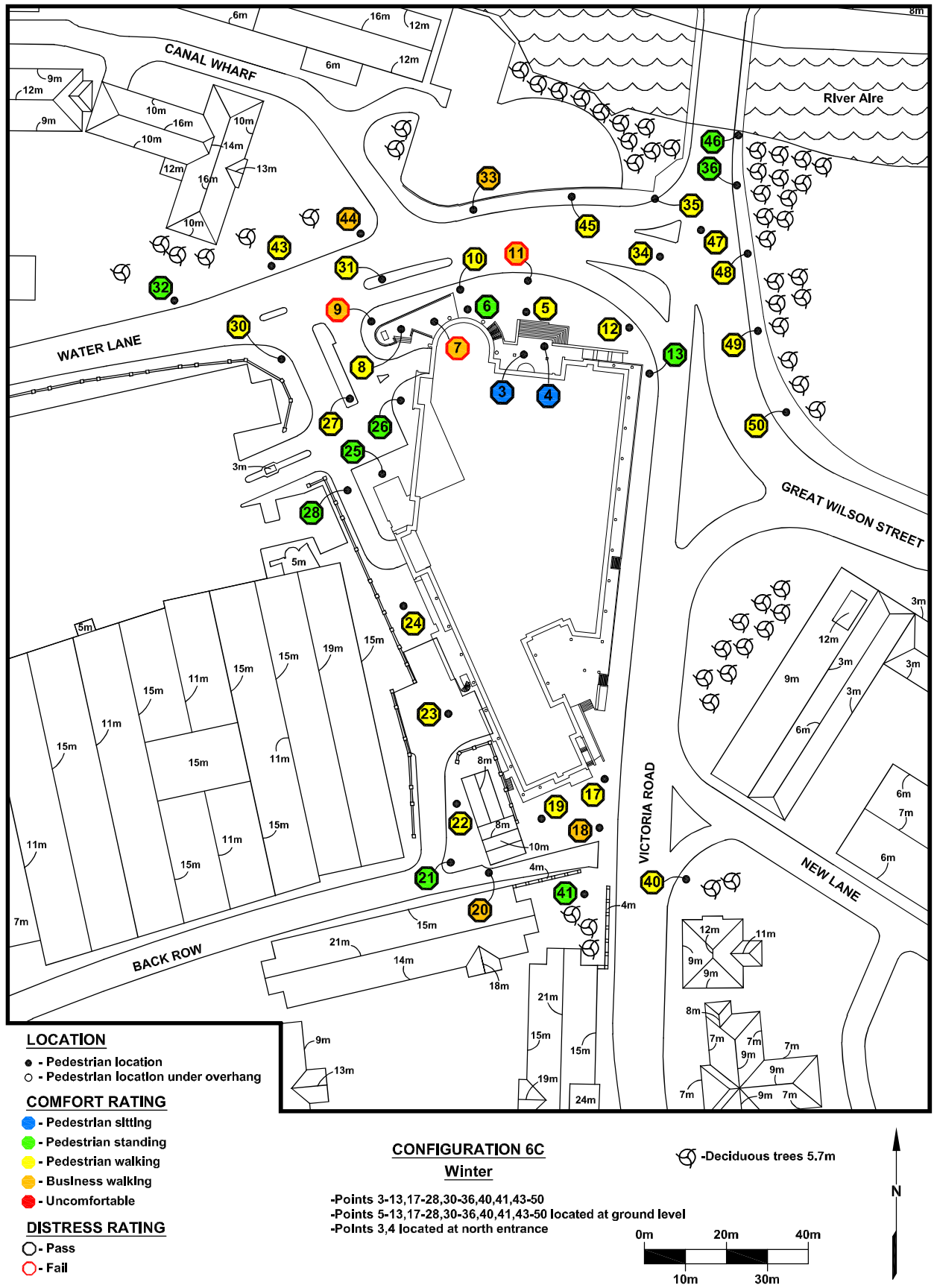


Figure 3f. Pedestrian wind comfort compared with Lawson criteria Configuration 6C, original points, winter.

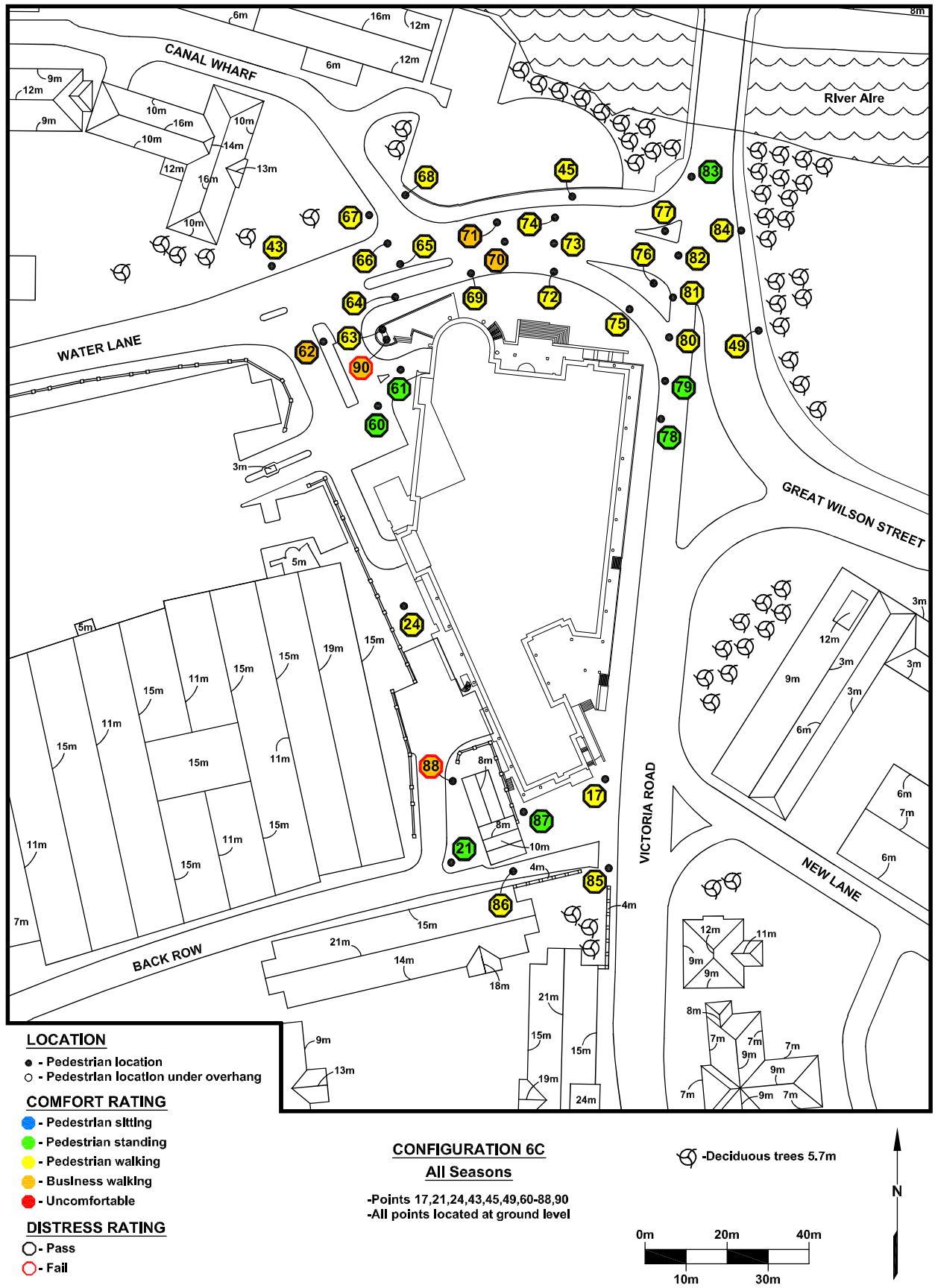


Figure 3g. Pedestrian wind comfort compared with Lawson criteria
Configuration 6C, additional and repeat points, annual.

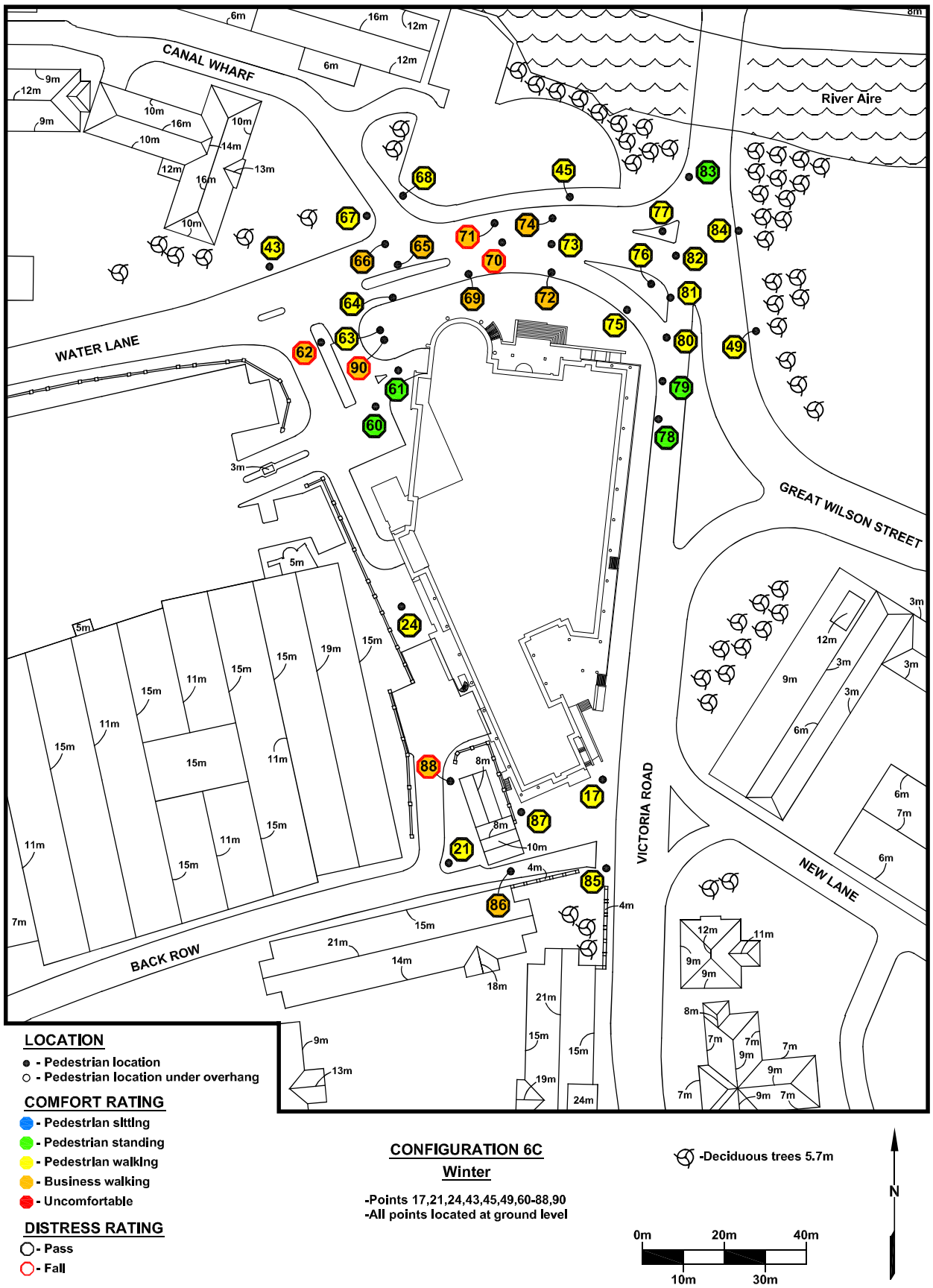


Figure 3h. Pedestrian wind comfort compared with Lawson criteria
Configuration 6C, additional and repeat points, winter.

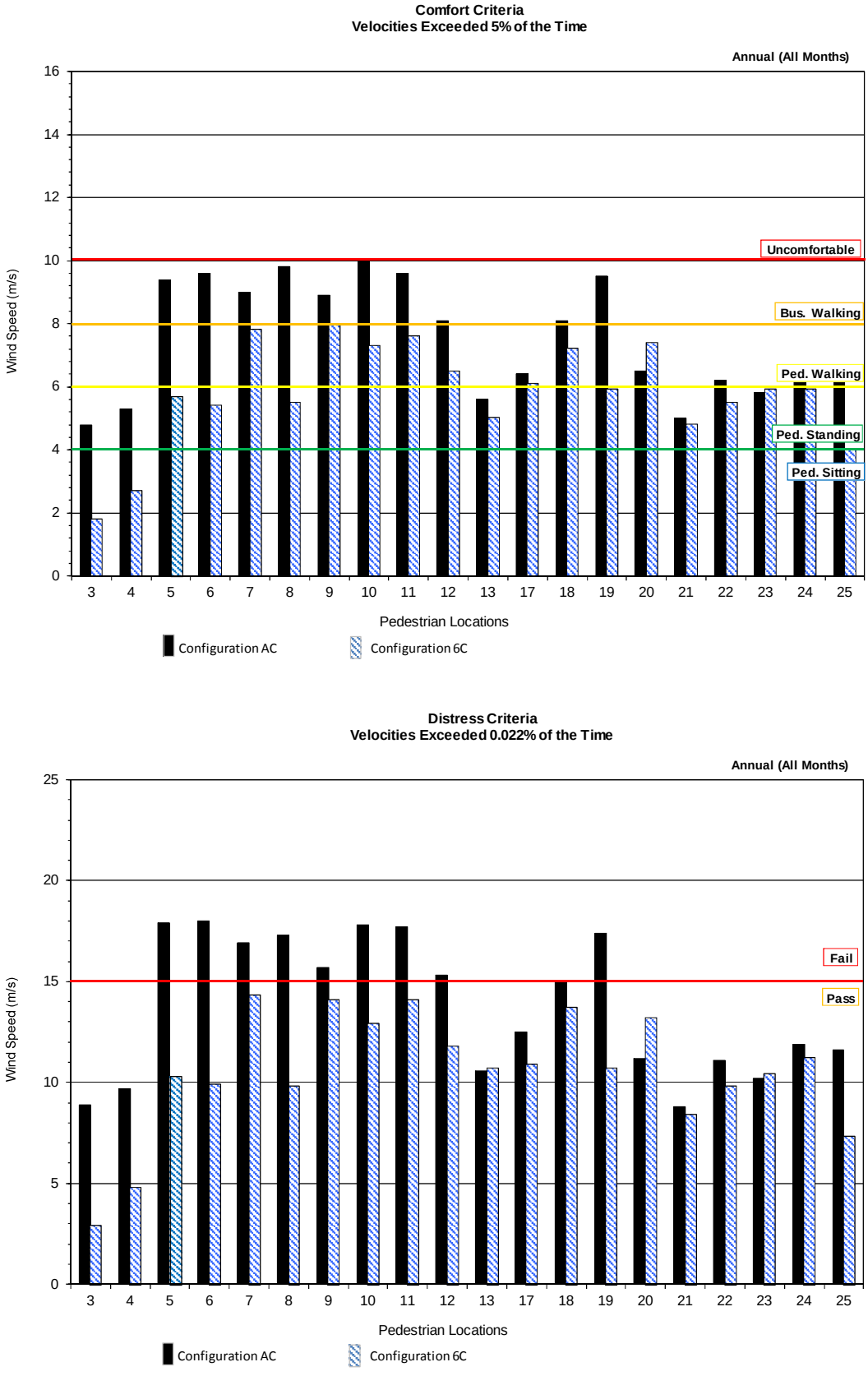


Figure 4a. Summary of pedestrian wind comfort/distress ratings, original points, annual.

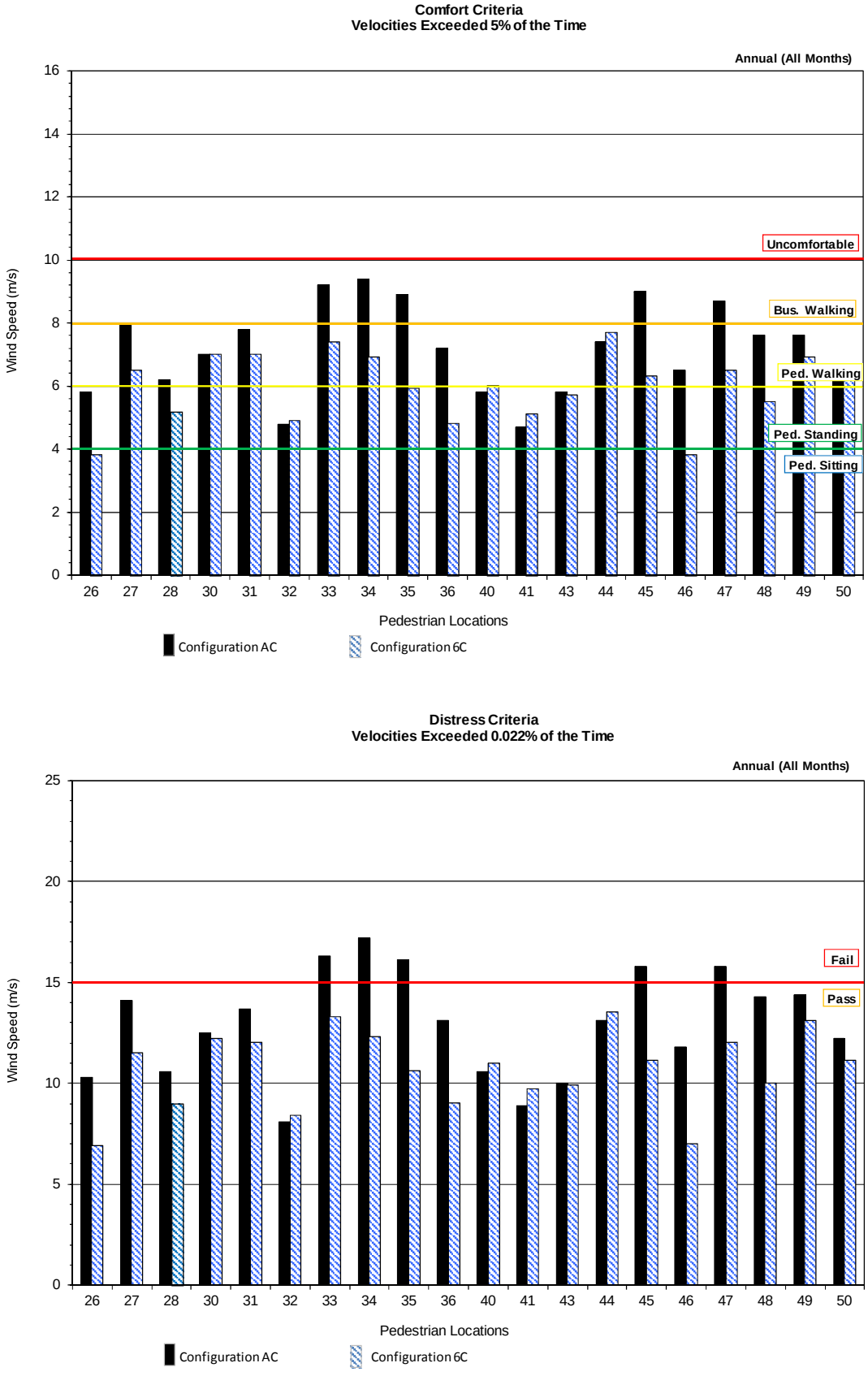


Figure 4b. Summary of pedestrian wind comfort/distress ratings, original points, annual.

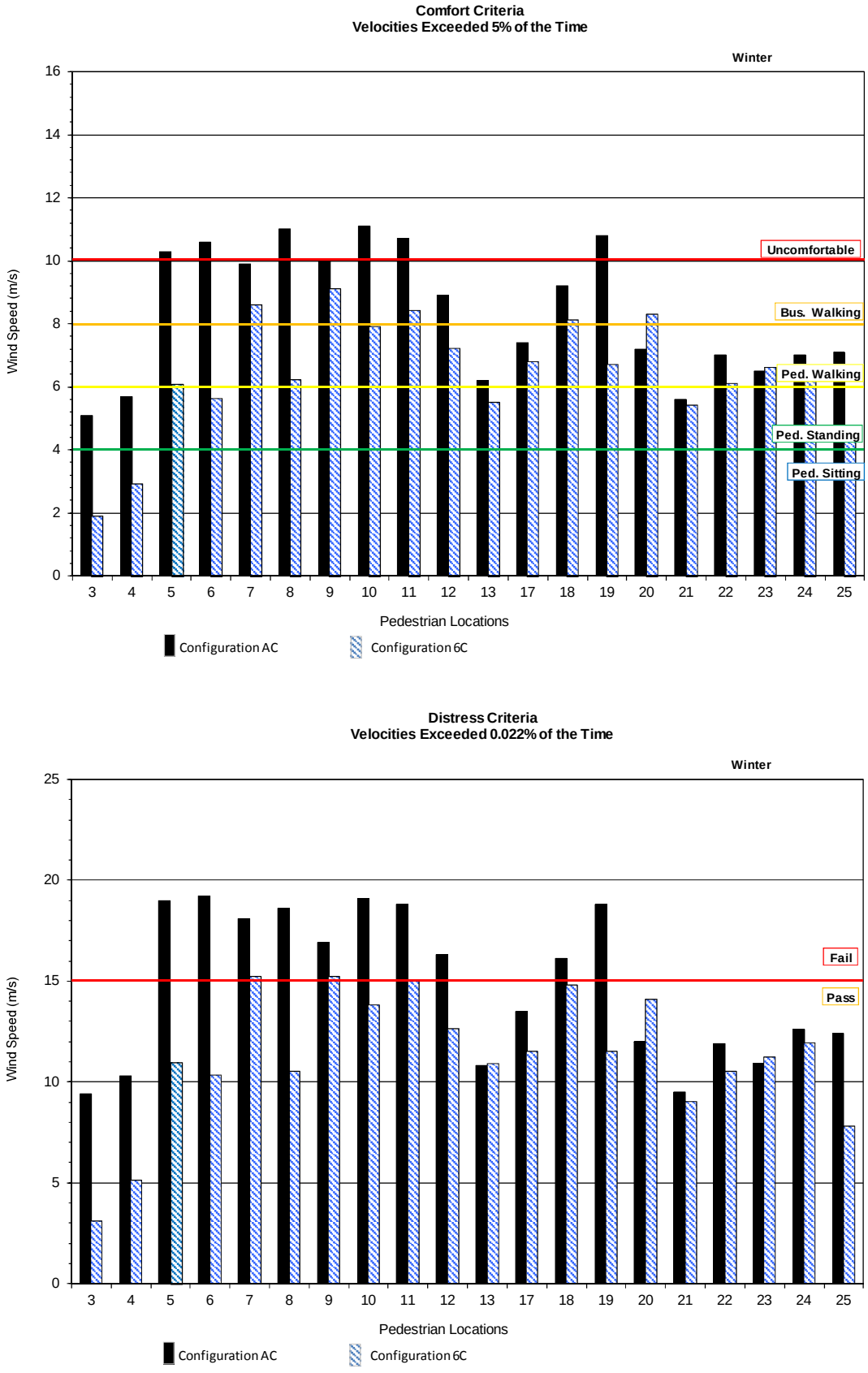


Figure 4c. Summary of pedestrian wind comfort/distress ratings, original points, winter.

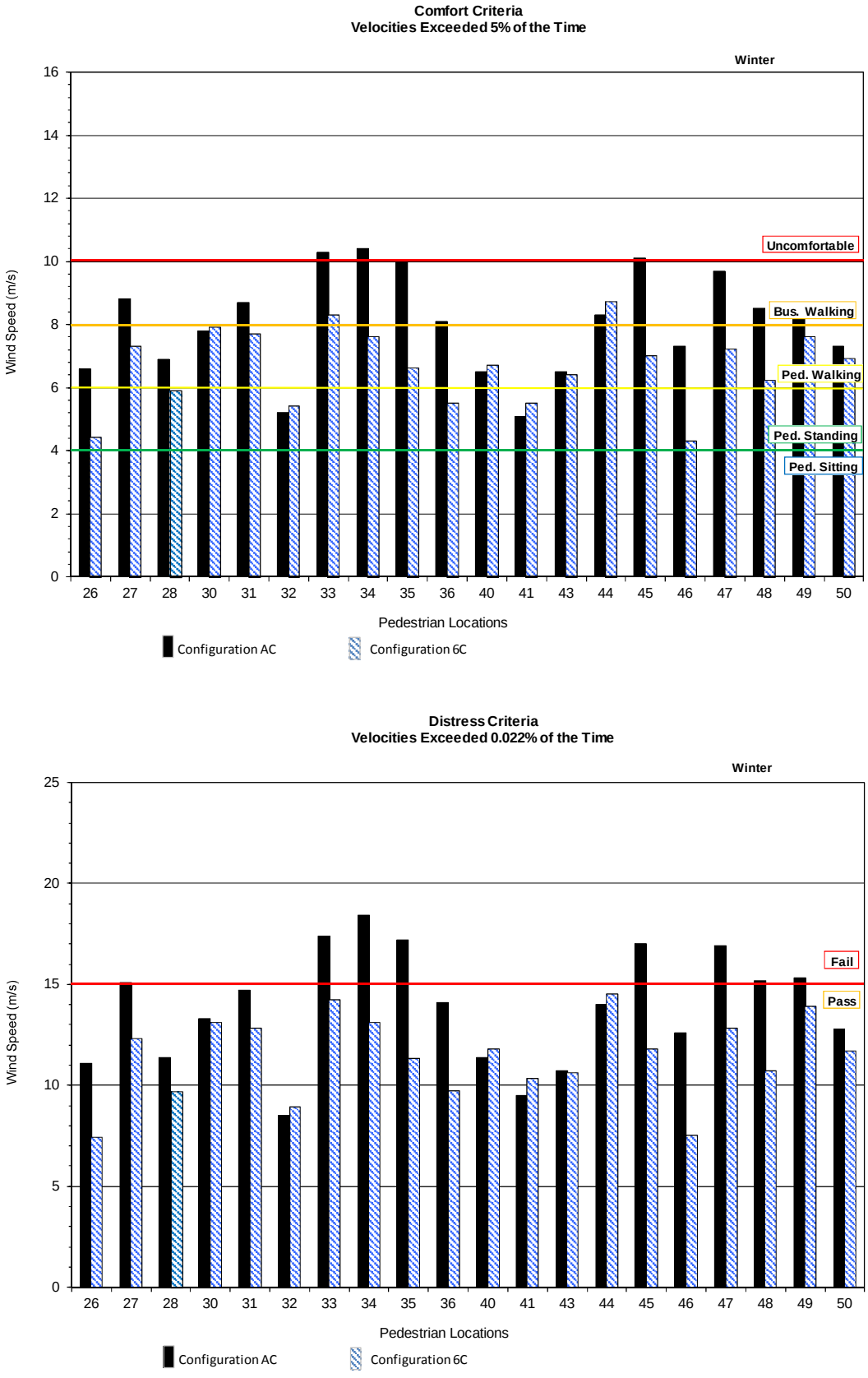


Figure 4d. Summary of pedestrian wind comfort/distress ratings, original points, winter.

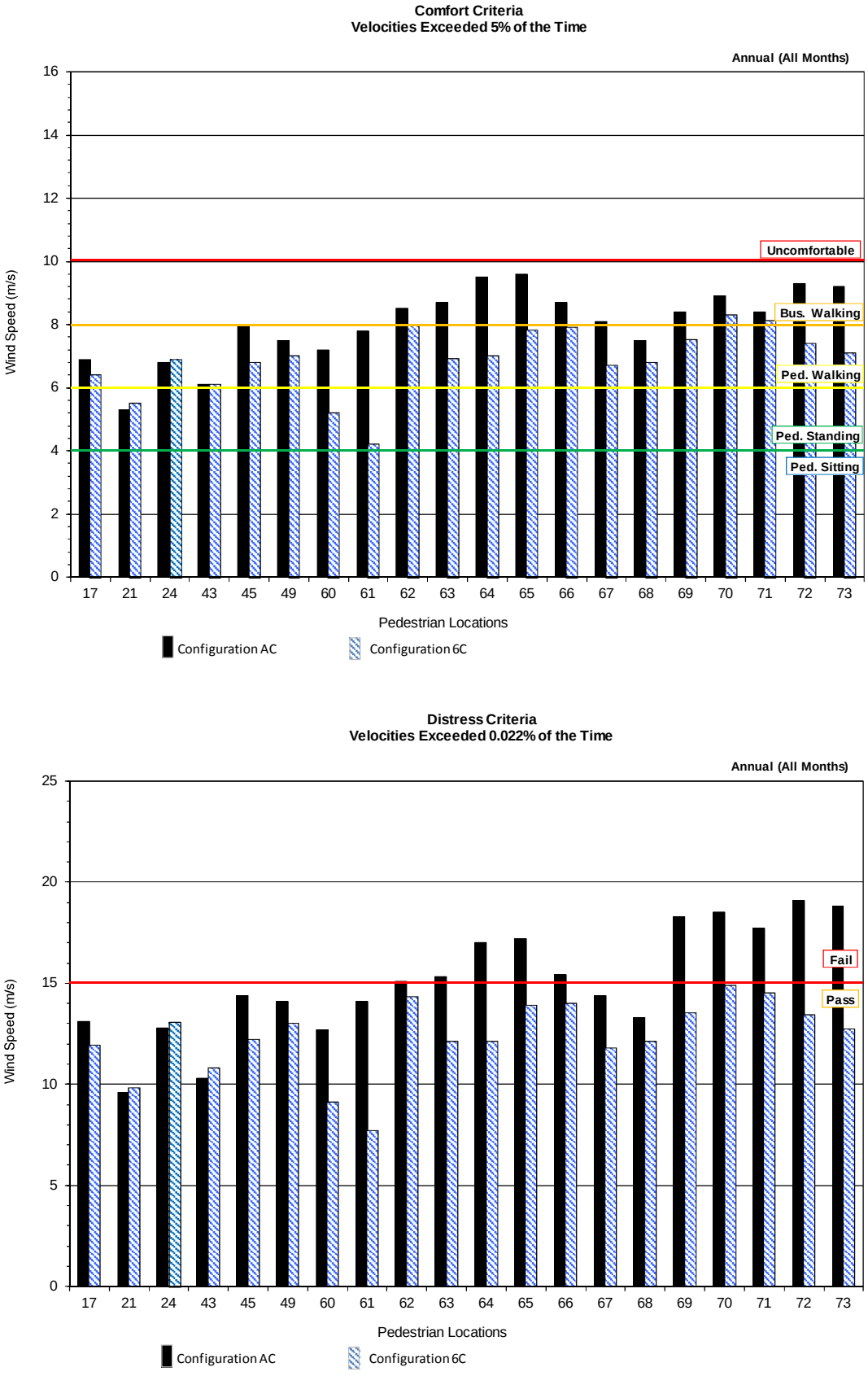


Figure 4e. Summary of pedestrian wind comfort/distress ratings, additional and repeat points, annual.

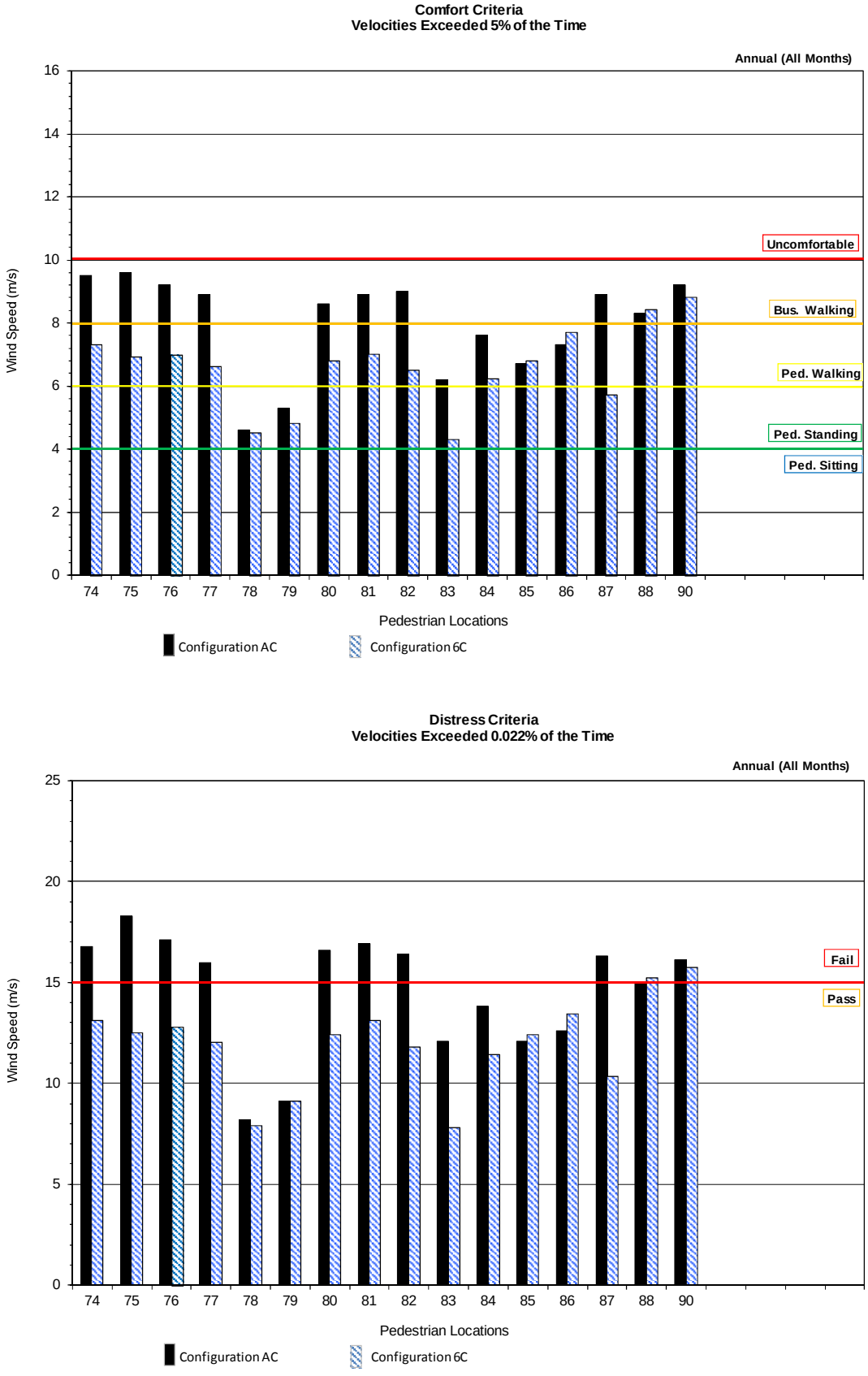


Figure 4f. Summary of pedestrian wind comfort/distress ratings, additional and repeat points, annual.

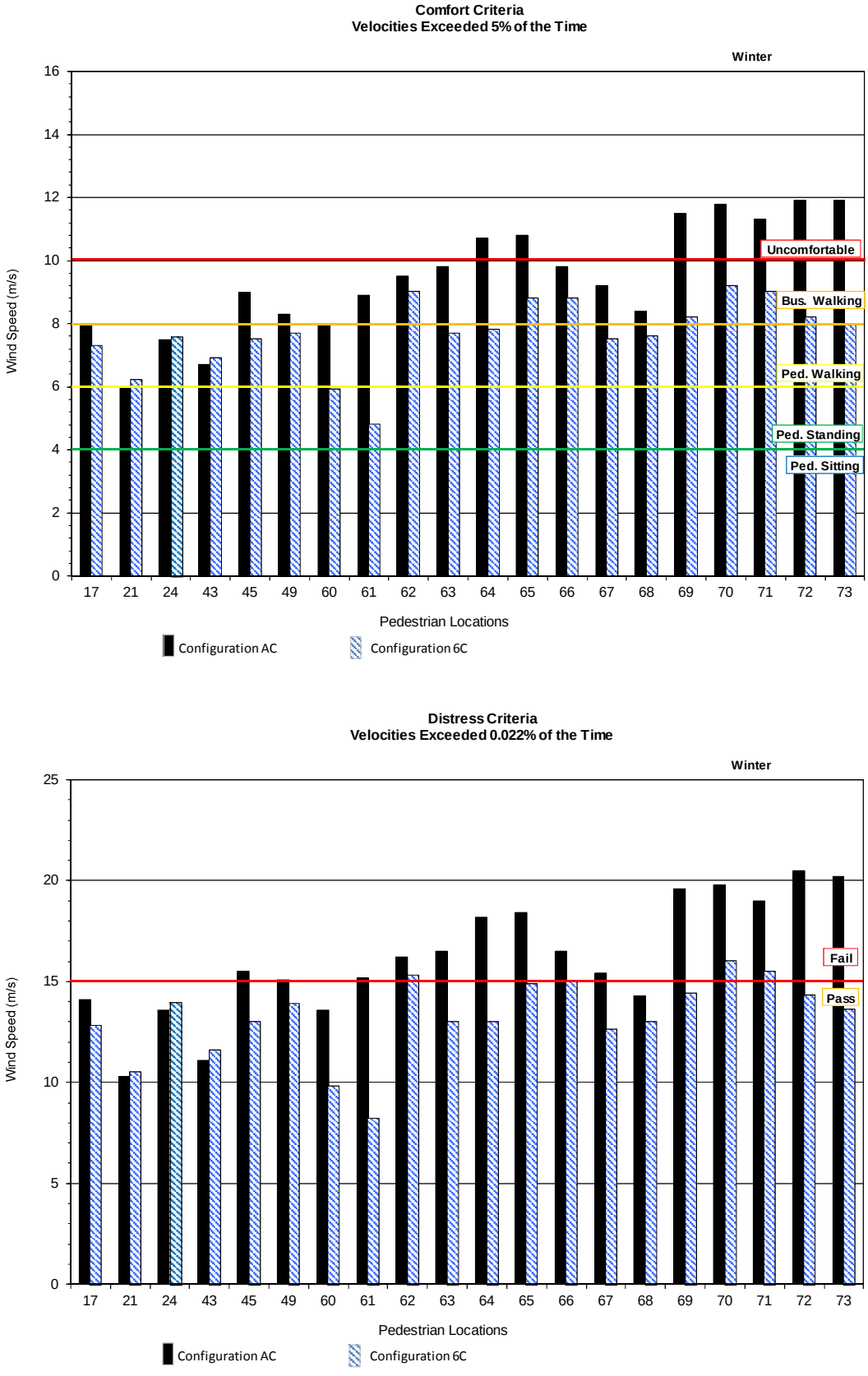


Figure 4g. Summary of pedestrian wind comfort/distress ratings, additional and repeat points, winter.

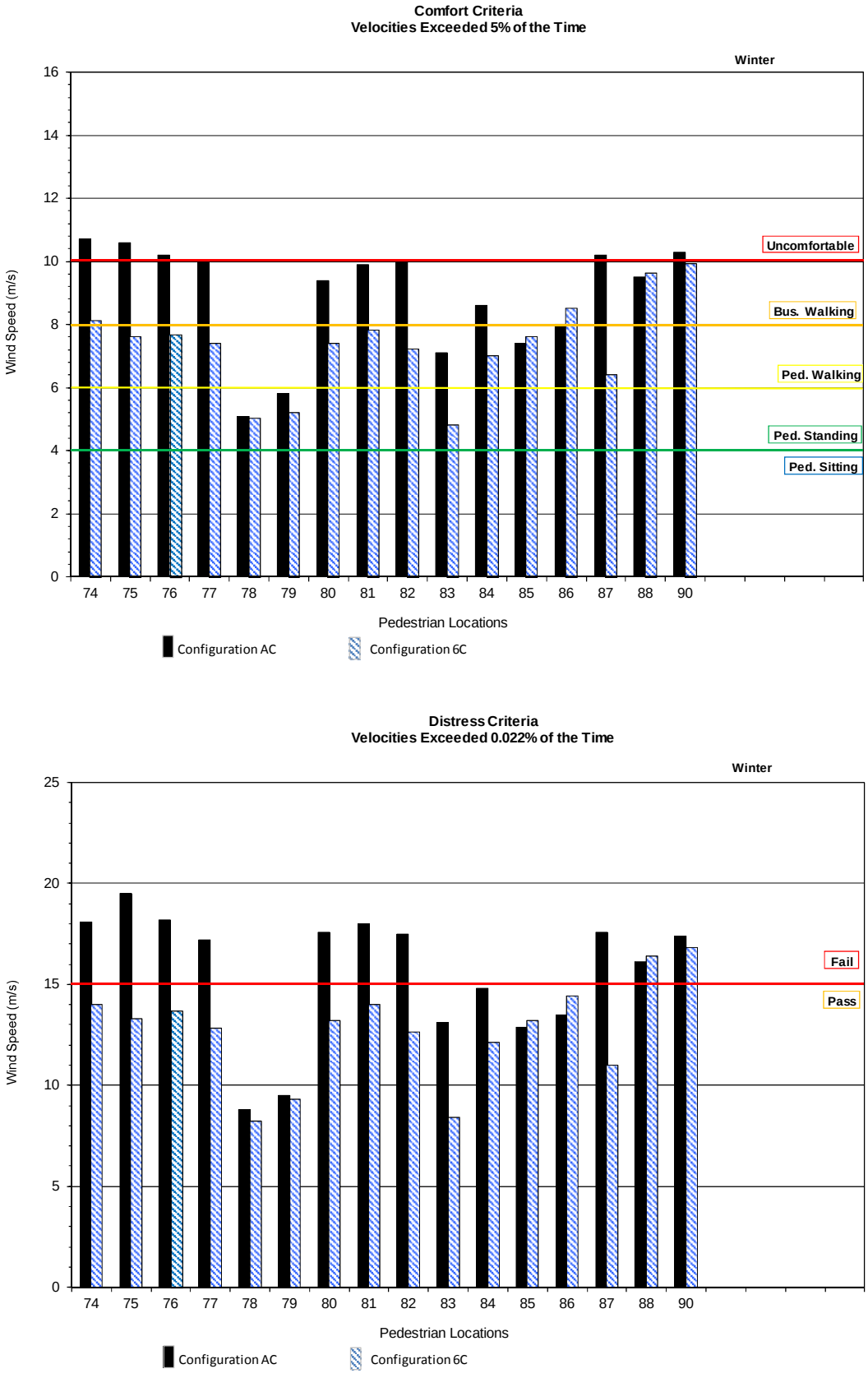


Figure 4h. Summary of pedestrian wind comfort/distress ratings, additional and repeat points, winter.

Original Test Points

ANNUAL		
	Configuration	
Location	AC	6C
3	4.8	1.8
4	5.3	2.7
5	9.4	5.7
6	9.6	5.4
7	9.0	7.8
8	9.8	5.5
9	8.9	8.0
10	10.0	7.3
11	9.6	7.6
12	8.1	6.5
13	5.6	5.0
17	6.4	6.1
18	8.1	7.2
19	9.5	5.9
20	6.5	7.4
21	5.0	4.8
22	6.2	5.5
23	5.8	5.9
24	6.3	5.9
25	6.4	4.0
26	5.8	3.8
27	7.9	6.5
28	6.2	5.2
30	7.0	7.0
31	7.8	7.0
32	4.8	4.9
33	9.2	7.4
34	9.4	6.9
35	8.9	5.9
36	7.2	4.8
40	5.8	6.0
41	4.7	5.1
43	5.8	5.7
44	7.4	7.7
45	9.0	6.3
46	6.5	3.8
47	8.7	6.5
48	7.6	5.5
49	7.6	6.9
50	6.5	6.2

WINTER		
	Configuration	
Location	AC	6C
3	5.1	1.9
4	5.7	2.9
5	10.3	6.1
6	10.6	5.6
7	9.9	8.6
8	11.0	6.2
9	10.0	9.1
10	11.1	7.9
11	10.7	8.4
12	8.9	7.2
13	6.2	5.5
17	7.4	6.8
18	9.2	8.1
19	10.8	6.7
20	7.2	8.3
21	5.6	5.4
22	7.0	6.1
23	6.5	6.6
24	7.0	6.5
25	7.1	4.5
26	6.6	4.4
27	8.8	7.3
28	6.9	5.9
30	7.8	7.9
31	8.7	7.7
32	5.2	5.4
33	10.3	8.3
34	10.4	7.6
35	10.0	6.6
36	8.1	5.5
40	6.5	6.7
41	5.1	5.5
43	6.5	6.4
44	8.3	8.7
45	10.1	7.0
46	7.3	4.3
47	9.7	7.2
48	8.5	6.2
49	8.3	7.6
50	7.3	6.9

Additional and Repeat Test Points

ANNUAL		
	Configuration	
Location	AC	6C
17	6.9	6.4
21	5.3	5.5
24	6.8	6.9
43	6.1	6.1
45	8.0	6.8
49	7.5	7.0
60	7.2	5.2
61	7.8	4.2
62	8.5	8.0
63	8.7	6.9
64	9.5	7.0
65	9.6	7.8
66	8.7	7.9
67	8.1	6.7
68	7.5	6.8
69	10.3	7.5
70	10.4	8.3
71	10.0	8.1
72	10.7	7.4
73	10.5	7.1
74	9.5	7.3
75	9.6	6.9
76	9.2	7.0
77	8.9	6.6
78	4.6	4.5
79	5.3	4.8
80	8.6	6.8
81	8.9	7.0
82	9.0	6.5
83	6.2	4.3
84	7.6	6.2
85	6.7	6.8
86	7.3	7.7
87	8.9	5.7
88	8.3	8.4
90	9.2	8.8

WINTER		
	Configuration	
Location	AC	6C
17	8.0	7.3
21	6.0	6.2
24	7.5	7.6
43	6.7	6.9
45	9.0	7.5
49	8.3	7.7
60	8.0	5.9
61	8.9	4.8
62	9.5	9.0
63	9.8	7.7
64	10.7	7.8
65	10.8	8.8
66	9.8	8.8
67	9.2	7.5
68	8.4	7.6
69	11.5	8.2
70	11.8	9.2
71	11.3	9.0
72	11.9	8.2
73	11.9	8.0
74	10.7	8.1
75	10.6	7.6
76	10.2	7.7
77	10.0	7.4
78	5.1	5.0
79	5.8	5.2
80	9.4	7.4
81	9.9	7.8
82	10.0	7.2
83	7.1	4.8
84	8.6	7.0
85	7.4	7.6
86	8.0	8.5
87	10.2	6.4
88	9.5	9.6
90	10.3	9.9

The values in each table are the larger of the mean and the gust equivalent mean wind speeds in m/s.

Figure 5. Summary of pedestrian conditions – comfort

Original Test Points

ANNUAL		
	Configuration	
Location	AC	6C
3	8.9	2.9
4	9.7	4.8
5	17.9	10.3
6	18.0	9.9
7	16.9	14.3
8	17.3	9.8
9	15.7	14.1
10	17.8	12.9
11	17.7	14.1
12	15.3	11.8
13	10.6	10.7
17	12.5	10.9
18	15.0	13.7
19	17.4	10.7
20	11.2	13.2
21	8.8	8.4
22	11.1	9.8
23	10.2	10.4
24	11.9	11.2
25	11.6	7.3
26	10.3	6.9
27	14.1	11.5
28	10.6	9.0
30	12.5	12.2
31	13.7	12.0
32	8.1	8.4
33	16.3	13.3
34	17.2	12.3
35	16.1	10.6
36	13.1	9.0
40	10.6	11.0
41	8.9	9.7
43	10.0	9.9
44	13.1	13.5
45	15.8	11.1
46	11.8	7.0
47	15.8	12.0
48	14.3	10.0
49	14.4	13.1
50	12.2	11.1

WINTER		
	Configuration	
Location	AC	6C
3	9.4	3.1
4	10.3	5.1
5	19.0	11.0
6	19.2	10.3
7	18.1	15.2
8	18.6	10.5
9	16.9	15.2
10	19.1	13.8
11	18.8	15.0
12	16.3	12.6
13	10.8	10.9
17	13.5	11.5
18	16.1	14.8
19	18.8	11.5
20	12.0	14.1
21	9.5	9.0
22	11.9	10.5
23	10.9	11.2
24	12.6	11.9
25	12.4	7.8
26	11.1	7.4
27	15.1	12.3
28	11.4	9.7
30	13.3	13.1
31	14.7	12.8
32	8.5	8.9
33	17.4	14.2
34	18.4	13.1
35	17.2	11.3
36	14.1	9.7
40	11.4	11.8
41	9.5	10.3
43	10.7	10.6
44	14.0	14.5
45	17.0	11.8
46	12.6	7.5
47	16.9	12.8
48	15.2	10.7
49	15.3	13.9
50	12.8	11.7

Additional and Repeat Test Points

ANNUAL		
	Configuration	
Location	AC	6C
17	13.1	11.9
21	9.6	9.8
24	12.8	13.1
43	10.3	10.8
45	14.4	12.2
49	14.1	13.0
60	12.7	9.1
61	14.1	7.7
62	15.1	14.3
63	15.3	12.1
64	17.0	12.1
65	17.2	13.9
66	15.4	14.0
67	14.4	11.8
68	13.3	12.1
69	18.3	13.5
70	18.5	14.9
71	17.7	14.5
72	19.1	13.4
73	18.8	12.7
74	16.8	13.1
75	18.3	12.5
76	17.1	12.8
77	16.0	12.0
78	8.2	7.9
79	9.1	9.1
80	16.6	12.4
81	16.9	13.1
82	16.4	11.8
83	12.1	7.8
84	13.8	11.4
85	12.1	12.4
86	12.6	13.4
87	16.3	10.3
88	15.0	15.2
90	16.1	15.7

WINTER		
	Configuration	
Location	AC	6C
17	14.1	12.8
21	10.3	10.5
24	13.6	14.0
43	11.1	11.6
45	15.5	13.0
49	15.1	13.9
60	13.6	9.8
61	15.2	8.2
62	16.2	15.3
63	16.5	13.0
64	18.2	13.0
65	18.4	14.9
66	16.5	15.0
67	15.4	12.6
68	14.3	13.0
69	19.6	14.4
70	19.8	16.0
71	19.0	15.5
72	20.5	14.3
73	20.2	13.6
74	18.1	14.0
75	19.5	13.3
76	18.2	13.7
77	17.2	12.8
78	8.8	8.2
79	9.5	9.3
80	17.6	13.2
81	18.0	14.0
82	17.5	12.6
83	13.1	8.4
84	14.8	12.1
85	12.9	13.2
86	13.5	14.4
87	17.6	11.0
88	16.1	16.4
90	17.4	16.8

The values in each table are the larger of the mean and the gust equivalent mean wind speeds in m/s.

Figure 6. Summary of pedestrian conditions – distress

Original Test Points

WINTER		
	Configuration	
Location	AC	6C
3	0.0	0.0
4	0.0	0.0
5	12.0	0.0
6	13.0	0.0
7	7.4	1.1
8	12.2	0.0
9	4.2	1.0
10	14.6	0.2
11	11.7	0.9
12	2.6	0.0
13	0.0	0.0
17	0.2	0.0
18	2.2	0.7
19	12.0	0.0
20	0.0	0.3
21	0.0	0.0
22	0.0	0.0
23	0.0	0.0
24	0.0	0.0
25	0.0	0.0
26	0.0	0.0
27	1.0	0.0
28	0.0	0.0
30	0.1	0.1
31	0.7	0.0
32	0.0	0.0
33	6.1	0.4
34	9.3	0.1
35	5.3	0.0
36	0.3	0.0
40	0.0	0.0
41	0.0	0.0
43	0.0	0.0
44	0.3	0.5
45	4.6	0.0
46	0.0	0.0
47	4.2	0.1
48	1.1	0.0
49	1.2	0.3
50	0.1	0.0

Maximum allowable hours seasonally: 0.9

Additional and Repeat Test Points

WINTER		
	Configuration	
Location	AC	6C
17	0.4	0.1
21	0.0	0.0
24	0.2	0.3
43	0.0	0.0
45	1.4	0.1
49	0.9	0.3
60	0.2	0.0
61	1.0	0.0
62	2.5	1.2
63	3.1	0.1
64	9.6	0.1
65	11.0	0.8
66	3.3	0.8
67	1.3	0.0
68	0.4	0.1
69	19.0	0.5
70	21.8	2.1
71	15.0	1.4
72	27.2	0.4
73	24.5	0.2
74	9.2	0.3
75	14.2	0.1
76	8.1	0.2
77	5.2	0.0
78	0.0	0.0
79	0.0	0.0
80	5.8	0.1
81	7.3	0.3
82	6.0	0.0
83	0.1	0.0
84	0.7	0.0
85	0.1	0.1
86	0.1	0.4
87	6.1	0.0
88	2.4	2.8
90	5.9	4.1

Maximum allowable hours seasonally: 0.9

Figure 7. Distress exceedance hours

Annual

Location	Gust 35 mph Configuration		Gust 45 mph Configuration		Gust 65 mph Configuration	
	AC	6C	AC	6C	AC	6C
3	6	0	0	0	0	0
4	18	0	0	0	0	0
5	551	35	139	1	3	0
6	457	21	93	1	1	0
7	445	94	90	7	1	0
8	537	11	110	0	1	0
9	372	176	60	16	0	0
10	518	61	105	3	1	0
11	494	134	104	13	1	0
12	423	107	103	9	2	0
13	22	9	0	0	0	0
17	121	57	16	3	0	0
18	292	210	44	26	0	0
19	476	35	99	2	1	0
20	20	64	0	3	0	0
21	5	3	0	0	0	0
22	72	22	4	1	0	0
23	33	35	1	1	0	0
24	101	64	9	5	0	0
25	100	0	8	0	0	0
26	37	0	1	0	0	0
27	360	98	64	7	0	0
28	53	8	2	0	0	0
30	174	171	19	16	0	0
31	180	70	17	3	0	0
32	2	3	0	0	0	0
33	394	93	64	6	0	0
34	544	88	131	6	2	0
35	509	47	108	2	1	0
36	216	8	30	0	0	0
40	45	64	2	4	0	0
41	7	17	0	0	0	0
43	11	9	0	0	0	0
44	162	163	14	14	0	0
45	454	43	80	2	1	0
46	115	0	10	0	0	0
47	488	84	114	6	2	0
48	298	26	49	1	0	0
49	310	177	64	26	1	0
50	109	65	11	4	0	0

Winter

Location	Gust 35 mph Configuration		Gust 45 mph Configuration		Gust 65 mph Configuration	
	AC	6C	AC	6C	AC	6C
3	5	0	0	0	0	0
4	11	0	1	0	0	0
5	207	20	67	2	3	0
6	180	10	50	1	1	0
7	177	49	48	6	1	0
8	226	9	63	0	2	0
9	168	93	38	13	1	0
10	215	33	59	3	2	0
11	199	64	56	9	2	0
12	155	53	47	7	2	0
13	14	5	1	0	0	0
17	66	36	13	3	0	0
18	139	102	30	19	0	0
19	207	26	57	2	2	0
20	15	40	1	4	0	0
21	5	3	0	0	0	0
22	43	16	4	1	0	0
23	23	25	1	2	0	0
24	47	32	7	4	0	0
25	50	0	6	0	0	0
26	26	0	2	0	0	0
27	153	56	38	6	1	0
28	35	8	3	0	0	0
30	83	90	14	13	0	0
31	90	42	14	4	0	0
32	1	3	0	0	0	0
33	174	53	40	6	1	0
34	214	51	68	6	3	0
35	214	31	61	2	2	0
36	105	7	22	0	0	0
40	27	37	2	4	0	0
41	6	11	0	1	0	0
43	9	8	0	0	0	0
44	82	87	12	12	0	0
45	204	28	51	2	1	0
46	62	0	9	0	0	0
47	198	49	62	6	2	0
48	128	18	30	1	0	0
49	117	75	32	15	1	0
50	54	38	7	3	0	0

Figure 8a. Traffic speed exceedance hours - original points

Annual

Location	Gust 35 mph Configuration		Gust 45 mph Configuration		Gust 65 mph Configuration	
	AC	6C	AC	6C	AC	6C
17	189	105	28	10	0	0
21	12	18	0	0	0	0
24	175	197	23	30	0	0
43	18	27	0	1	0	0
45	302	120	42	10	0	0
49	291	189	54	26	1	0
60	200	9	23	0	0	0
61	195	0	21	0	0	0
62	525	380	113	68	2	1
63	270	38	32	1	0	0
64	483	53	96	2	1	0
65	521	165	108	16	1	0
66	345	155	51	14	0	0
67	289	116	38	9	0	0
68	162	89	15	6	0	0
69	468	97	88	7	1	0
70	638	203	143	24	2	0
71	481	162	91	16	1	0
72	771	157	206	16	6	0
73	734	100	186	6	4	0
74	518	135	104	12	1	0
75	754	162	236	18	9	0
76	605	157	166	16	4	0
77	416	82	84	5	1	0
78	2	1	0	0	0	0
79	8	3	0	0	0	0
80	531	142	161	16	6	0
81	609	196	168	28	5	0
82	504	91	120	6	2	0
83	98	1	11	0	0	0
84	267	84	44	6	0	0
85	87	149	5	14	0	0
86	127	169	10	17	0	0
87	312	10	45	0	0	0
88	476	492	99	105	1	2
90	339	238	45	24	0	0

Winter

Location	Gust 35 mph Configuration		Gust 45 mph Configuration		Gust 65 mph Configuration	
	AC	6C	AC	6C	AC	6C
17	100	61	21	9	0	0
21	11	15	0	1	0	0
24	73	79	14	17	0	0
43	14	20	1	1	0	0
45	151	63	31	9	0	0
49	118	82	28	16	1	0
60	97	9	17	0	0	0
61	103	0	17	0	0	0
62	210	164	60	41	2	1
63	130	25	23	2	0	0
64	202	33	54	2	1	0
65	215	84	59	13	2	0
66	155	80	33	11	0	0
67	136	60	27	8	0	0
68	86	51	13	5	0	0
69	202	49	52	6	1	0
70	265	93	80	16	3	0
71	210	81	54	12	1	0
72	309	74	108	12	6	0
73	299	54	100	6	4	0
74	230	67	64	10	2	0
75	274	76	108	13	8	0
76	230	77	82	12	4	0
77	177	47	50	5	1	0
78	2	1	0	0	0	0
79	6	2	0	0	0	0
80	183	64	66	11	5	0
81	226	86	79	17	4	0
82	200	51	65	6	3	0
83	56	1	10	0	0	0
84	123	46	30	5	1	0
85	48	73	5	11	0	0
86	68	85	9	14	0	0
87	156	9	33	0	0	0
88	213	214	60	61	2	2
90	142	113	27	18	0	0

Figure 8b. Traffic speed exceedance hours - additional and repeat points.

Lowest (worst) trigger gust wind speeds at airport across all test locations close to roads
Configuration AC, original, repeat, and additional points

Direction	Gust 35 mph at BWP		Gust 45 mph at BWP		Gust 65 mph at BWP		Worst location
	$U_{pk10m,apt}$ (mph)	Annual exceedance hours at airport	$U_{pk10m,apt}$ (mph)	Annual exceedance hours at airport	$U_{pk10m,apt}$ (mph)	Annual exceedance hours at airport	
N	39.9	1.8	51.4	0.0	74.2	0.0	12
NNE	32.2	19.8	41.4	2.2	59.8	0.0	6
NE	30.7	2.0	39.5	0.0	57.0	0.0	63
ENE	29.6	4.1	38.0	0.1	55.0	0.0	17
E	29.9	9.1	38.4	0.5	55.5	0.0	17
ESE	29.8	4.6	38.4	0.2	55.4	0.0	65
SE	31.6	2.8	40.7	0.1	58.7	0.0	75
SSE	42.4	0.0	54.5	0.0	78.7	0.0	34
S	44.8	0.0	57.6	0.0	83.2	0.0	8
SSW	33.6	13.6	43.2	1.2	62.4	0.0	87
SW	29.4	136.2	37.8	28.6	54.6	0.2	73
WSW	29.5	269.5	38.0	89.9	54.9	3.6	72
W	30.9	392.3	39.7	135.2	57.3	5.6	80
WNW	31.7	99.4	40.8	24.3	59.0	0.4	5
NW	37.2	1.6	47.8	0.0	69.0	0.0	5
NNW	50.6	0.0	65.0	0.0	93.9	0.0	10

Note: Points 20-28, 60-62, 88, and 90 are not considered.

Lowest (worst) trigger gust wind speeds at airport across all test locations close to roads
Configuration 6C, original, repeat, and additional points

Direction	Gust 35 mph at BWP		Gust 45 mph at BWP		Gust 65 mph at BWP		Worst location
	$U_{pk10m,apt}$ (mph)	Annual exceedance hours at airport	$U_{pk10m,apt}$ (mph)	Annual exceedance hours at airport	$U_{pk10m,apt}$ (mph)	Annual exceedance hours at airport	
N	45.2	0.4	58.1	0.0	83.9	0.0	80
NNE	35.6	9.4	45.7	0.6	66.1	0.0	6
NE	33.5	0.6	43.1	0.0	62.3	0.0	10
ENE	30.9	2.6	39.7	0.1	57.3	0.0	17
E	29.3	10.5	37.7	0.7	54.5	0.0	17
ESE	31.1	3.1	40.0	0.1	57.8	0.0	75
SE	33.4	1.4	42.9	0.0	62.0	0.0	13
SSE	41.9	0.0	53.8	0.0	77.8	0.0	76
S	45.7	0.0	58.8	0.0	84.9	0.0	9
SSW	43.5	1.1	55.9	0.0	80.7	0.0	17
SW	39.3	20.3	50.6	0.9	73.0	0.0	30
WSW	37.7	94.2	48.4	14.5	70.0	0.1	18
W	38.9	151.6	50.0	25.3	72.2	0.1	81
WNW	38.9	33.6	50.1	3.9	72.3	0.0	70
NW	43.1	0.2	55.4	0.0	80.1	0.0	70
NNW	51.0	0.0	65.6	0.0	94.7	0.0	50

Note: Points 20-28, 60-62, 88, and 90 are not considered.

Figure 9. Lowest (worst) trigger gust wind speeds at airport across all test locations close to roads.

Minutes of Pre-application Presentation

Bridgewater Place Wind Mitigation Scheme

City Plans Panel on 16th January 2014

Minutes:

Plans, graphics, photographs and a model of the proposals were displayed at the meeting. A Members site visit had taken place earlier in the day. Members considered a report of the Chief Planning Officer setting out the proposed wind mitigation measures to address the wind problems in the vicinity of Bridgewater Place and received a presentation on behalf of the applicant.

The Deputy Area Planning Manager presented the report; briefly outlined the history of the site and the problems which had occurred in relation to high winds; referred to the tragic incident in March 2011 which had resulted in the death of a pedestrian and the serious injury of another and the recommendations of the Coroner resulting from the inquest, which were outlined in the report before Panel Inaccuracies in the report relating to the name of the applicant were clarified. Members were also informed that wind testing had been carried out by CPP Wind, a wind engineering company, which had no commercial connection with CPPI, the owners of Bridgewater Place

The Panel then received a presentation from representatives of CPPI, Buro Happold – Engineering Consultants and Chetwoods Architects who provided information on the following:

- wind direction, which in Leeds was predominantly from the west, along the river corridor, which when it met Bridgewater Place would be directed upwards, downwards and around and that the issue being experienced at the site was being caused by the downwash, with higher wind speeds around the junction of Water Lane and Victoria Road and some funnelling by The Grove Public House
- that many options had been considered to address the problem with the proposed measures comprising three elements; a canopy; porous screens and a series of baffles over Water Lane, designed to slow the wind down, with tests having shown that the measures led to reduced wind speeds
- that discussions were taking place with the Council's Highways Officers about adjustments to the junction of Water Lane and Victoria Road to identify clear zones for the columns which would support the baffles, whilst retaining all of the standard highway requirements

- that a simple, but effective solution was being considered with a glass canopy to the Water Lane frontage, which would take support from the basement structure of the building and would extend around to the residential entrance
- at the vehicular entrance to the basement and residential units, three 12m to 18m high vertical screens were proposed. These would be sited to avoid any conflict with traffic flow on the access road off Water Lane. A further, smaller screen at 4m high would be sited off Back Row, near to The Grove Public House, with this screen also being porous
- the four baffles would be of differing length, each set on four columns at a height of 6m above the carriageway, at their lowest point and be porous, with holes of 60-100mm in size. Similar baffle designs had been used on building structures in Manchester, Copenhagen and Barcelona
- the timetable for the scheme, with the aim to be on site by the end of 2014

Members discussed the proposals and commented on the following

matters:

- whether the science had advanced since the building had been erected. Members were advised that the science was constantly advancing and that when considering the mitigation measures a number of constraints had been created which had been presented to the architect to be reflected in the design of the proposals. Whilst the architect had been able to question some issues around appearance, the engineering aspects of the scheme could not be questioned
- the different shapes of the baffles and the reasons for this. Members were informed that although different shapes, the baffles were designed on the same geometric principle and were varied to avoid identical replication and to move away from the appearance of motorway gantries
- the effectiveness of the vertical screen by The Grove and concerns that injuries in high winds could still occur at this location. Members were advised that two aspects were considered in respect of wind, these being comfort and

safety and that when the screen was in place it would address the safety aspects. Concerns were expressed that this information differed to what was indicated on the site visit

- how the baffles sited so high would benefit pedestrians and the extent of the area covered by the mitigation measures. Members were informed that each of the three elements performed a different function; that the vertical screens on the corner would slow the wind down as it came around the corner and the baffles would dissipate the wind further moving some of it upwards and slowing some of it down and the fact that the baffles were 6m high would still slow the wind down, the effect of which would be felt on both sides of the pavement. As part of the testing which had been carried out on the proposals, 12 wind directions had been looked at
- whether baffles sited in the middle of a road had been used elsewhere. Whilst the representative of Buro Happold was not aware of a combination of porous screens above the highways and vertical screens being used to mitigate wind impact, a large amount of modelling had been undertaken and there were examples of other types of gantries in use over highways
- whether the proposals had taken into account any unimplemented planning permissions in the area. The Chief Planning Officer advised that there were currently no planning applications which would impact on the proposals
- the impressive engineering work carried out to address the issues but that assurances were needed that the proposals would eliminate strong winds from the site
- the need for the design of the measures to be as attractive as possible to reflect the modern landscape which now existed down Water Lane and to ensure the existing views from the corner of Water Lane were retained, if possible
- the loss of the left turn lane on Water Lane, with the view being expressed that this was acceptable and that there should be a reduction in traffic into City Square
- the quality of the presentation and a request that this be e-mailed to Panel Members

- whether the proposed structures would be classed as street furniture and where responsibility for these would rest. The Transport Development Services Manager advised that discussions on this issue were taking place with the owners of the building but that as the Council had no expertise in maintaining such structures, the preference of Highways was for the owner to retain responsibility, with Members requiring this to be conditioned. The representative of CPPI made reference to possible financial issues if the building's owner had to assume responsibility for the maintenance of the wind mitigation measures. Concerns were raised and, although it was accepted this was not a matter for the Plans Panel to determine, Members' views on this matter were clear

In response to the specific questions in the report, the Panel provided the following responses:

- that on the basis of the information which had been provided, Members were satisfied that all potential wind issues around the site had been considered but that Members would only have certainty once the measures were in place and were shown to be effective
- that Members were satisfied with the extent of the area covered by the wind study
- in terms of further work to be undertaken by the owner/applicants, to note the concerns which remained about the mitigation measures at The Grove Public House and whether further measures could be introduced at this location
- that Members were supportive of an approach which achieved the necessary wind mitigation but also advanced an attractive design as well

RESOLVED - To note the report, the presentation and the comments now made.