

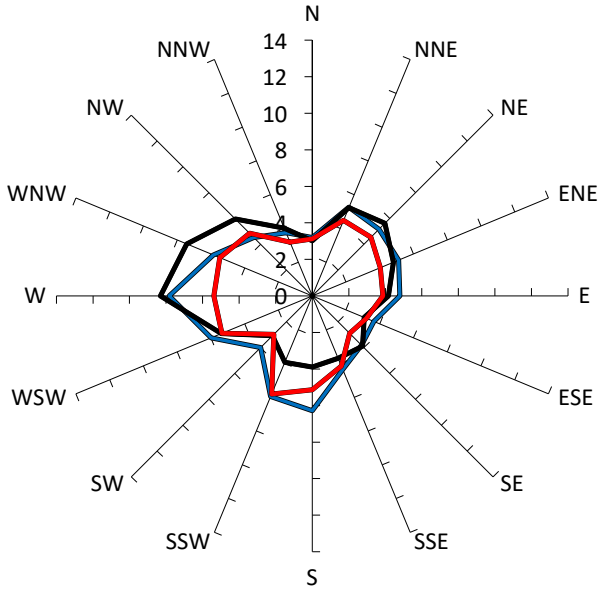
Attachment B26(e)

**Pedestrian Wind Environment Study
Appendices – Waterloo Estate (South) –
Land and Housing Corporation**

APPENDIX A - DIRECTIONAL PLOTS OF THE WIND TUNNEL RESULTS

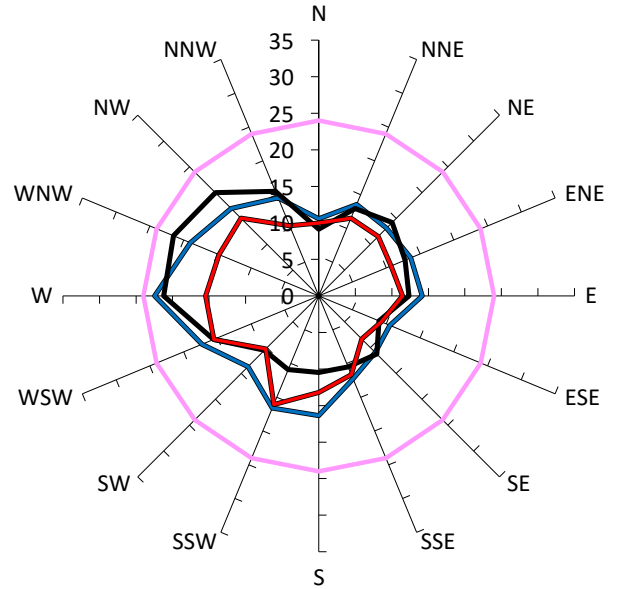
Results for Point 01

Gust Equivalent Mean (m/s)



Comfort Criteria: 6m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

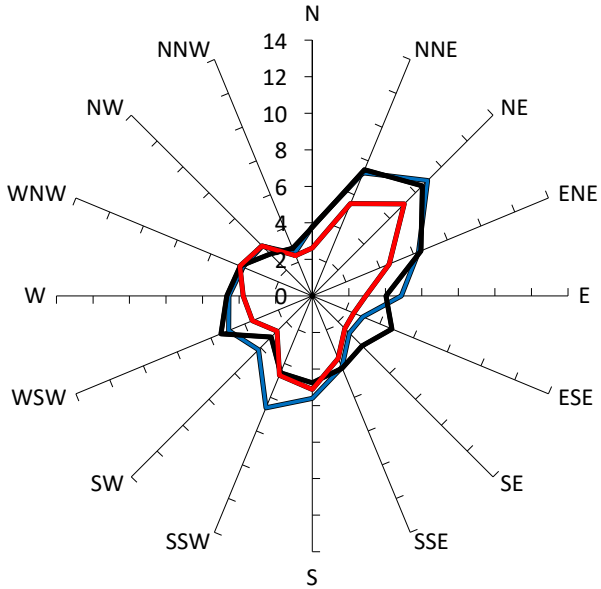
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Short Exposure Activities (6m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	11%	22
—	Existing Site	11%	22
—	With inclusion of Existing and Retained Trees	4%	16
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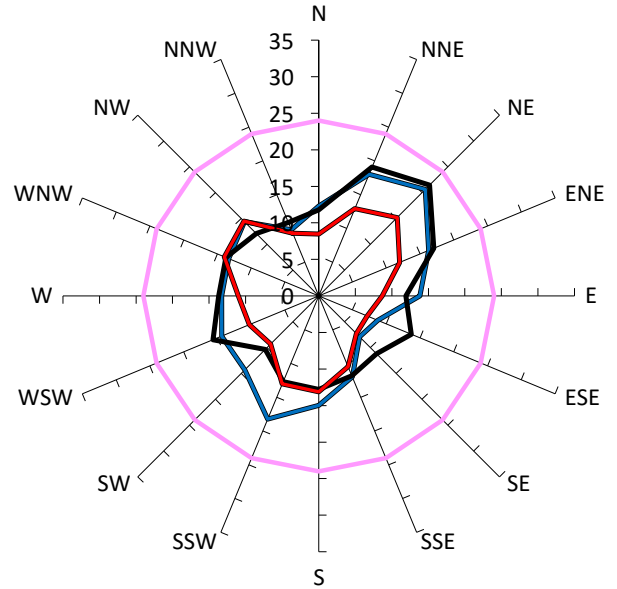
Results for Point 02

Gust Equivalent Mean (m/s)



Comfort Criteria: 6m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

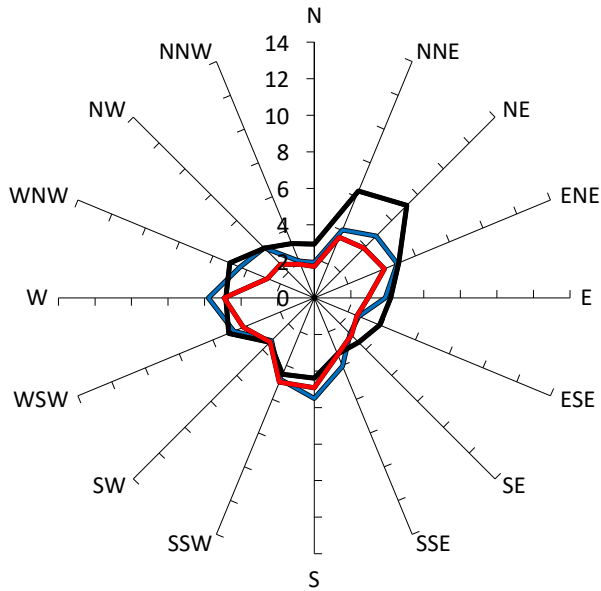
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Short Exposure Activities (6m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	16%	21
—	Existing Site	14%	21
—	With inclusion of Existing and Retained Trees	5%	15
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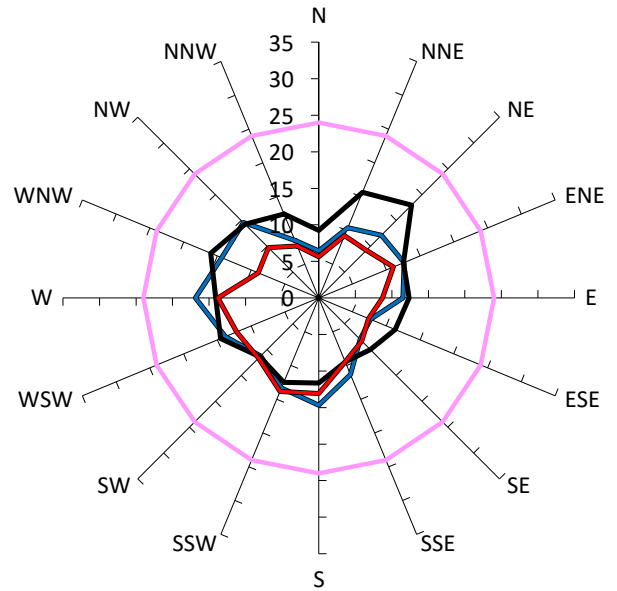
Results for Point 03

Gust Equivalent Mean (m/s)



Comfort Criteria: 6m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

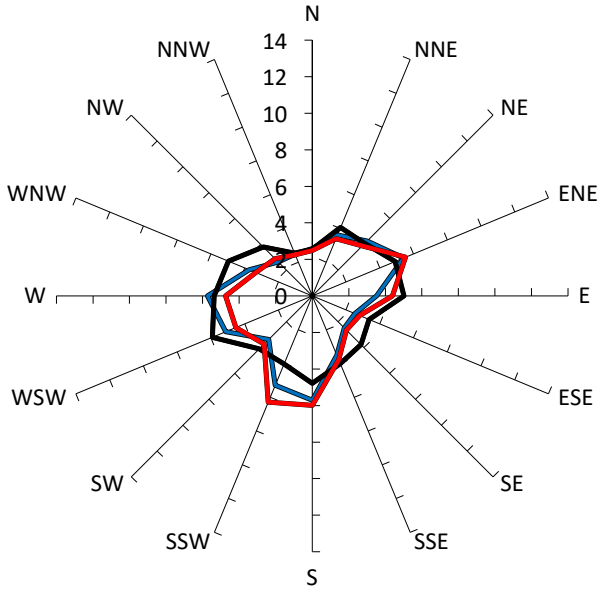
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Short Exposure Activities (6m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	3%	17
Existing Site	8%	18
With inclusion of Existing and Retained Trees	1%	14

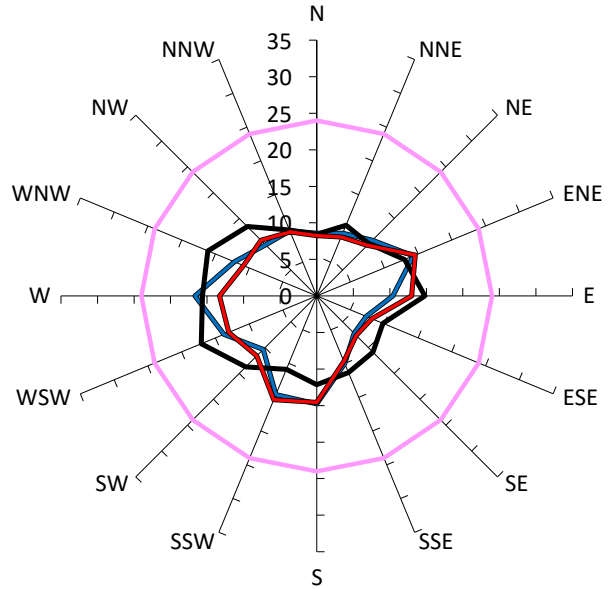
Results for Point 04

Gust Equivalent Mean (m/s)



Comfort Criteria: 6m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

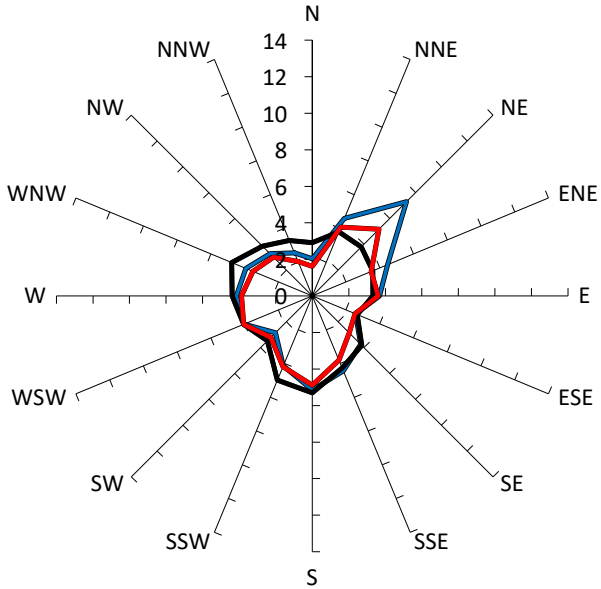
GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Short Exposure Activities (6m/s). Safety Limit (24m/s).	5%	24
— With development as proposed, no vegetation	3%	17
— Existing Site	4%	17
— With inclusion of Existing and Retained Trees	4%	15
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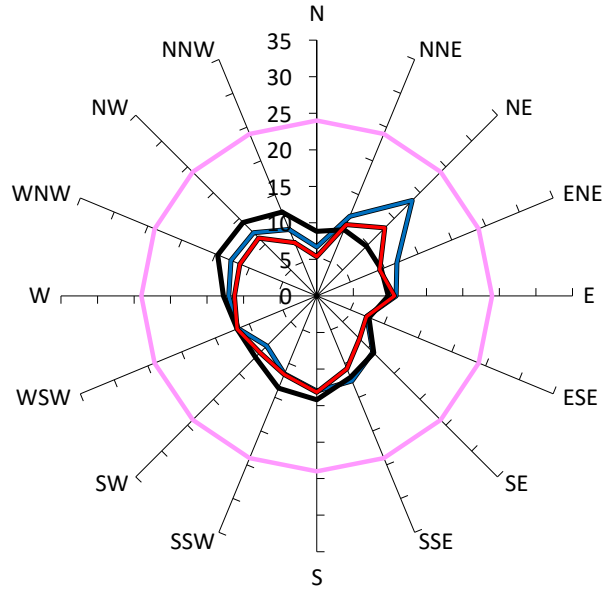
Results for Point 05

Gust Equivalent Mean (m/s)



Comfort Criteria: 6m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

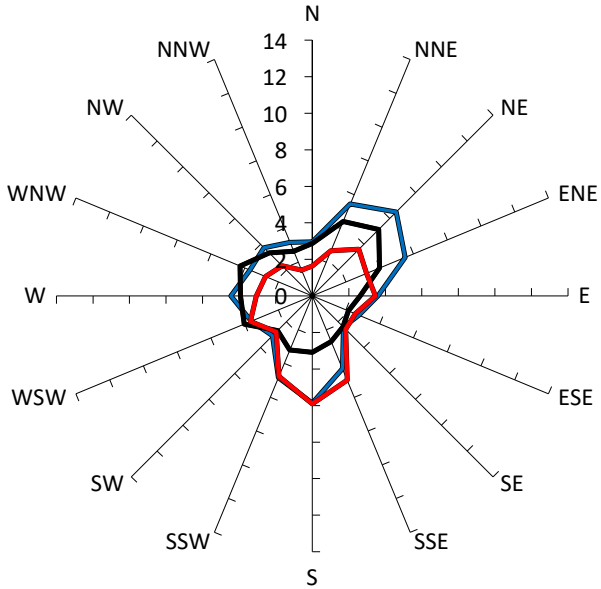
GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Short Exposure Activities (6m/s). Safety Limit (24m/s).	5%	24
— With development as proposed, no vegetation	6%	18
— Existing Site	2%	15
— With inclusion of Existing and Retained Trees	1%	13
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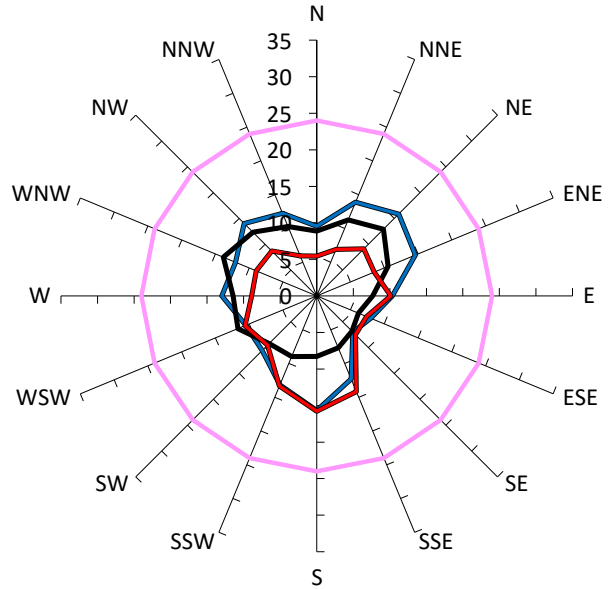
Results for Point 06

Gust Equivalent Mean (m/s)



Comfort Criteria: 6m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

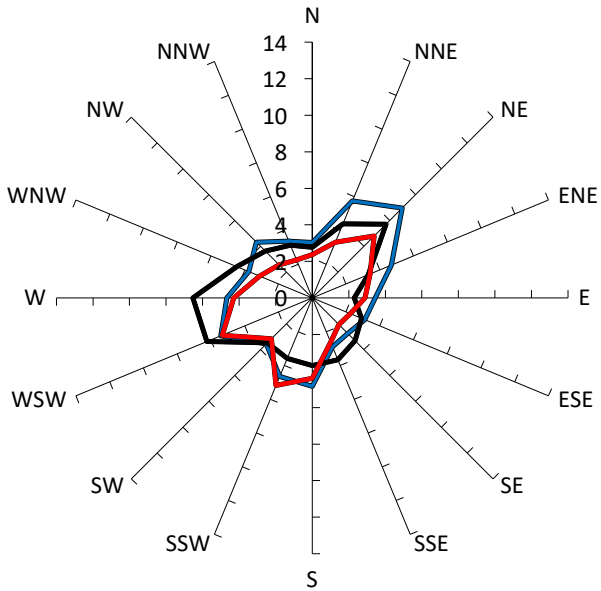
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Short Exposure Activities (6m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	5%	16
—	Existing Site	1%	14
—	With inclusion of Existing and Retained Trees	2%	16
—			
—			
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—			
—			

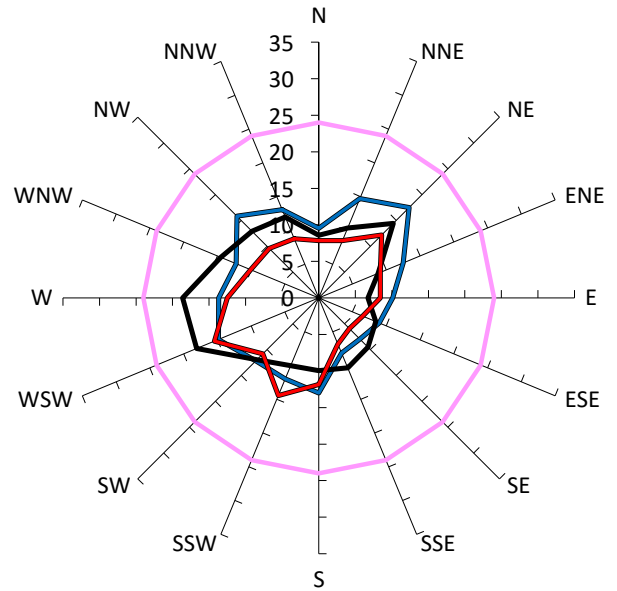
Results for Point 07

Gust Equivalent Mean (m/s)



Comfort Criteria: 6m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

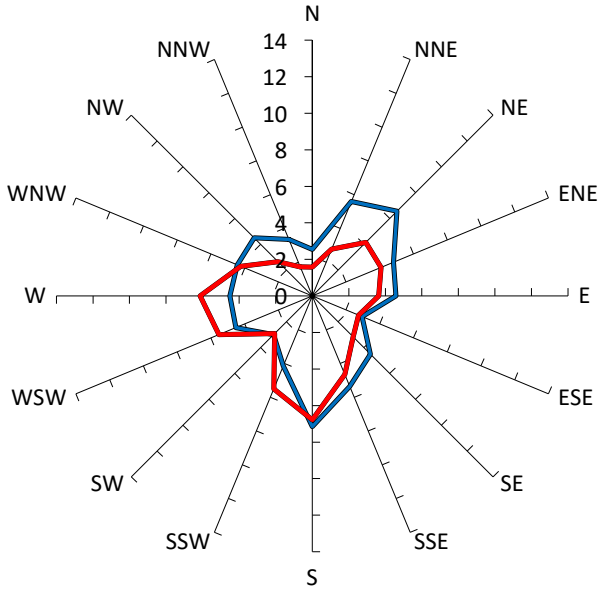
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Short Exposure Activities (6m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	6%	17
Existing Site	5%	19
With inclusion of Existing and Retained Trees	2%	15

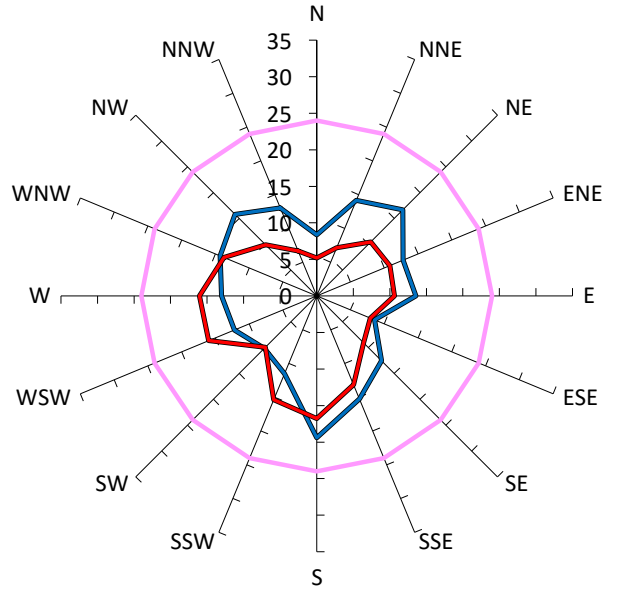
Results for Point 08

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

1%

19

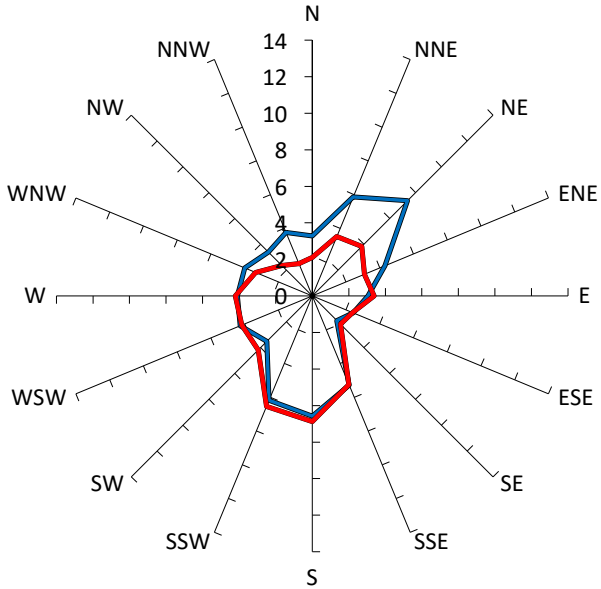
— With inclusion of Existing and Retained Trees

1%

17

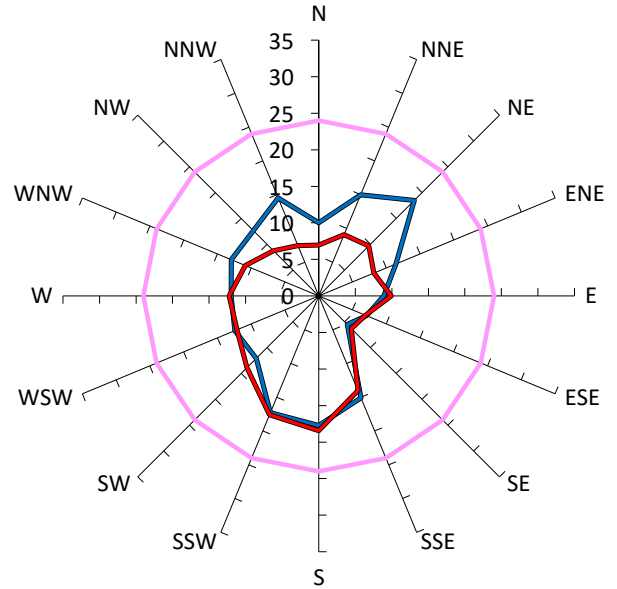
Results for Point 09

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

1%

18

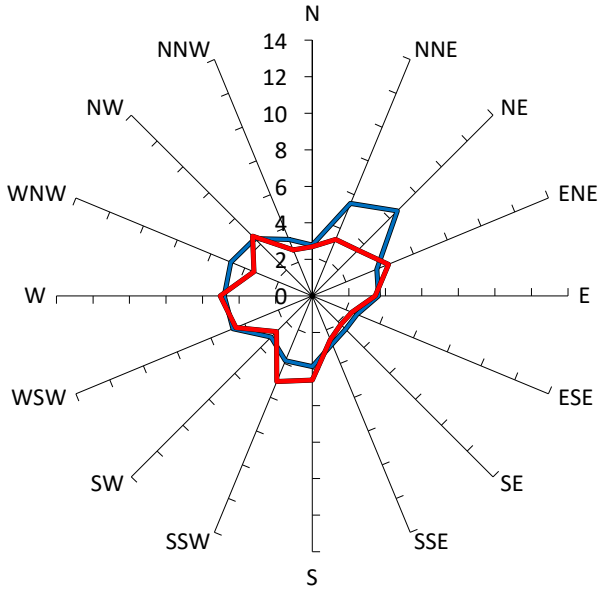
— With inclusion of Existing and Retained Trees

1%

18

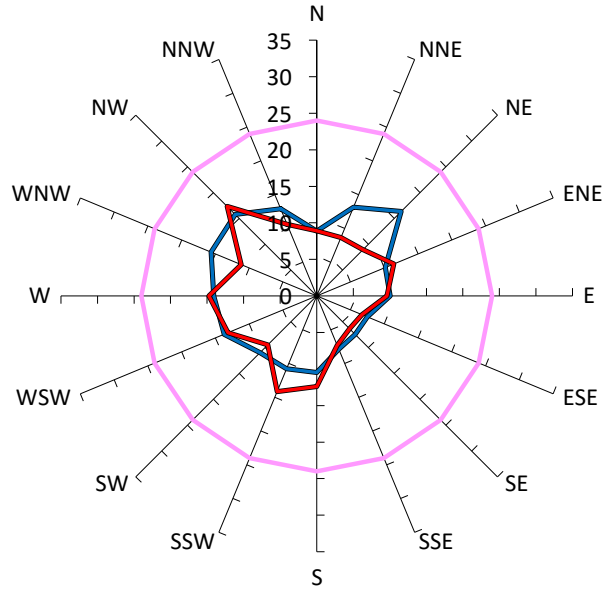
Results for Point 10

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

1%

16

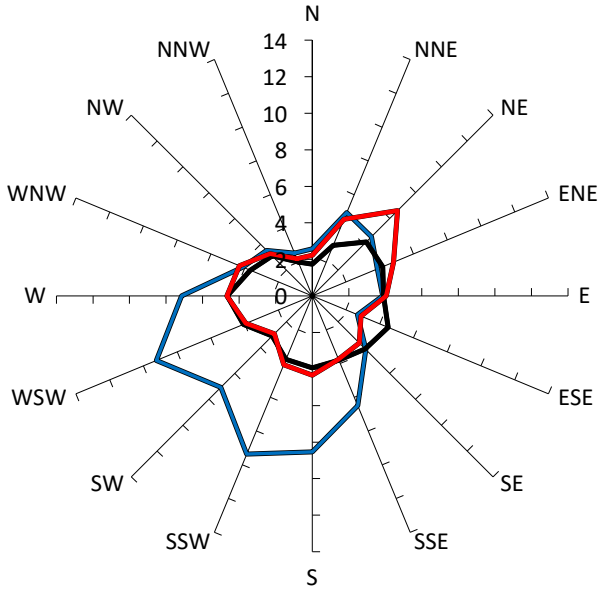
— With inclusion of Existing and Retained Trees

0%

17

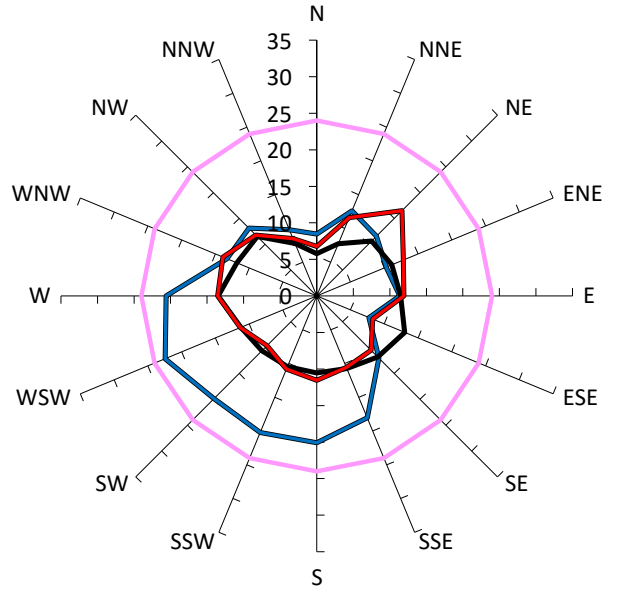
Results for Point 11

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

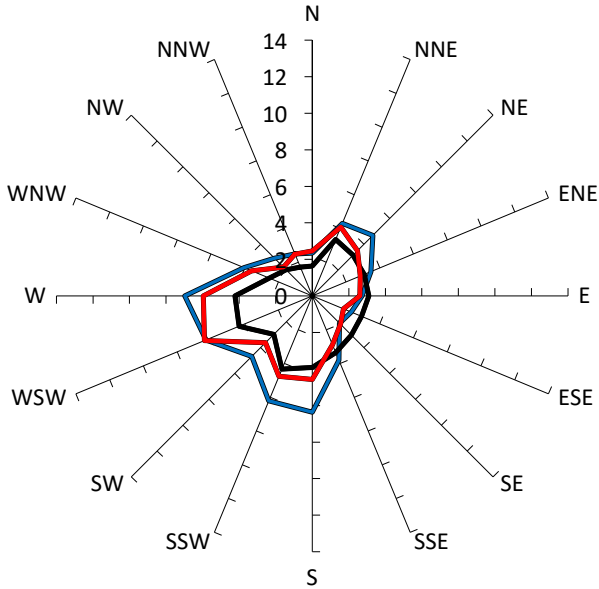
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	9%	22
—	Existing Site	0%	13
—	With inclusion of Existing and Retained Trees	0%	16
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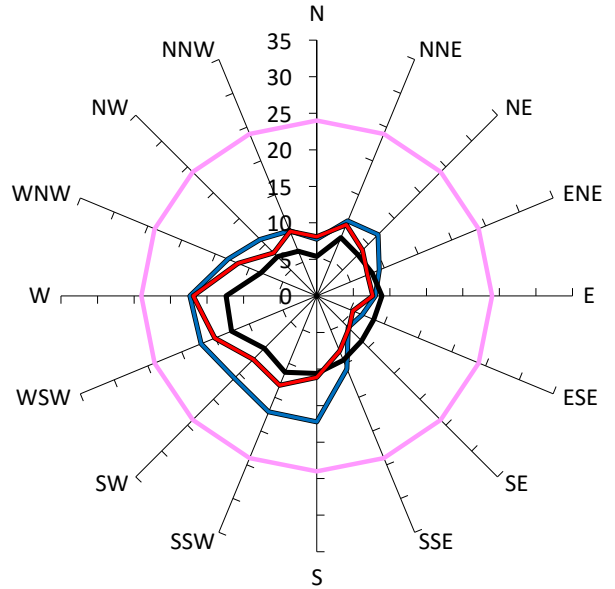
Results for Point 12

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

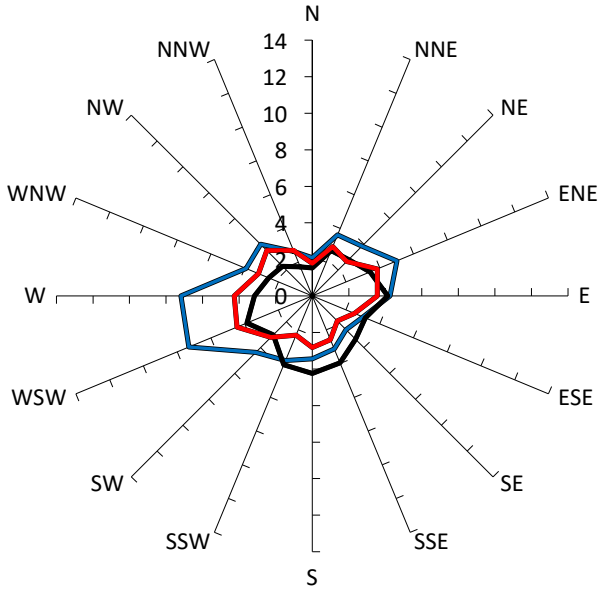
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	1%	17
Existing Site	0%	13
With inclusion of Existing and Retained Trees	1%	17

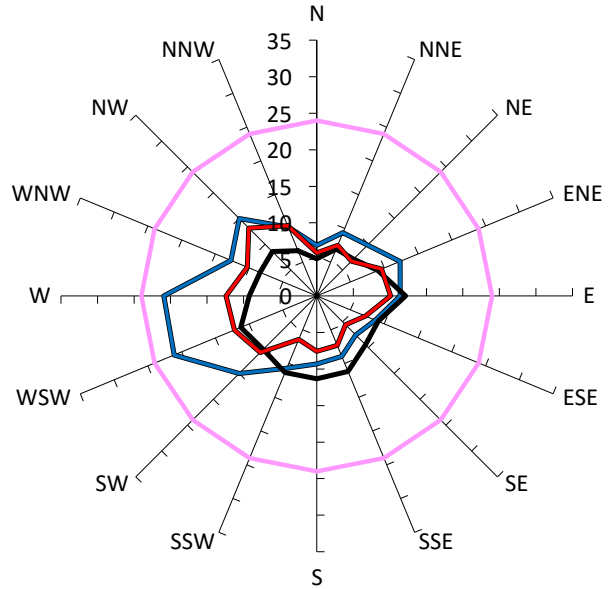
Results for Point 13

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

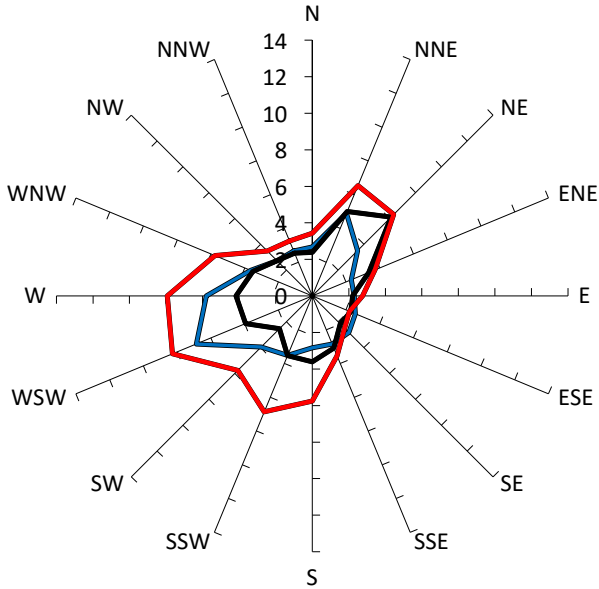
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	2%	21
—	Existing Site	0%	12
—	With inclusion of Existing and Retained Trees	0%	13
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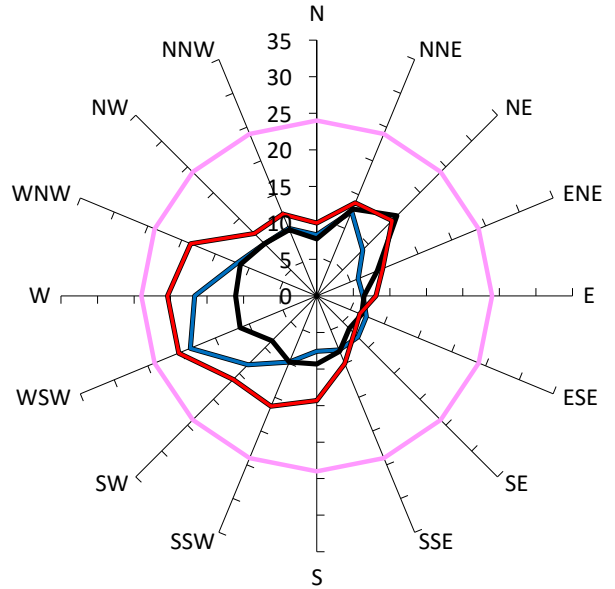
Results for Point 14

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	19
—	Existing Site	0%	16
—	With inclusion of Existing and Retained Trees	4%	20

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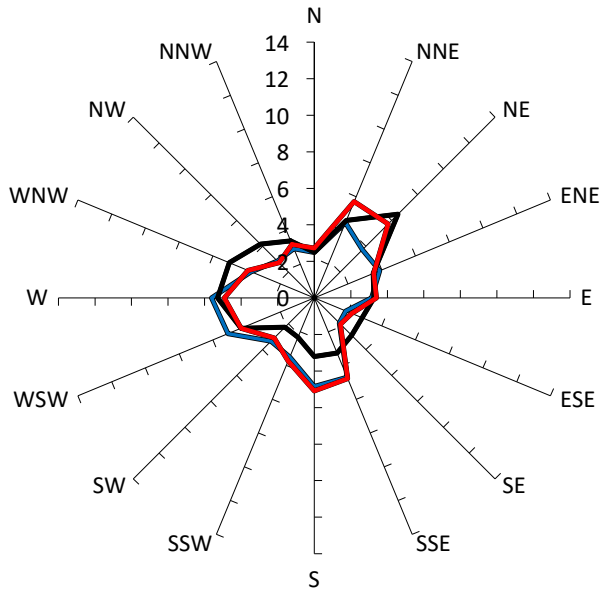
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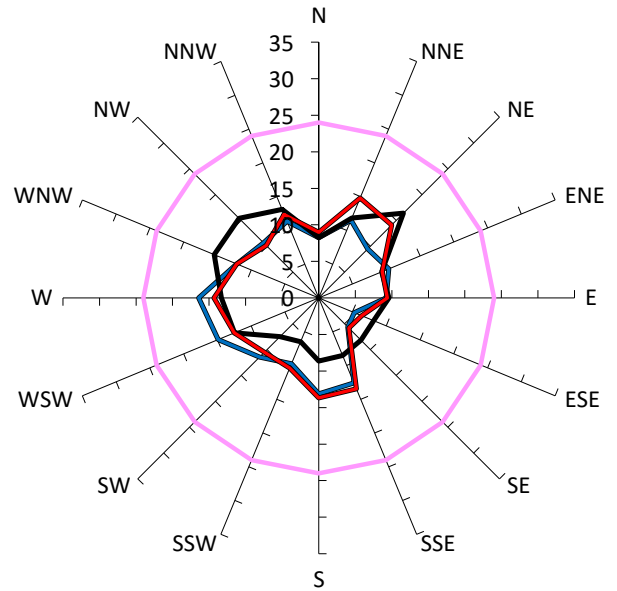
Results for Point 15

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

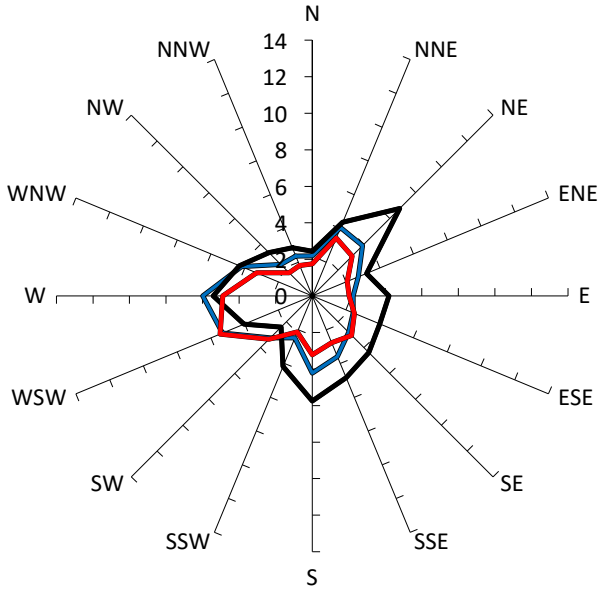
GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
— With development as proposed, no vegetation	0%	16
— Existing Site	0%	16
— With inclusion of Existing and Retained Trees	0%	15
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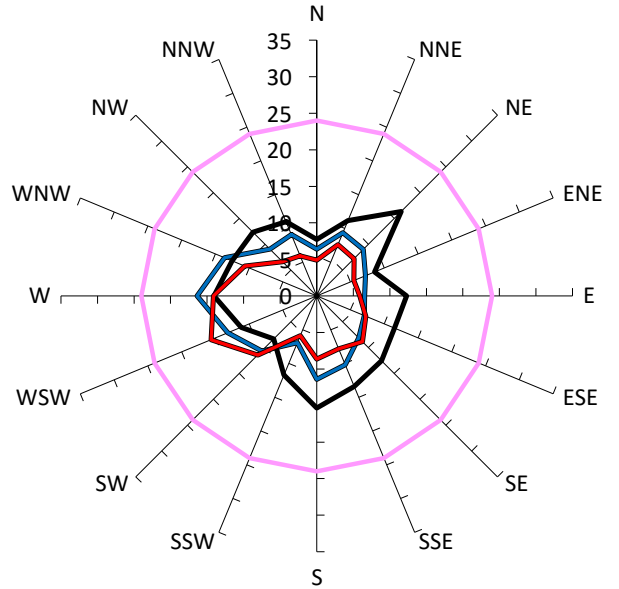
Results for Point 16

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

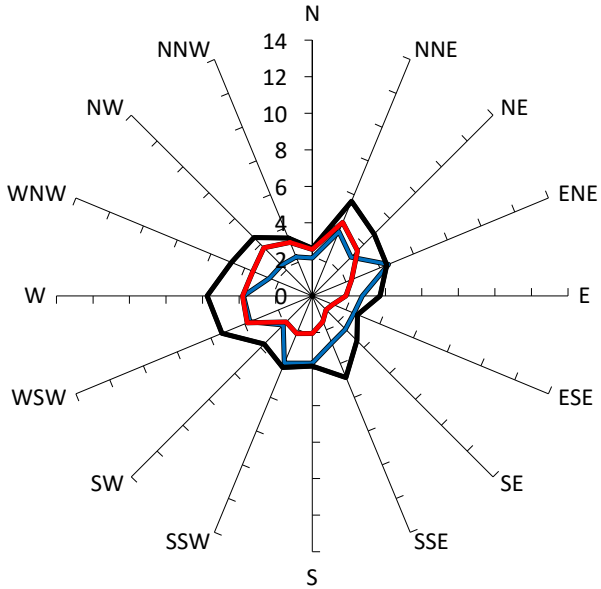
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	0%	16
—	Existing Site	1%	16
—	With inclusion of Existing and Retained Trees	0%	16
—			
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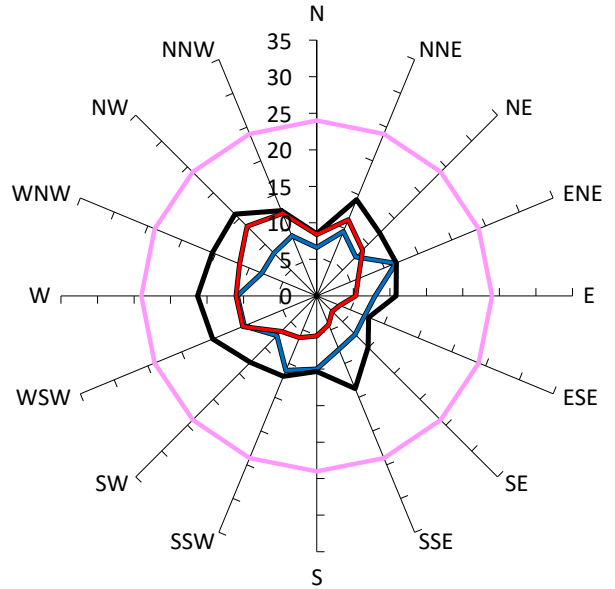
Results for Point 17

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

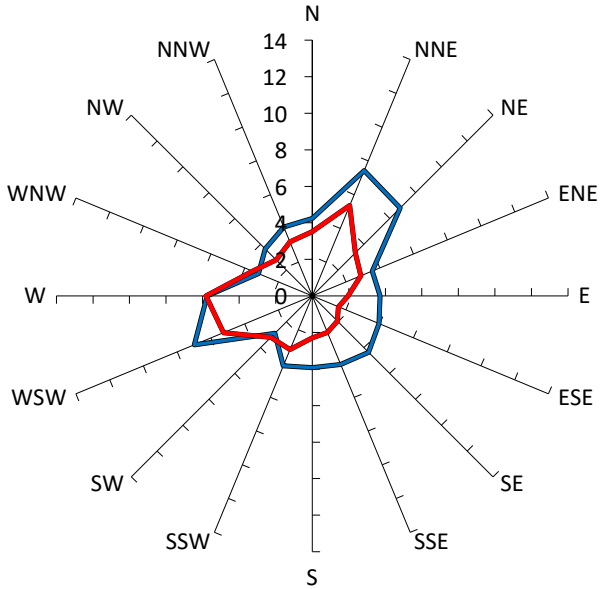
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	0%	12
—	Existing Site	1%	16
—	With inclusion of Existing and Retained Trees	0%	13
—			
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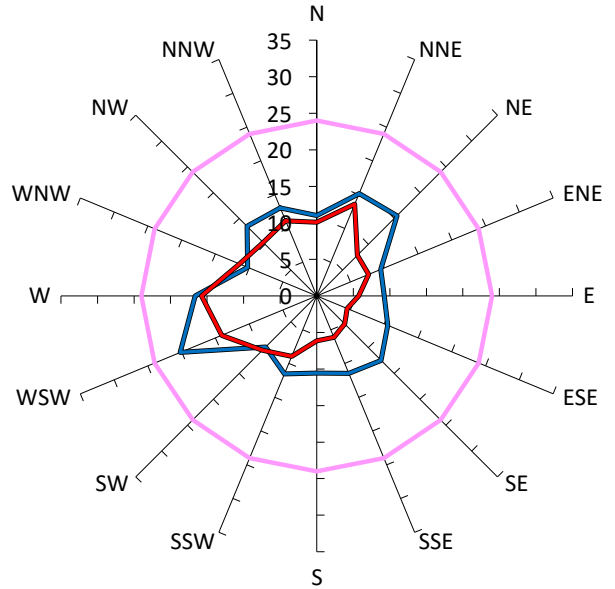
Results for Point 18

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

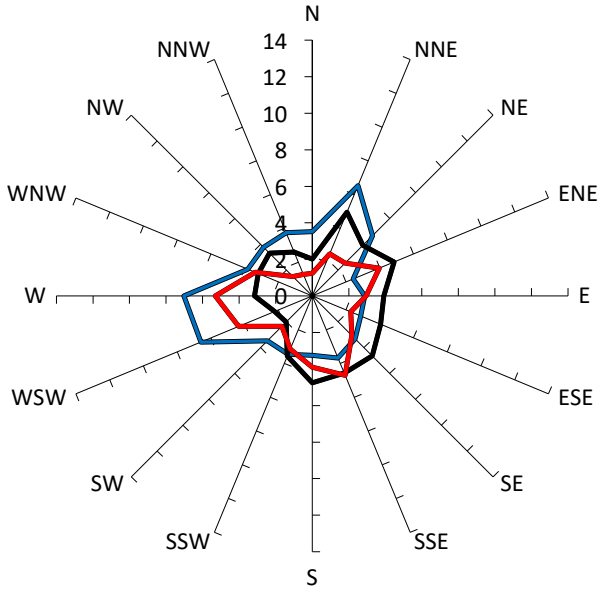
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	2%	20
With inclusion of Existing and Retained Trees	0%	16

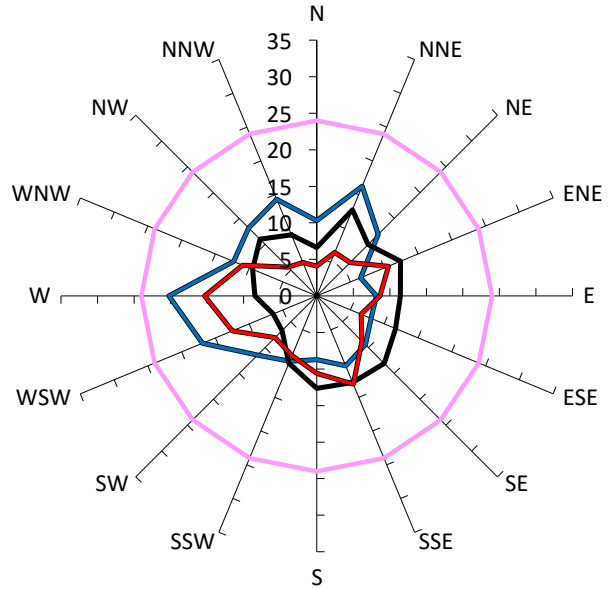
Results for Point 19

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

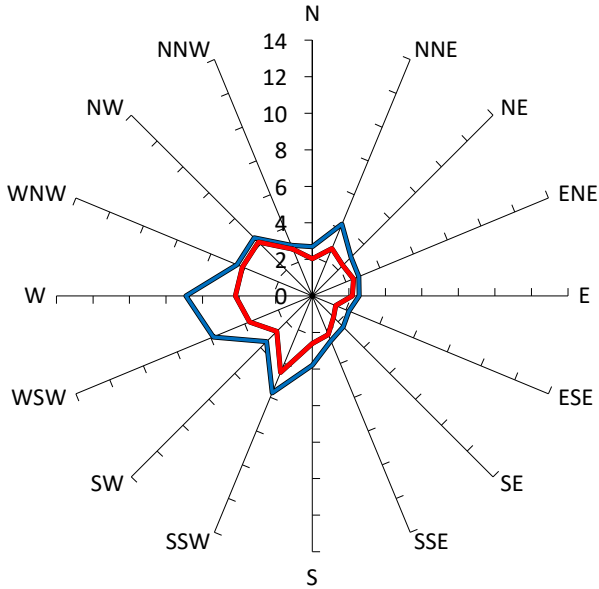
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	20
—	Existing Site	0%	13
—	With inclusion of Existing and Retained Trees	0%	15
—			
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—			
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—			

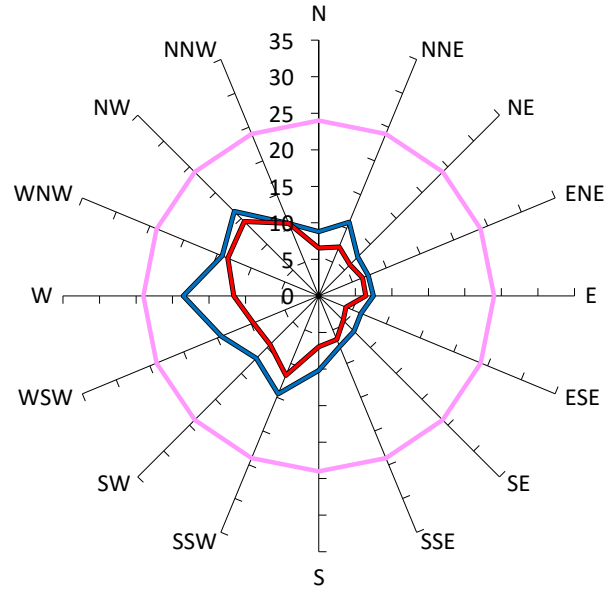
Results for Point 20

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

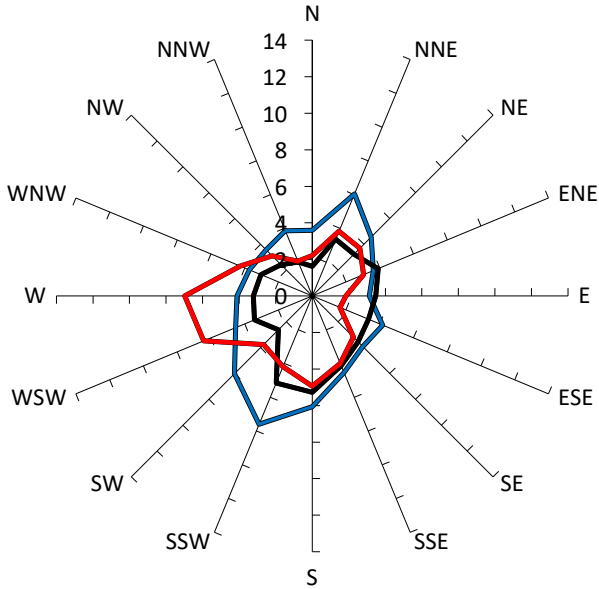
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	1%	19
With inclusion of Existing and Retained Trees	0%	14

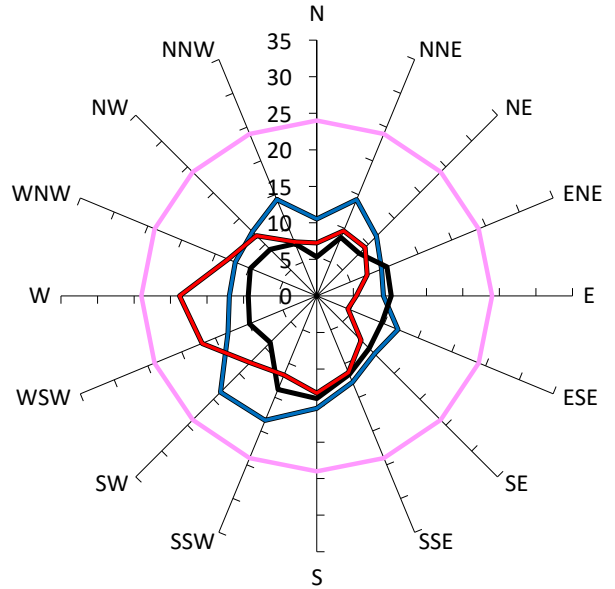
Results for Point 21

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

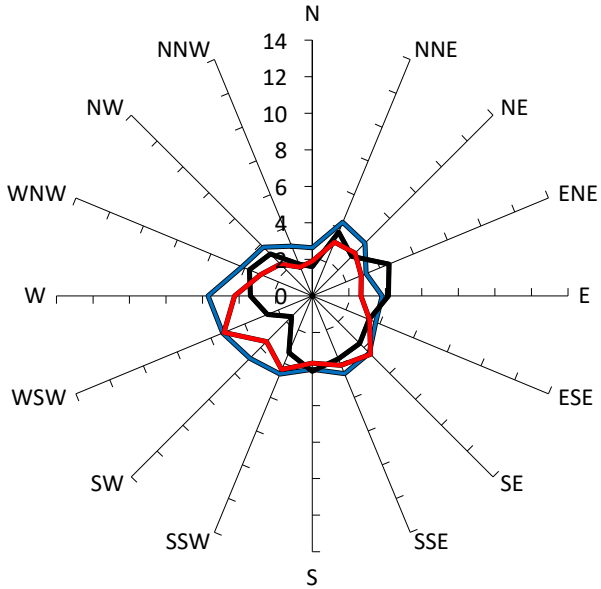
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	2%	19
—	Existing Site	0%	14
—	With inclusion of Existing and Retained Trees	1%	19
—			
—			
—			
—			
—			

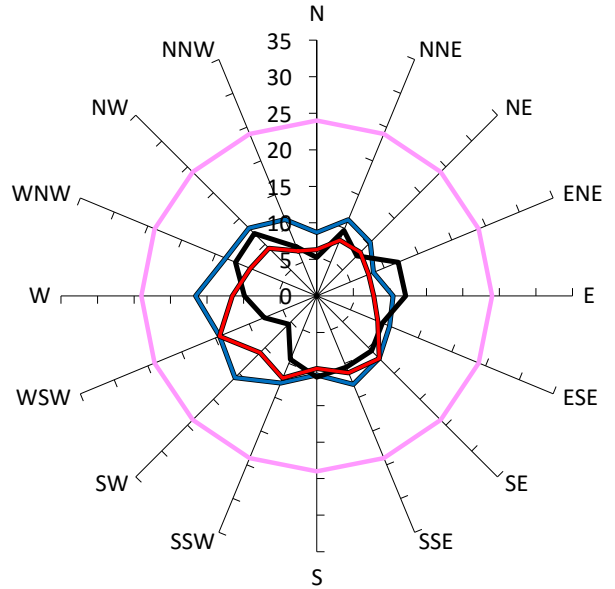
Results for Point 22

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

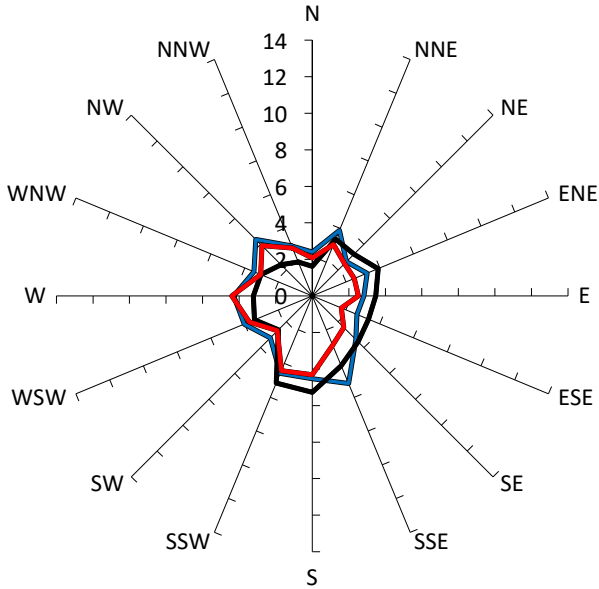
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	0%	17
Existing Site	0%	12
With inclusion of Existing and Retained Trees	0%	14

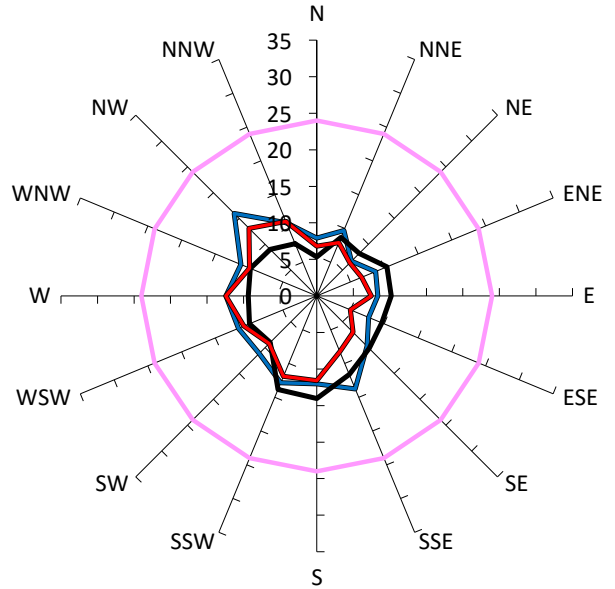
Results for Point 23

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

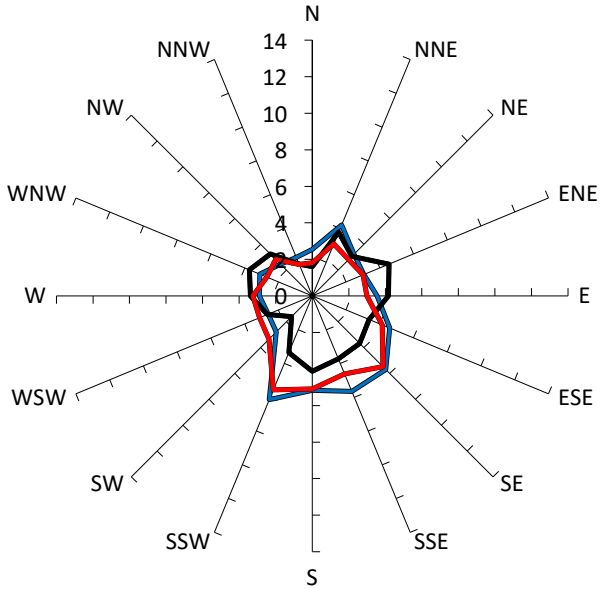
GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
— With development as proposed, no vegetation	0%	16
— Existing Site	0%	14
— With inclusion of Existing and Retained Trees	0%	13
—		
—		
—		
—		
—		

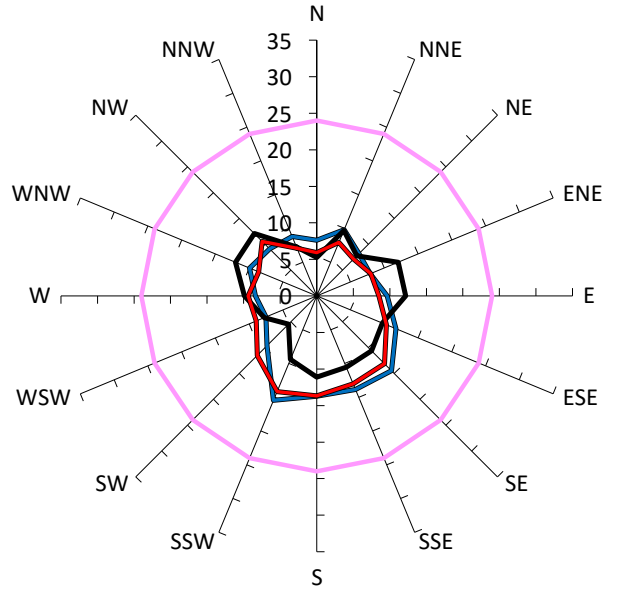
Results for Point 24

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

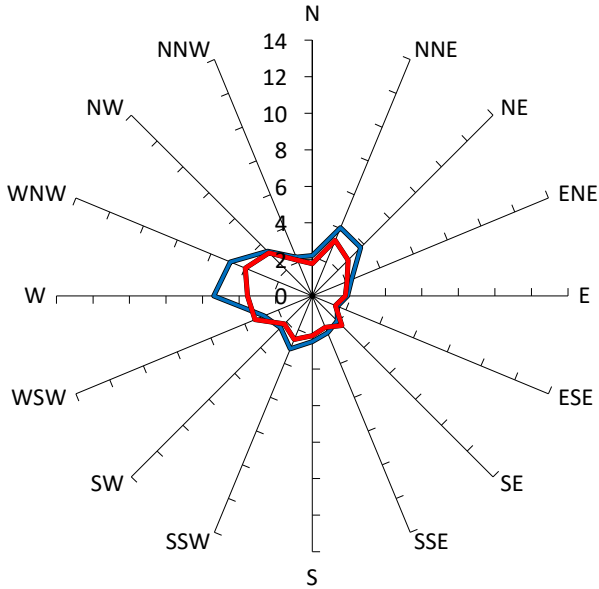
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	0%	15
Existing Site	0%	12
With inclusion of Existing and Retained Trees	0%	14

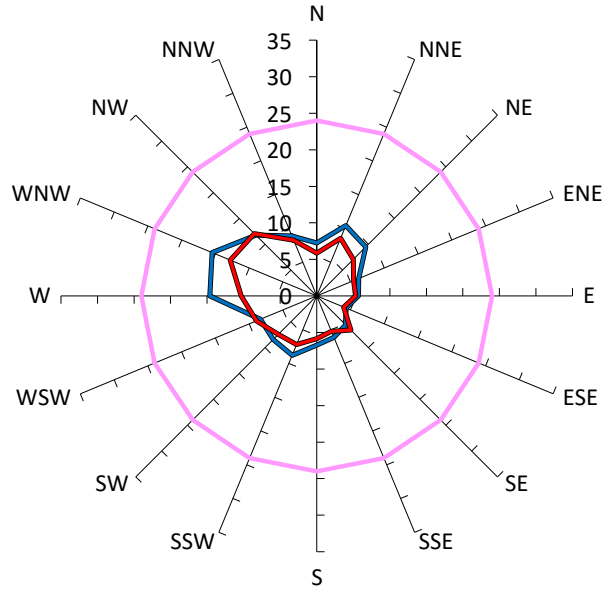
Results for Point 25

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

0%

15

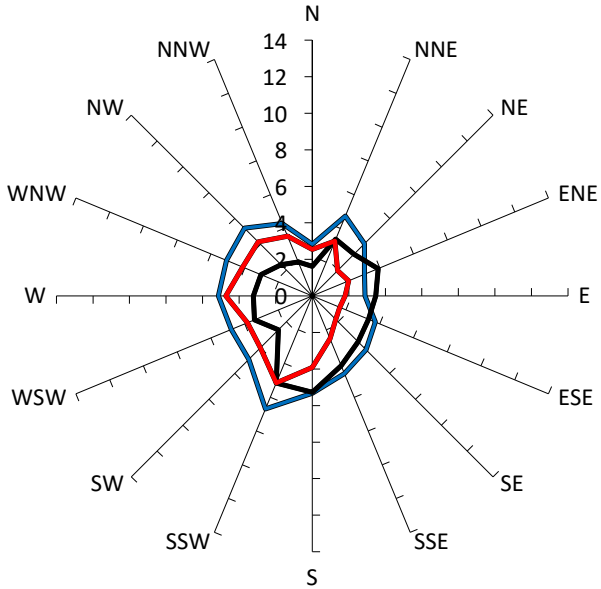
— With inclusion of Existing and Retained Trees

0%

13

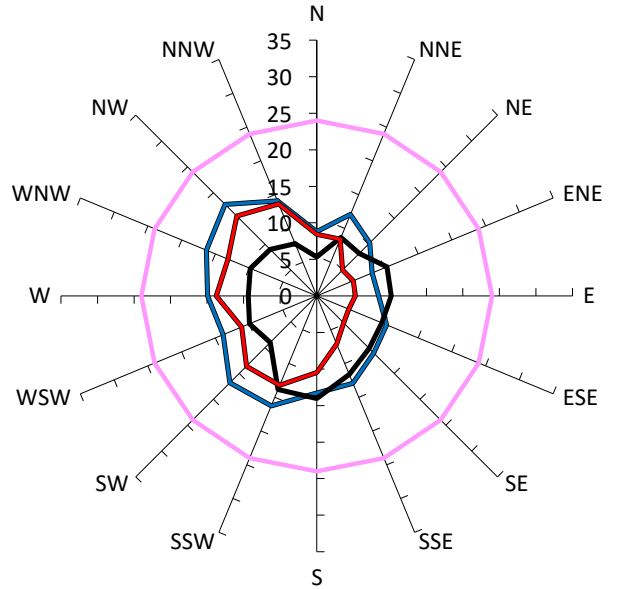
Results for Point 26

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

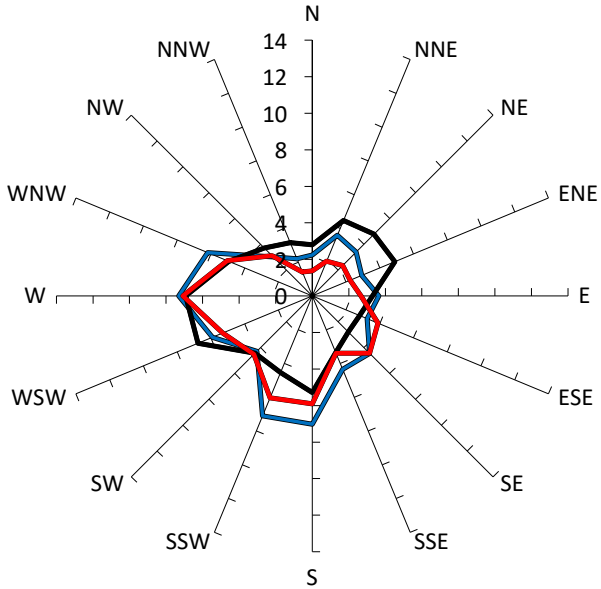
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	18
—	Existing Site	0%	14
—	With inclusion of Existing and Retained Trees	0%	15
—			
—			
—			
—			
—			

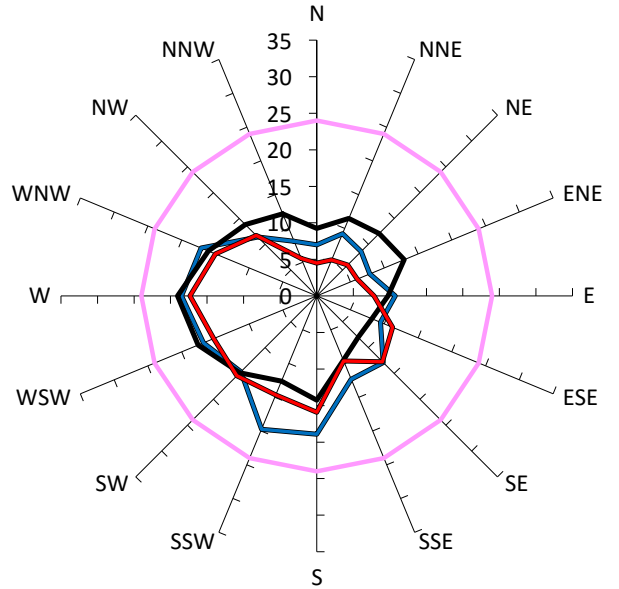
Results for Point 27

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

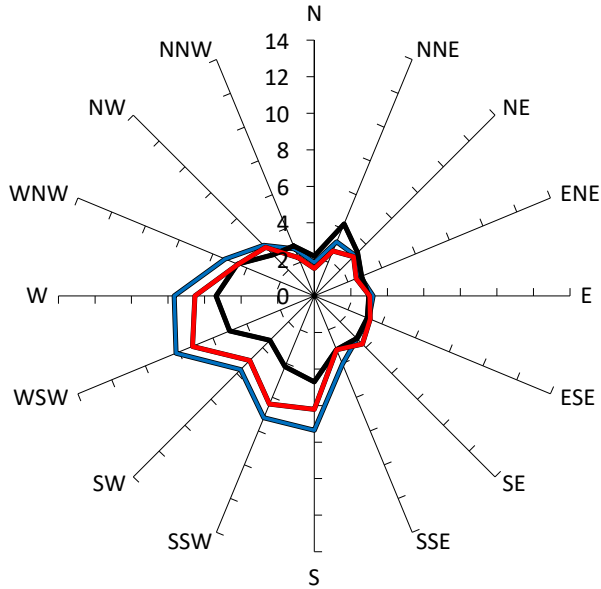
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	2%	20
Existing Site	1%	19
With inclusion of Existing and Retained Trees	1%	17

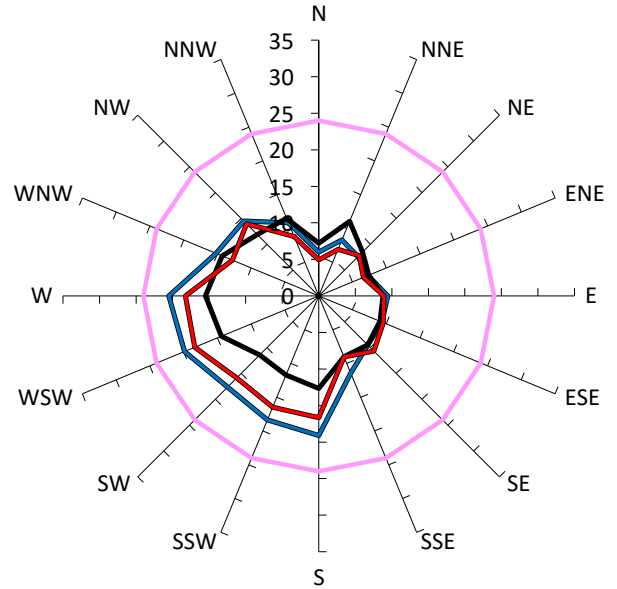
Results for Point 28

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

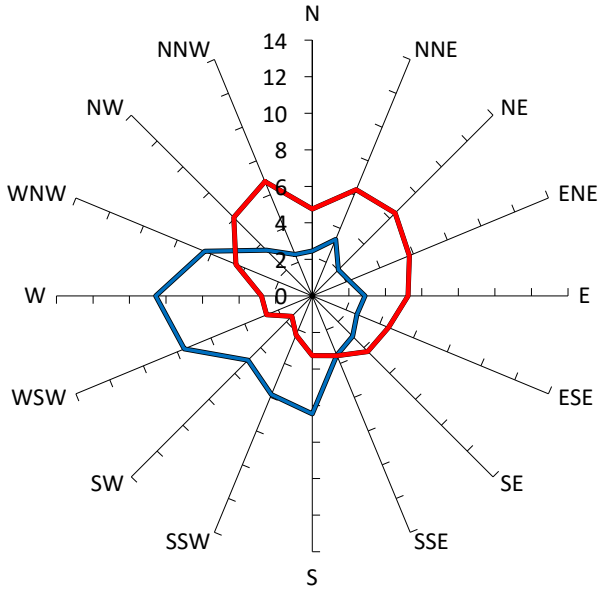
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	4%	21
—	Existing Site	0%	15
—	With inclusion of Existing and Retained Trees	2%	18
—			
—			
—			
—			
—			

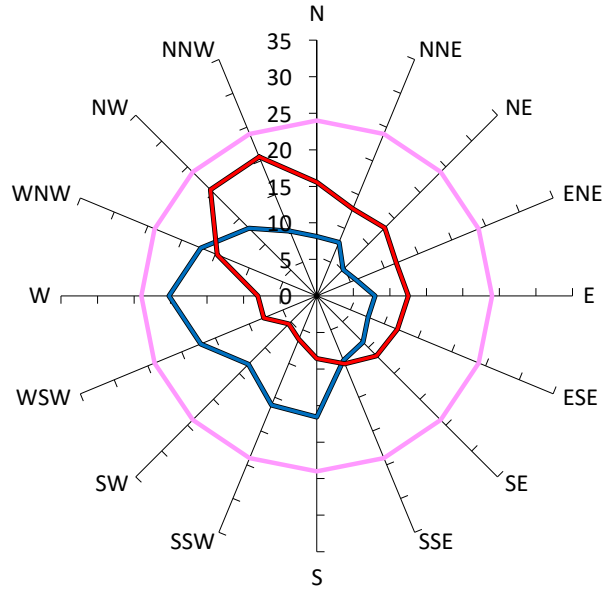
Results for Point 29

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

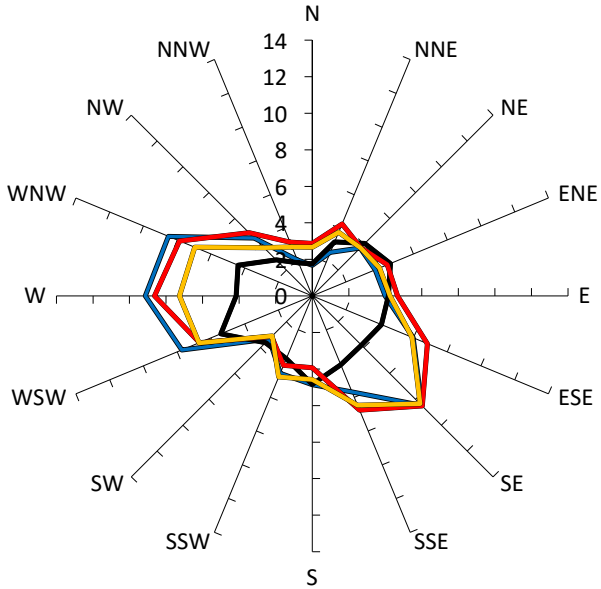
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	3%	20
—			
—	With inclusion of Existing and Retained Trees	2%	21
—			
—			
—			
—			
—			

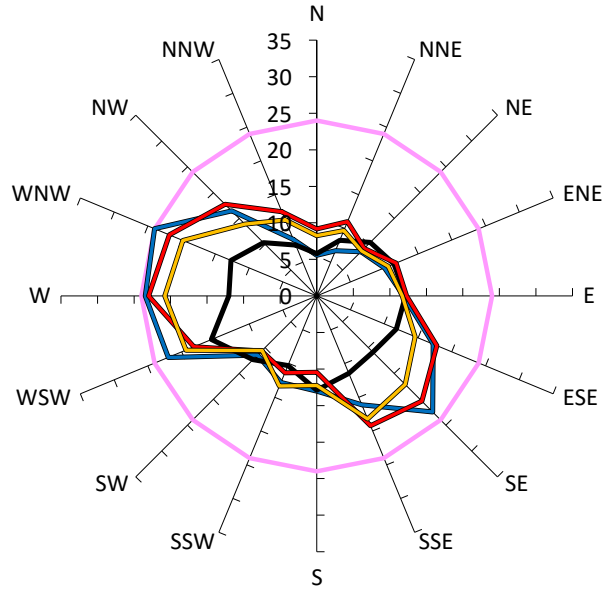
Results for Point 30

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

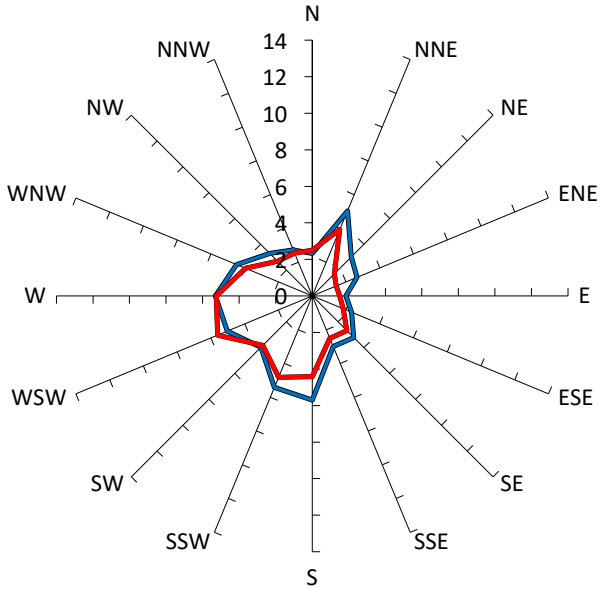
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	6%	24
—	Existing Site	0%	16
—	With inclusion of Existing and Retained Trees	6%	23
—	Awning along Western and Southern façade of LOT Q	4%	21
—			
—			
—			
—			

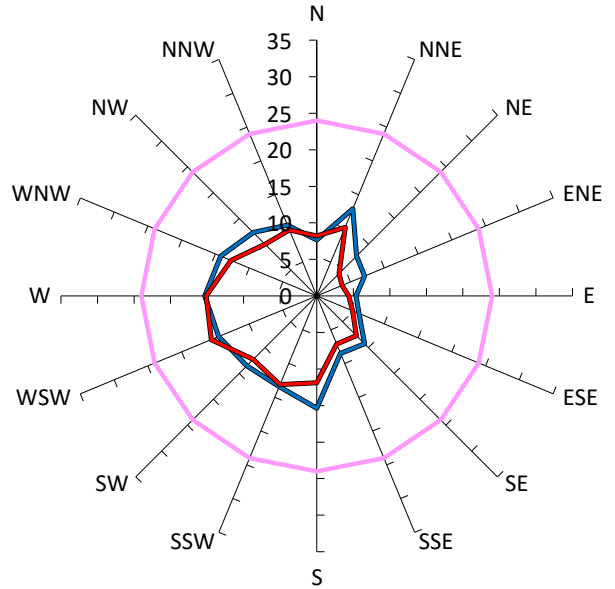
Results for Point 31

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

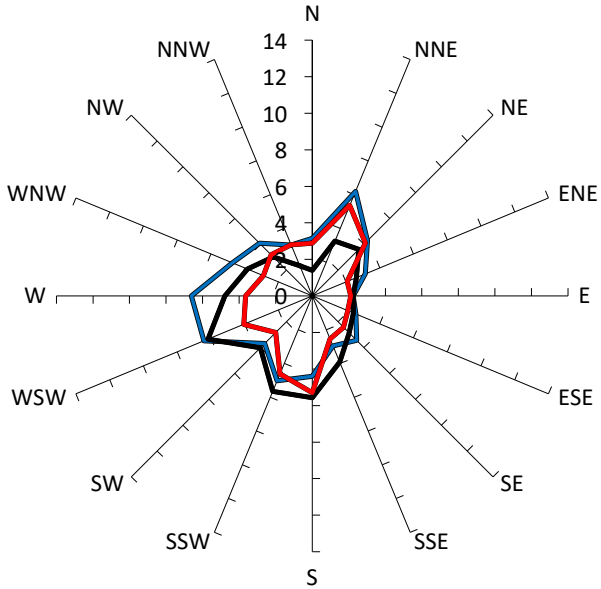
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	0%	15
—			
—	With inclusion of Existing and Retained Trees	0%	16
—			
—			
—			
—			
—			

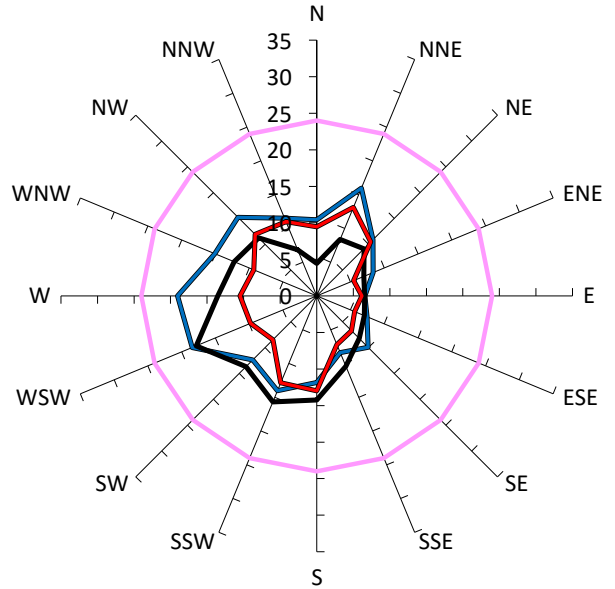
Results for Point 32

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

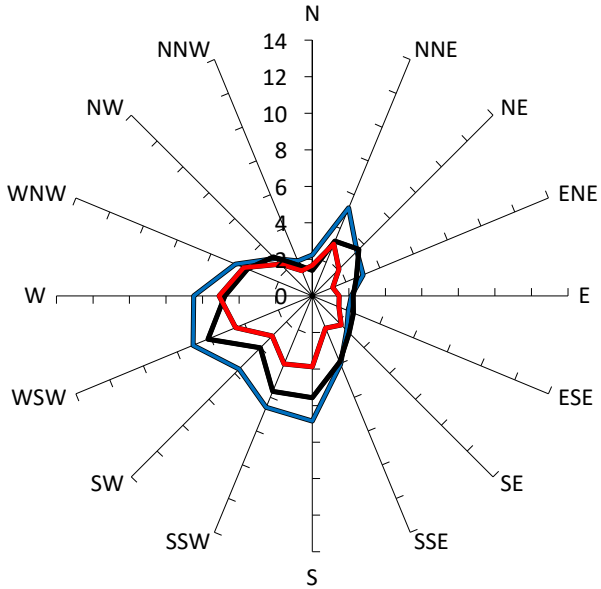
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	19
—	Existing Site	0%	18
—	With inclusion of Existing and Retained Trees	0%	13
—			
—			
—			
—			
—			

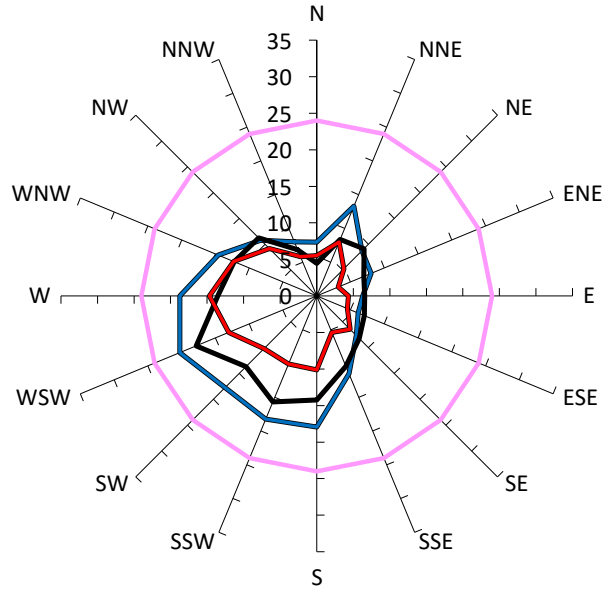
Results for Point 33

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

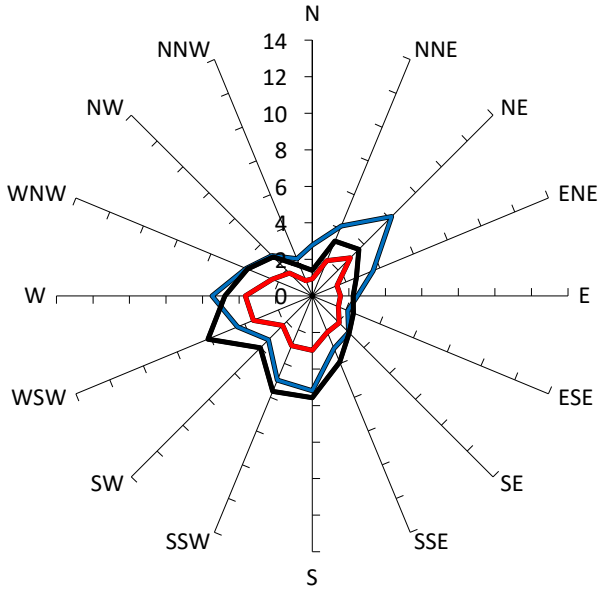
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	2%	20
—	Existing Site	0%	18
—	With inclusion of Existing and Retained Trees	0%	15
—			
—			
—			
—			
—			

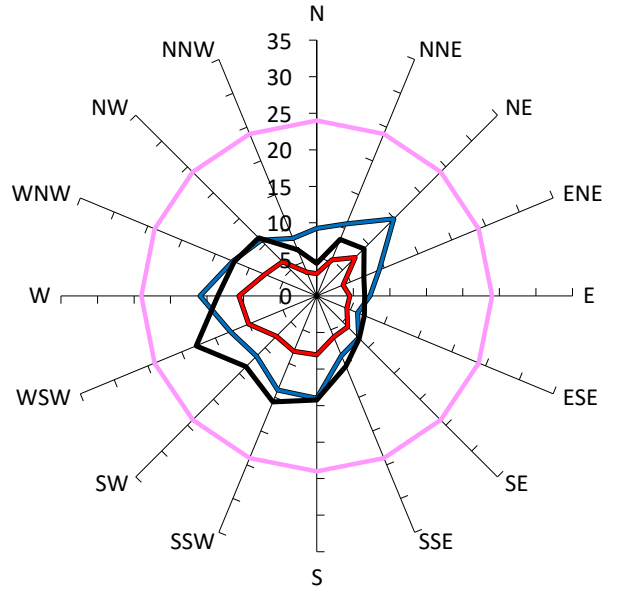
Results for Point 34

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

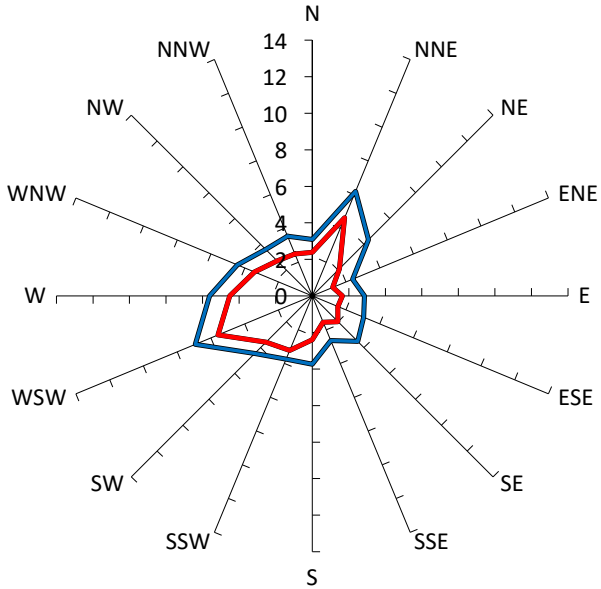
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	0%	16
—	Existing Site	0%	18
—	With inclusion of Existing and Retained Trees	0%	11
—			
—			
—			
—			
—			

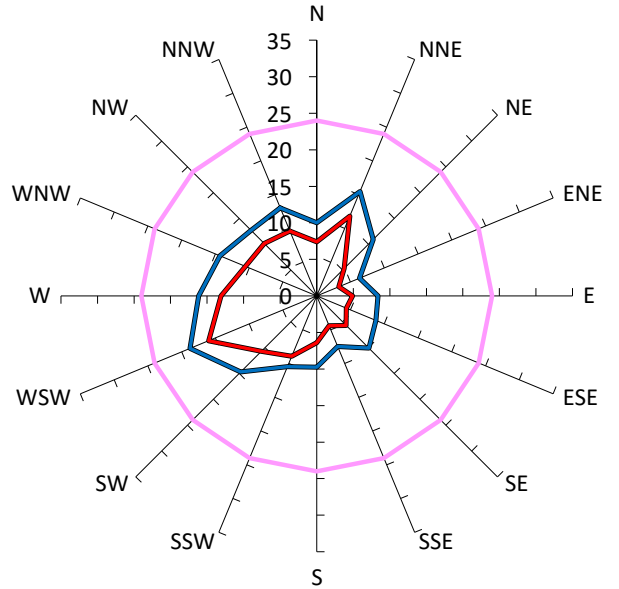
Results for Point 35

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

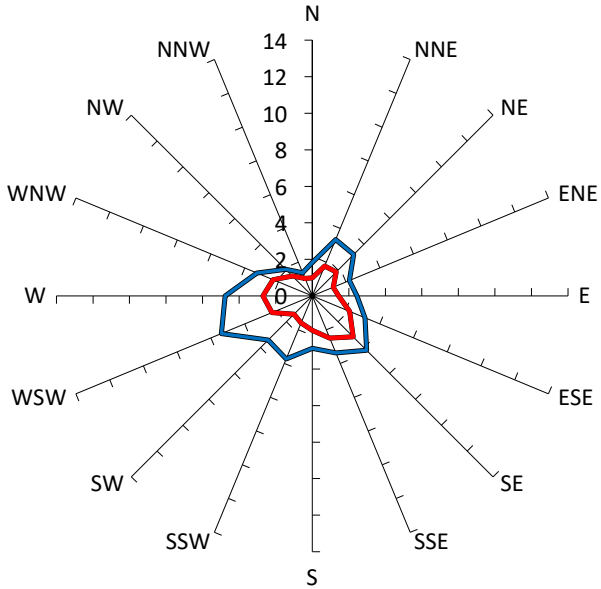
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	1%	19
With inclusion of Existing and Retained Trees	0%	16

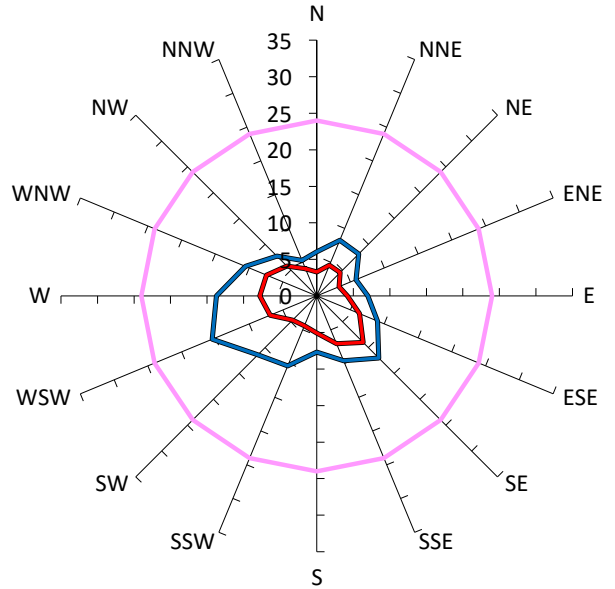
Results for Point 36

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

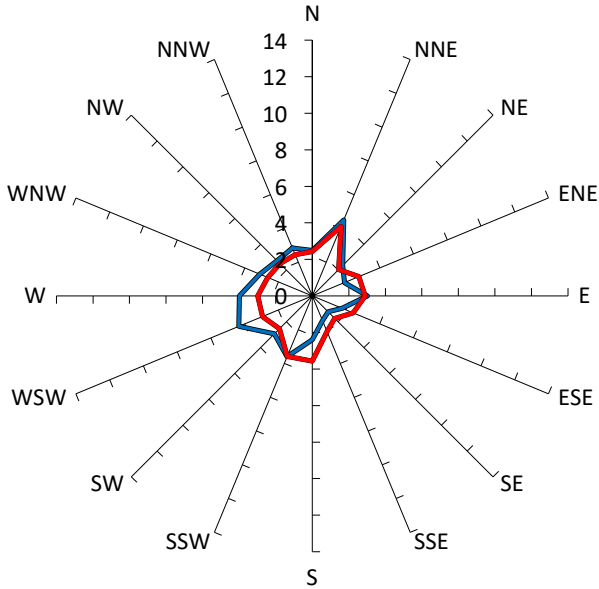
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	0%	15
—			
—	With inclusion of Existing and Retained Trees	0%	9
—			
—			
—			
—			
—			

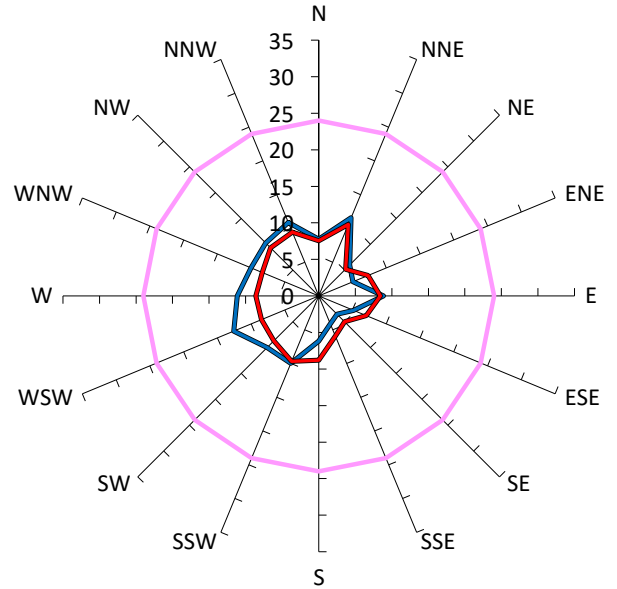
Results for Point 37

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

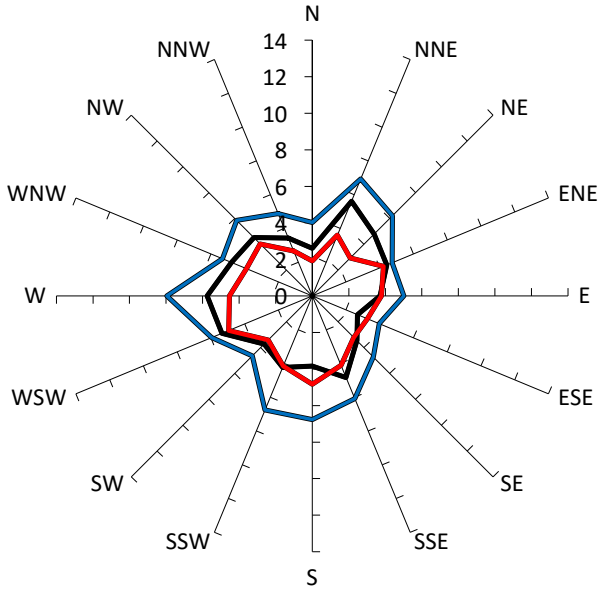
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	0%	13
With inclusion of Existing and Retained Trees	0%	11

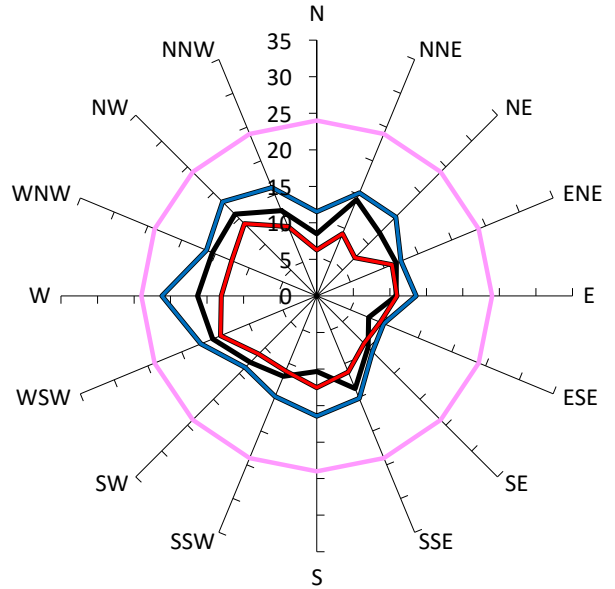
Results for Point 38

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

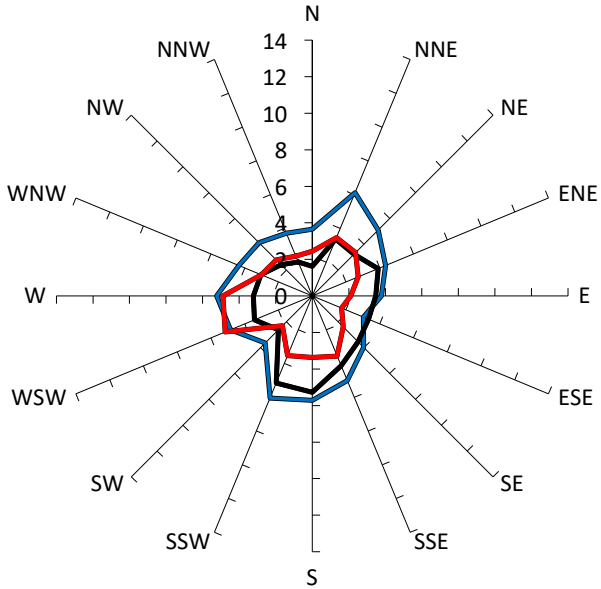
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	4%	21
Existing Site	1%	16
With inclusion of Existing and Retained Trees	0%	14

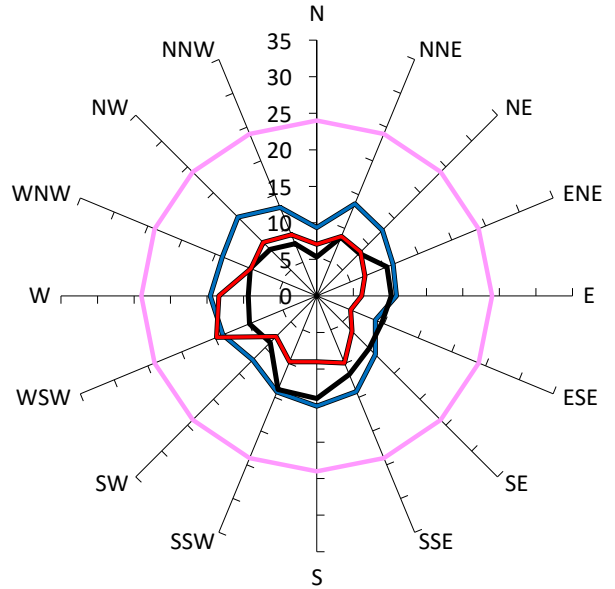
Results for Point 39

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

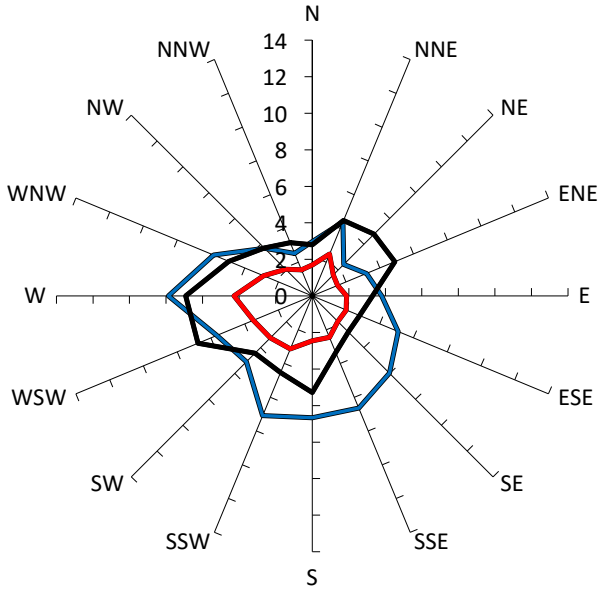
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	15
—	Existing Site	0%	14
—	With inclusion of Existing and Retained Trees	0%	15
—			
—			
—			
—			
—			

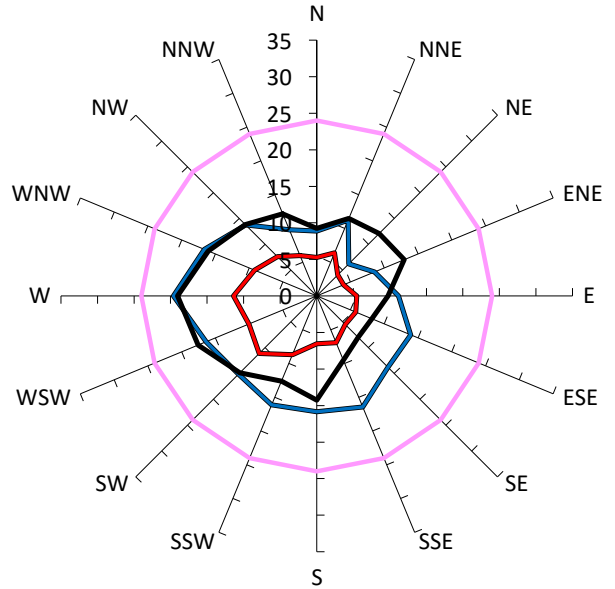
Results for Point 40

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

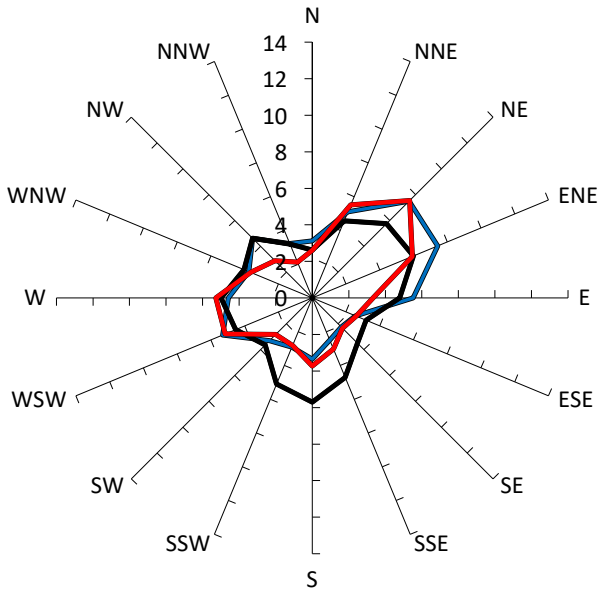
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	3%	20
—	Existing Site	1%	19
—	With inclusion of Existing and Retained Trees	0%	11
—			
—			
—			
—			
—			

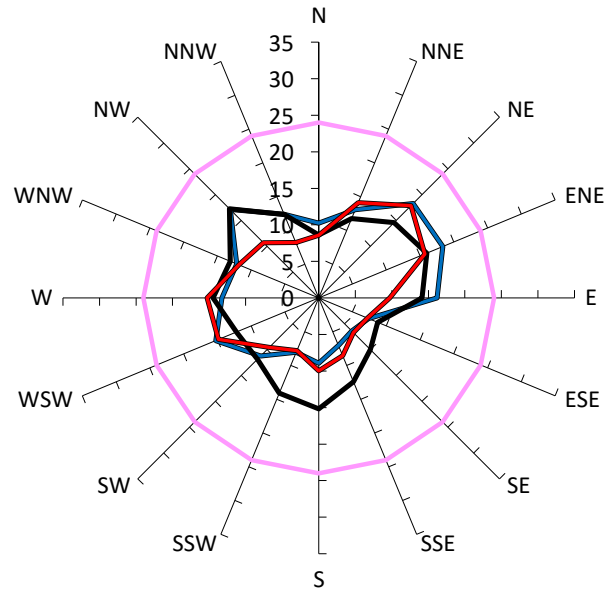
Results for Point 41

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

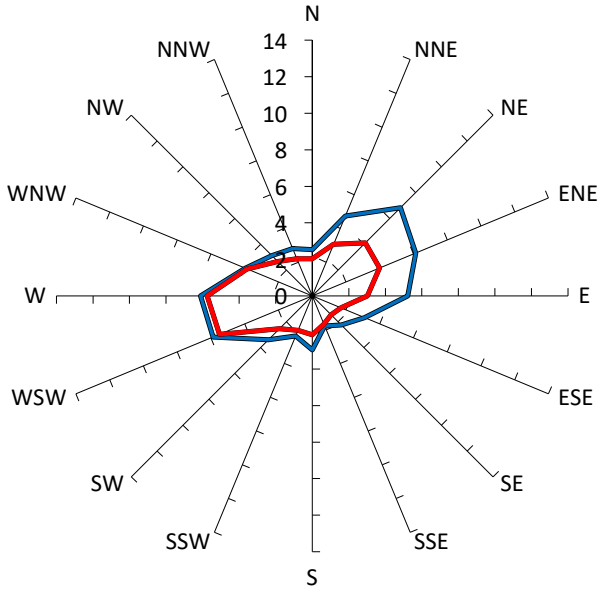
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	2%	18
—	Existing Site	1%	17
—	With inclusion of Existing and Retained Trees	1%	18
—			
—			
—			
—			
—			

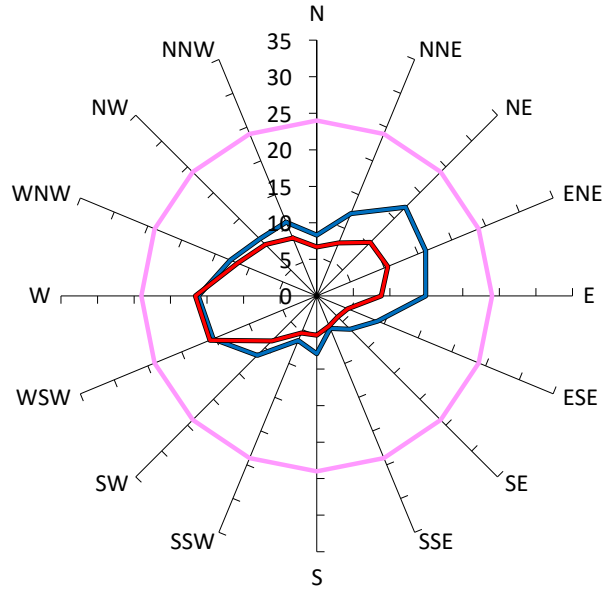
Results for Point 42

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

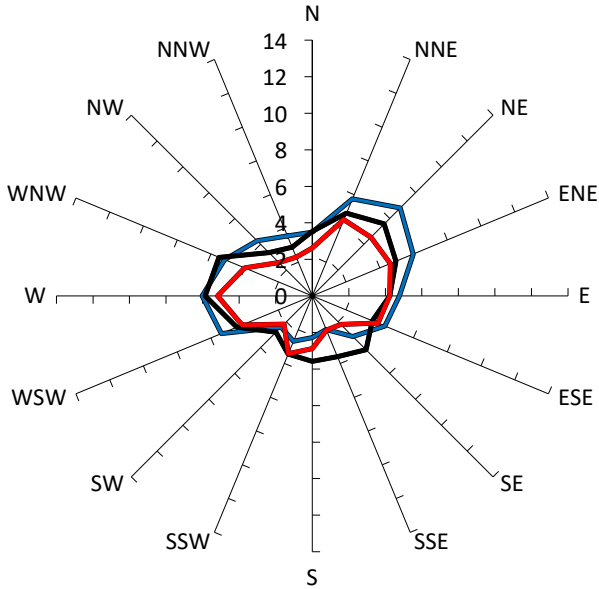
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	1%	17
With inclusion of Existing and Retained Trees	0%	17

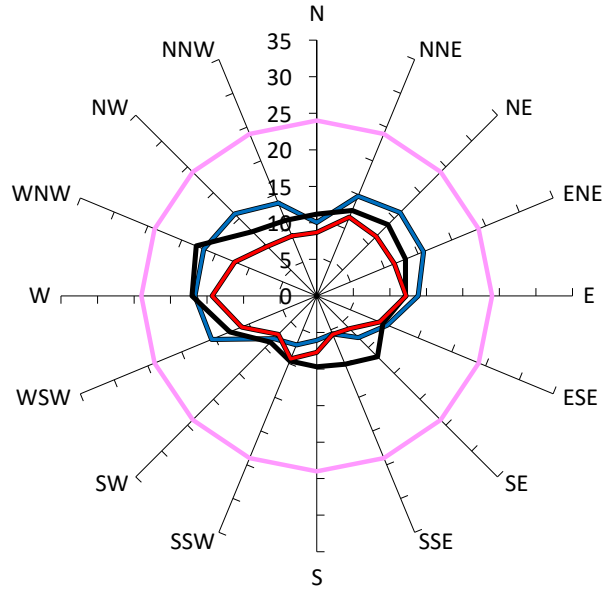
Results for Point 43

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

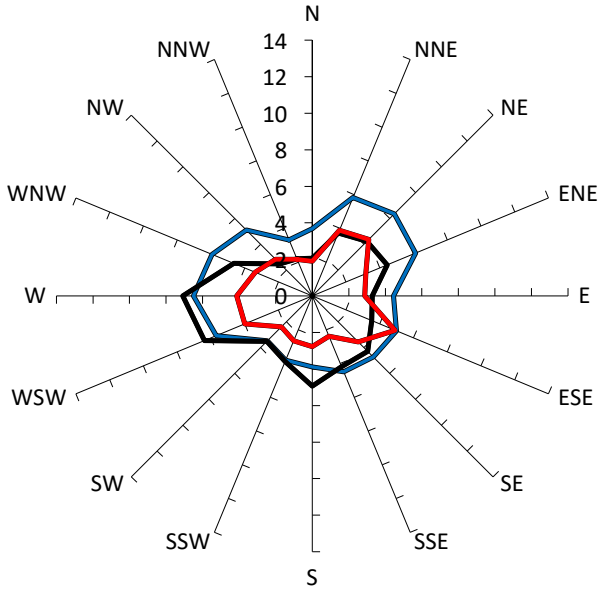
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	17
—	Existing Site	0%	18
—	With inclusion of Existing and Retained Trees	0%	14
—			
—			
—			
—			
—			

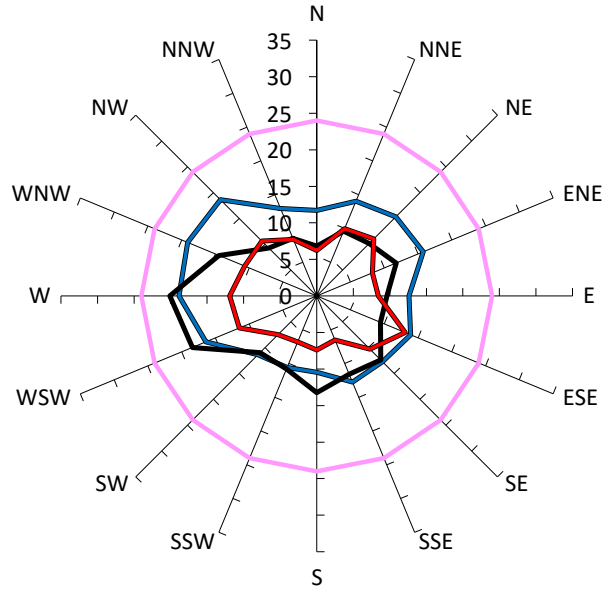
Results for Point 44

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

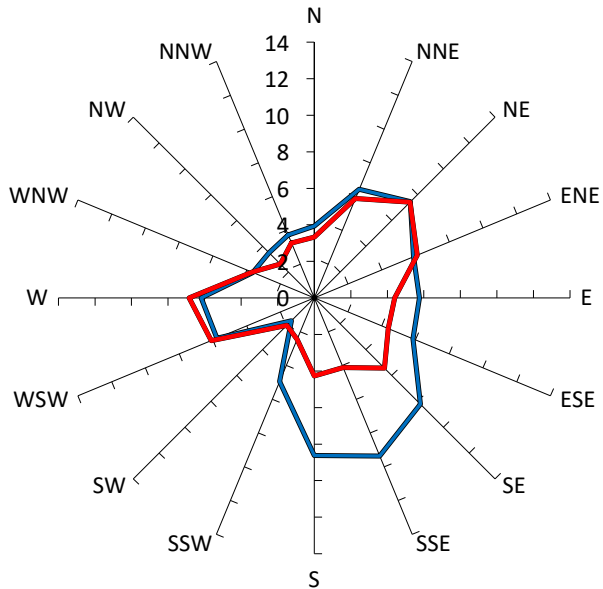
GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
— With development as proposed, no vegetation	1%	19
— Existing Site	1%	20
— With inclusion of Existing and Retained Trees	0%	13
—		
—		
—		
—		
—		

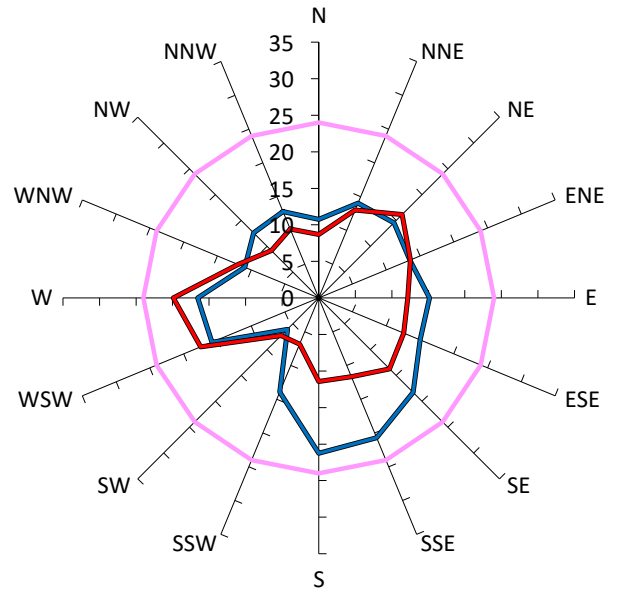
Results for Point 45

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

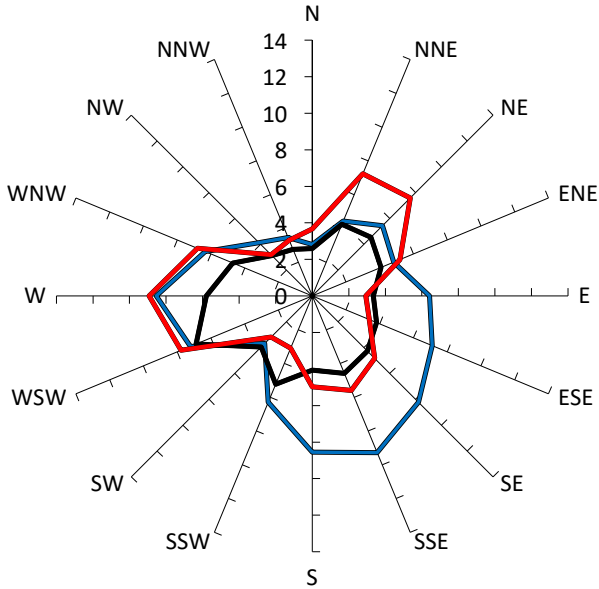
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	9%	21
With inclusion of Existing and Retained Trees	2%	20

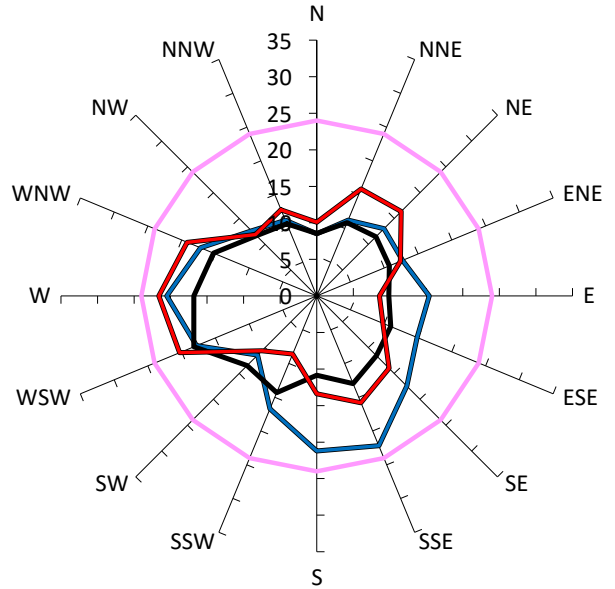
Results for Point 46

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

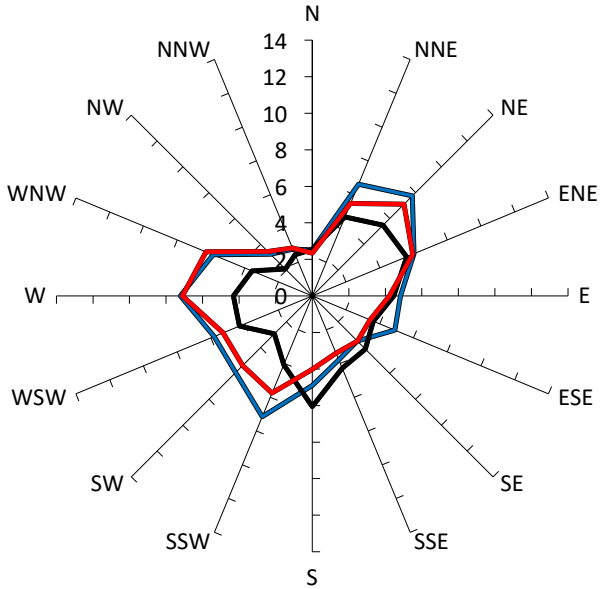
GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
— With development as proposed, no vegetation	11%	22
— Existing Site	1%	18
— With inclusion of Existing and Retained Trees	5%	22
—		
—		
—		
—		
—		

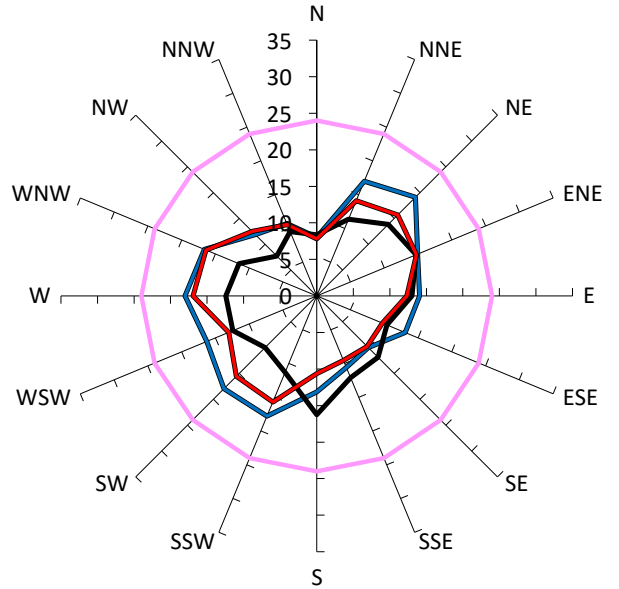
Results for Point 47

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

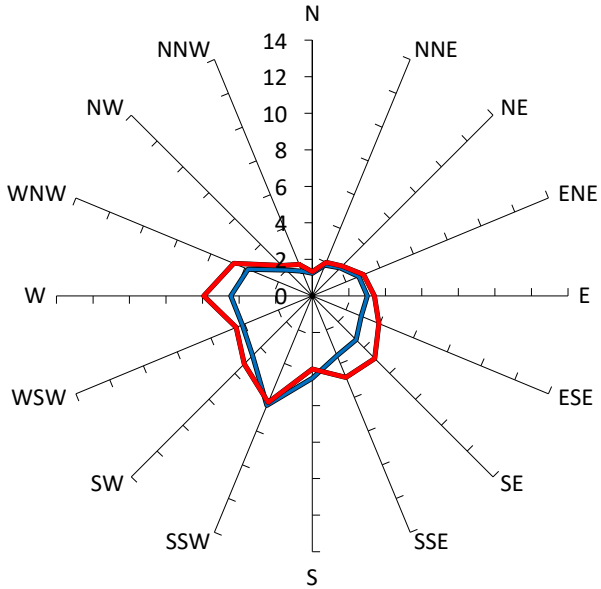
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	3%	19
—	Existing Site	0%	16
—	With inclusion of Existing and Retained Trees	2%	17
—			
—			
—			
—			
—			

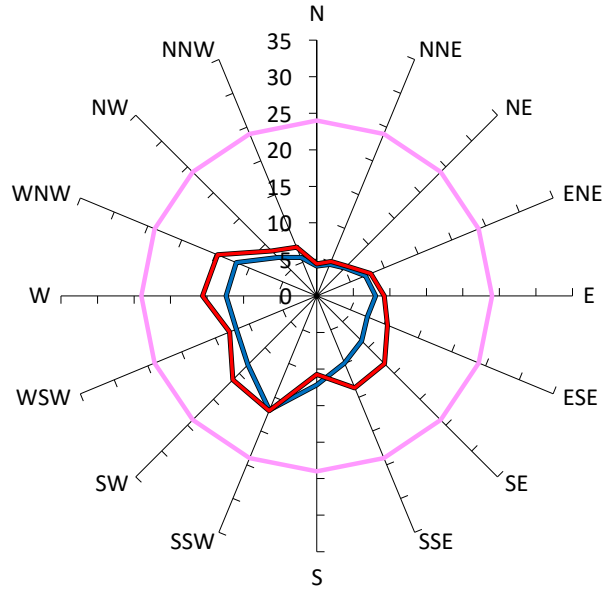
Results for Point 48

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

0%

17

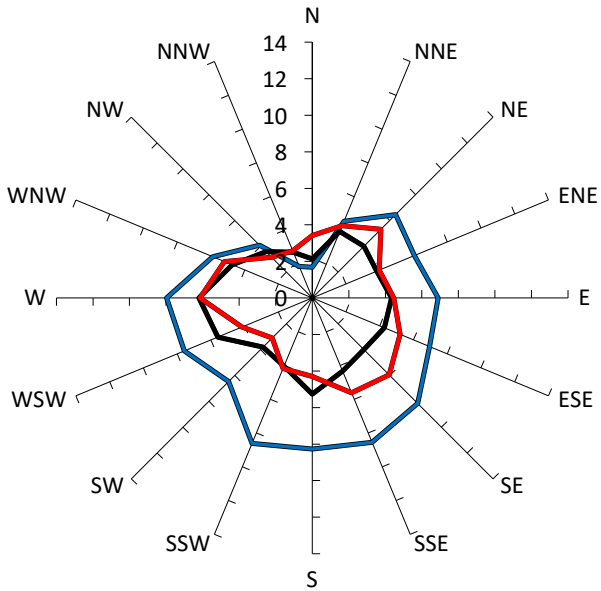
— With inclusion of Existing and Retained Trees

1%

17

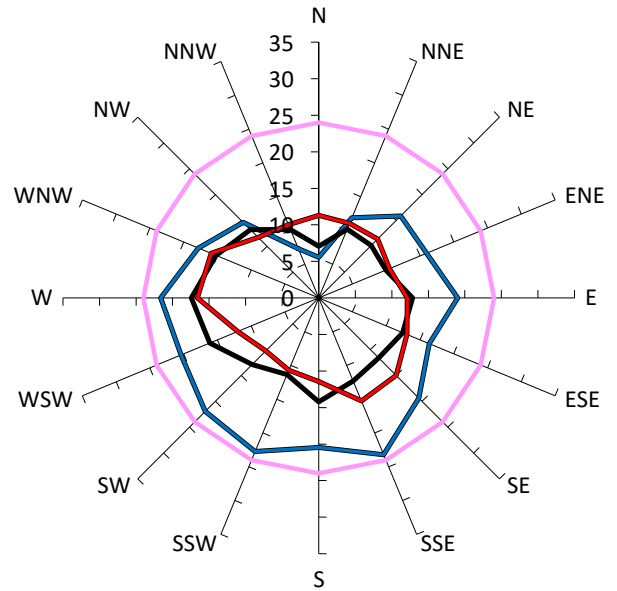
Results for Point 49

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

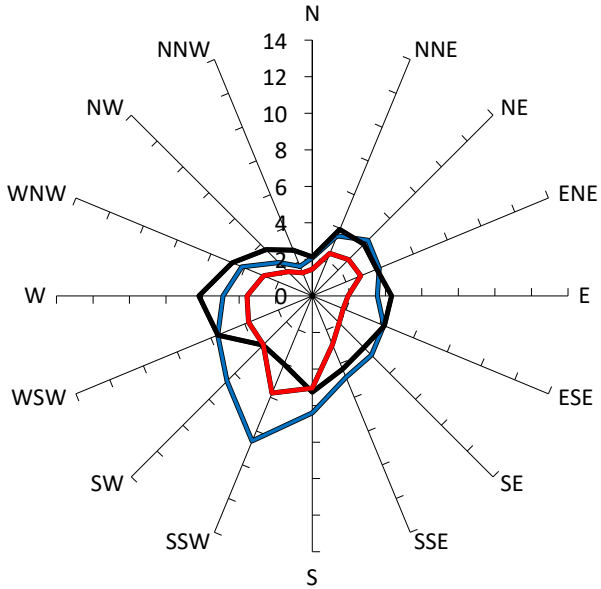
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	11%	23
—	Existing Site	1%	17
—	With inclusion of Existing and Retained Trees	1%	17
—			
—			
—			
—			
—			

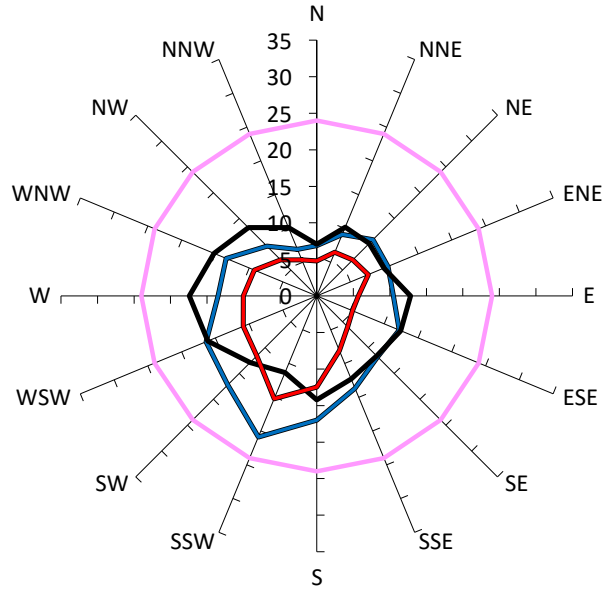
Results for Point 50

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

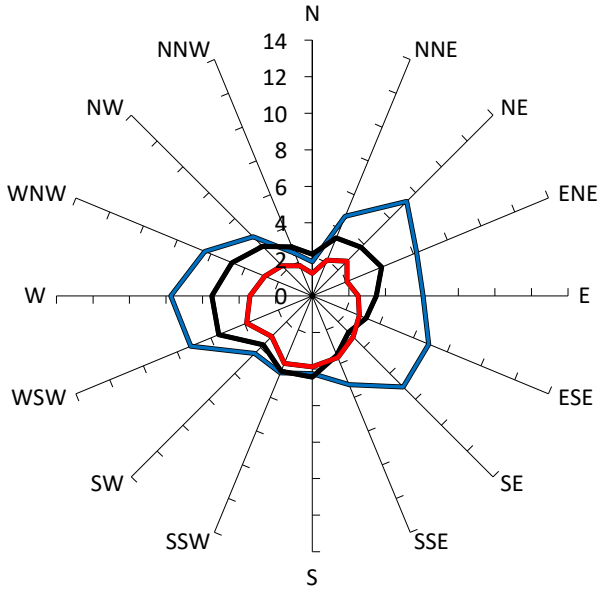
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	3%	21
—	Existing Site	1%	17
—	With inclusion of Existing and Retained Trees	0%	15
—			
—			
—			
—			
—			

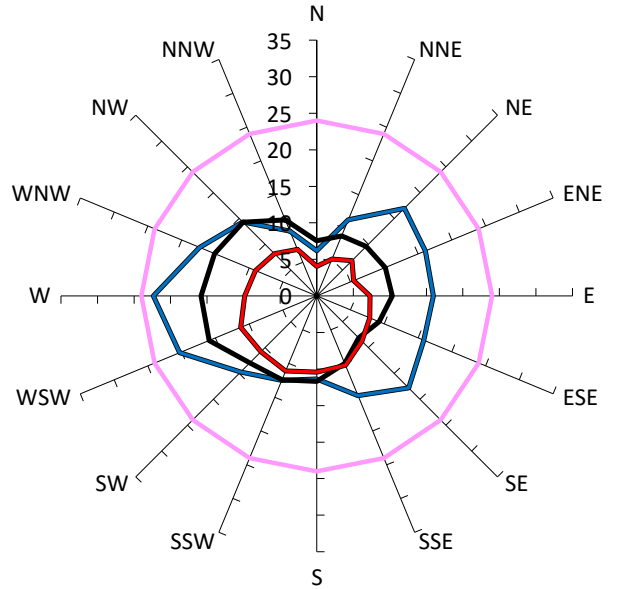
Results for Point 51

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

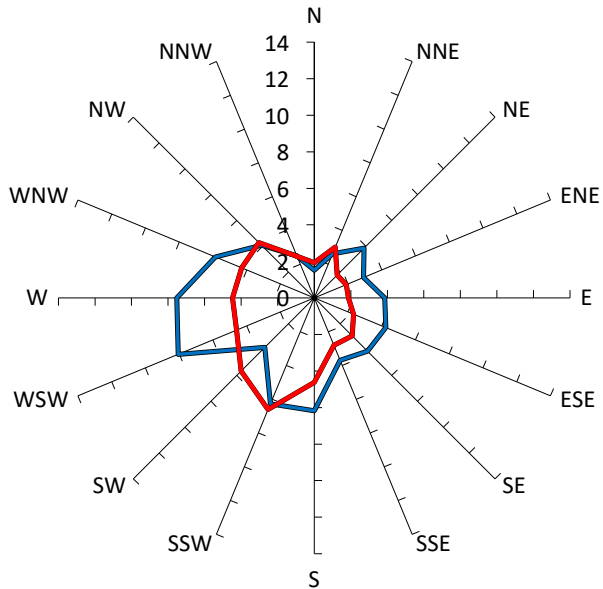
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	4%	22
—	Existing Site	0%	16
—	With inclusion of Existing and Retained Trees	0%	11
—			
—			
—			
—			
—			

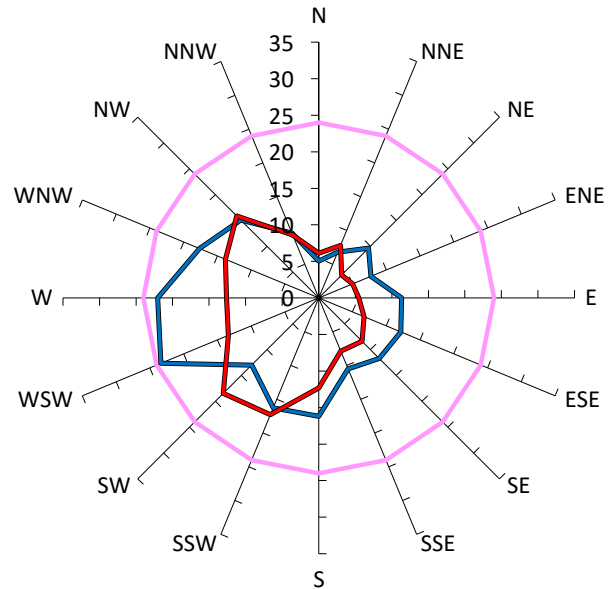
Results for Point 52

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

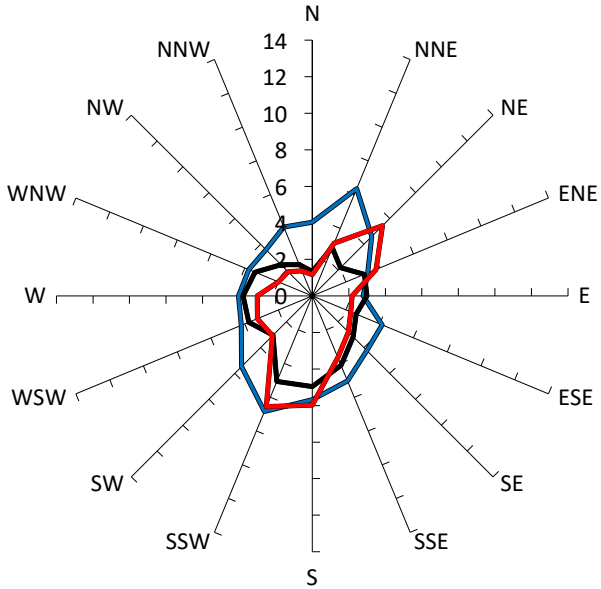
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	3%	23
With inclusion of Existing and Retained Trees	1%	18

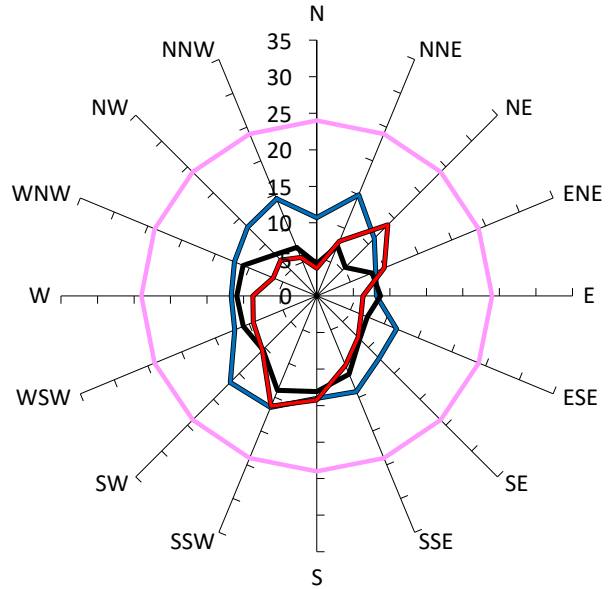
Results for Point 53

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

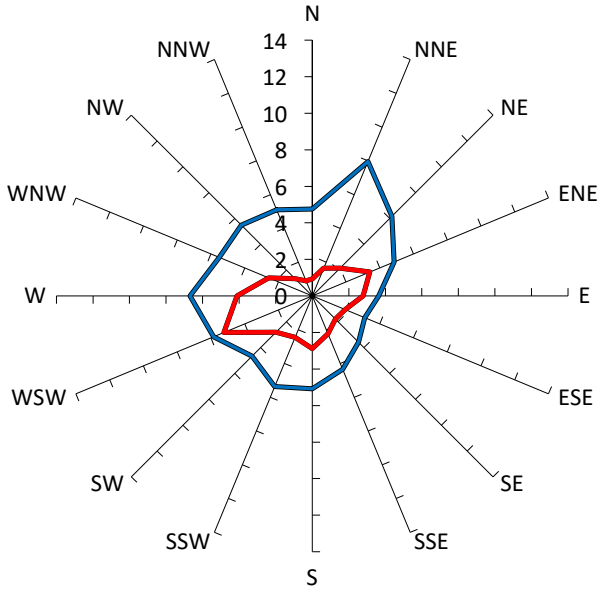
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	17
—	Existing Site	0%	14
—	With inclusion of Existing and Retained Trees	0%	16
—			
—			
—			
—			
—			

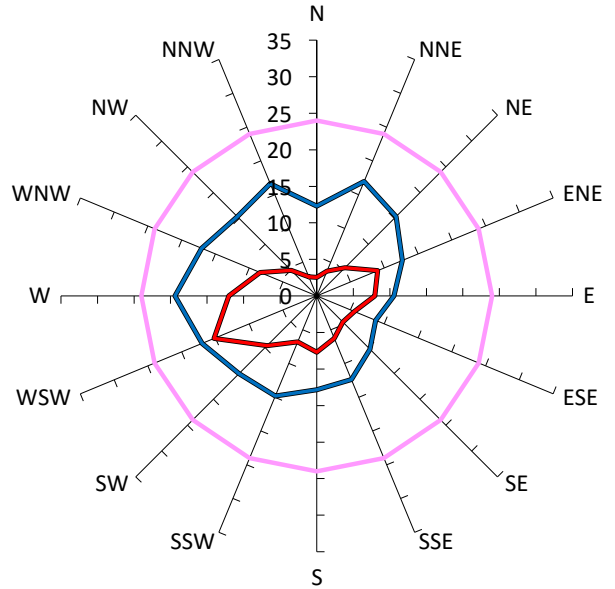
Results for Point 54

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

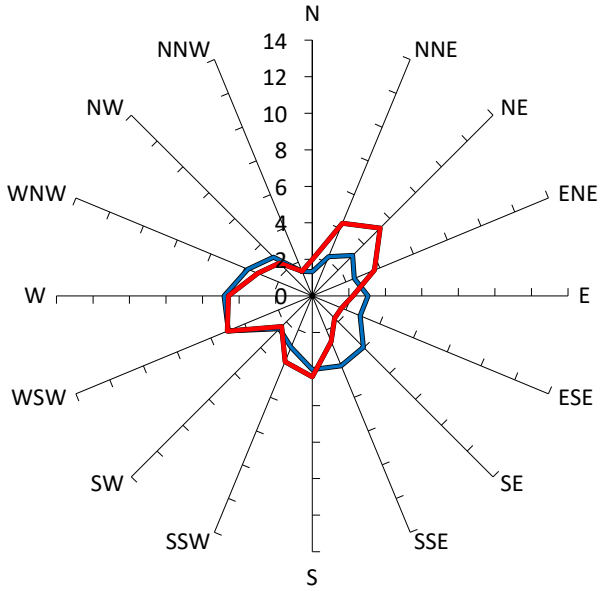
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	3%	19
—	With inclusion of Existing and Retained Trees	0%	15
—			
—			
—			
—			
—			

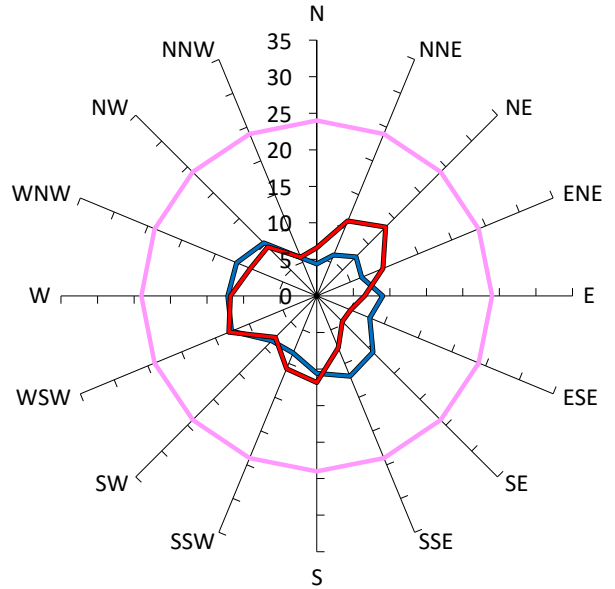
Results for Point 55

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

0%

13

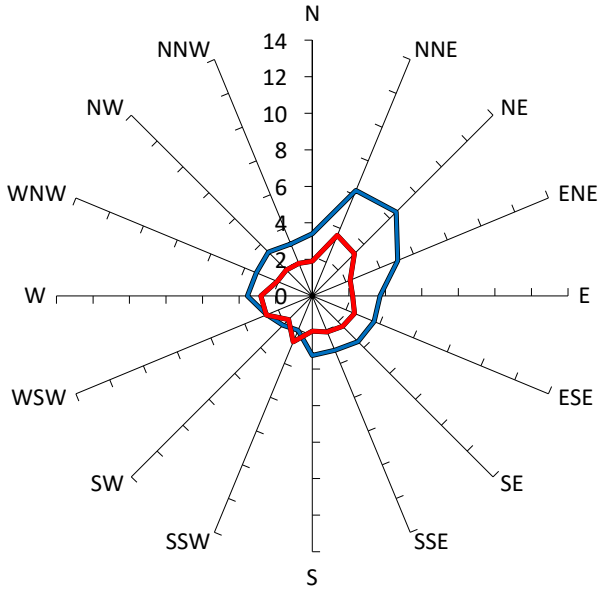
— With inclusion of Existing and Retained Trees

0%

13

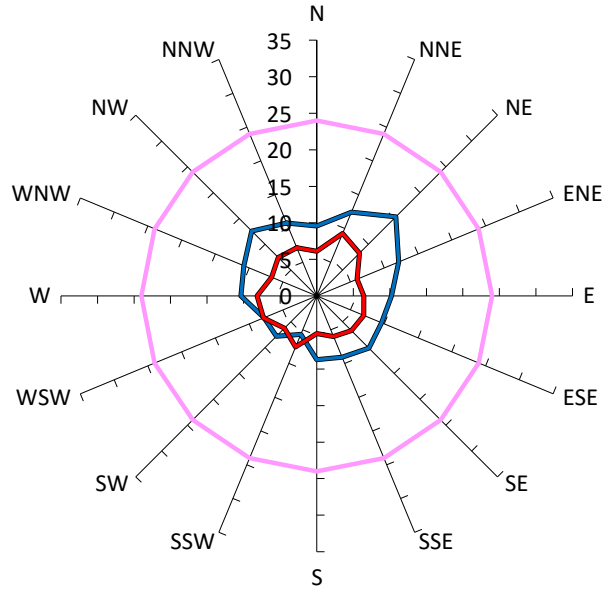
Results for Point 56

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

0%

15

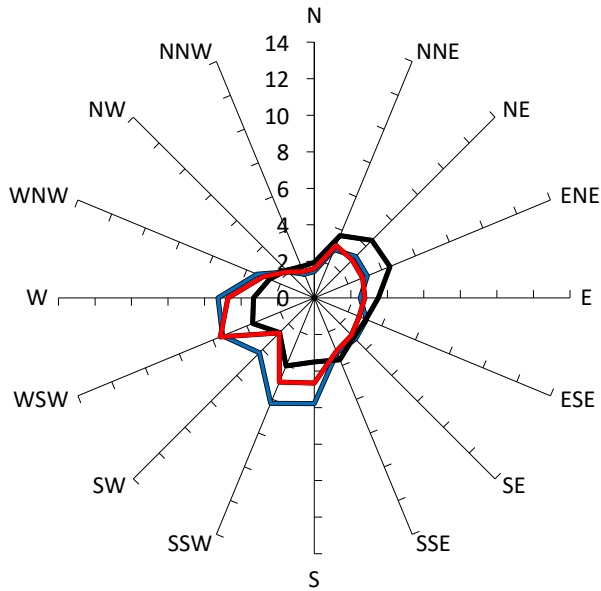
— With inclusion of Existing and Retained Trees

0%

9

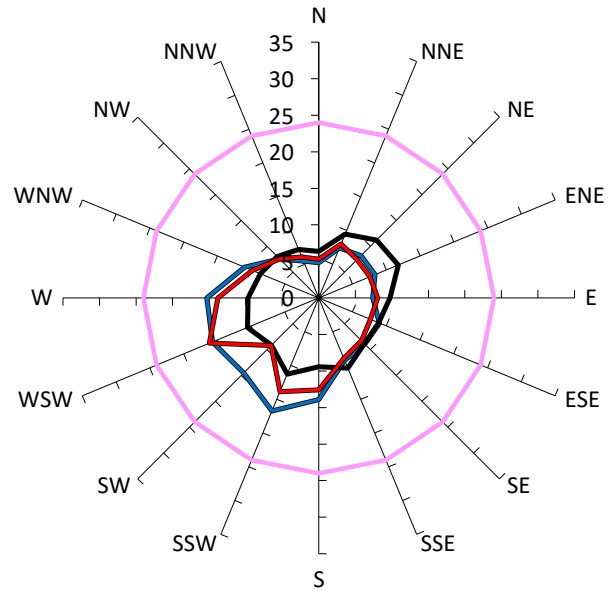
Results for Point 57

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

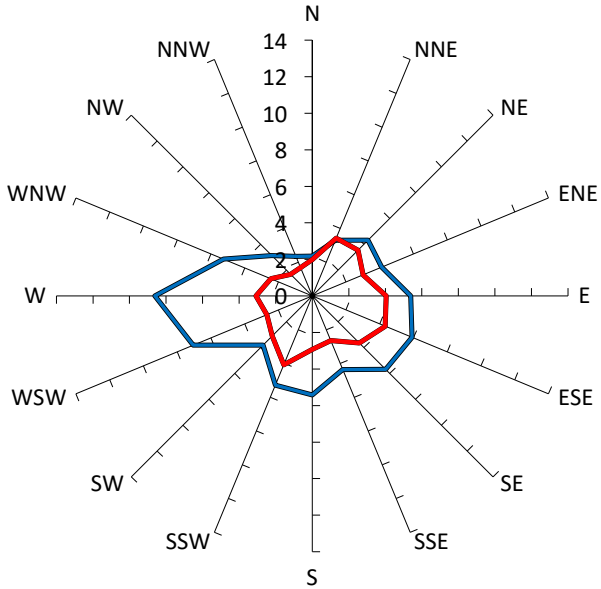
GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
— With development as proposed, no vegetation	1%	17
— Existing Site	0%	12
— With inclusion of Existing and Retained Trees	0%	16
—		
—		
—		
—		
—		

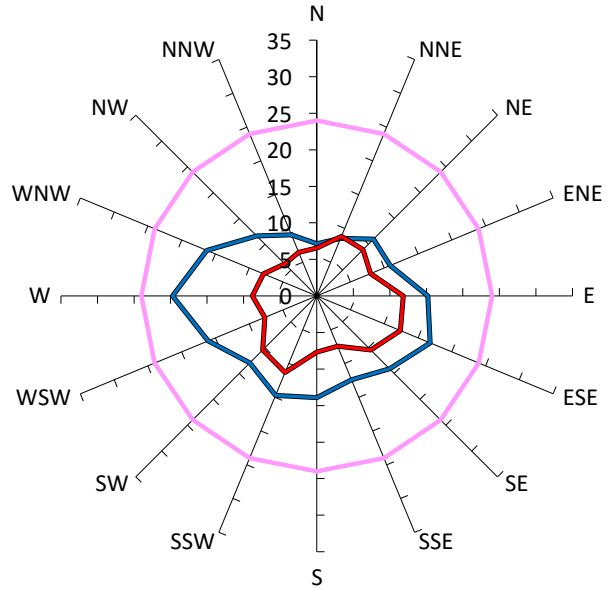
Results for Point 58

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

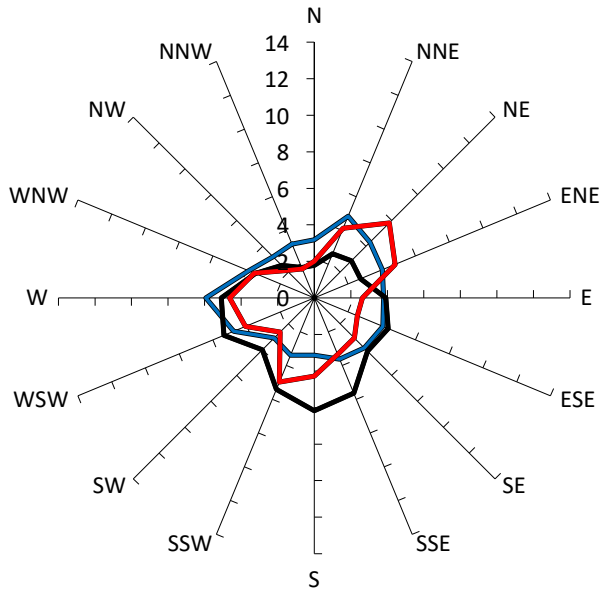
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	3%	20
—	With inclusion of Existing and Retained Trees	0%	12
—			
—			
—			
—			
—			

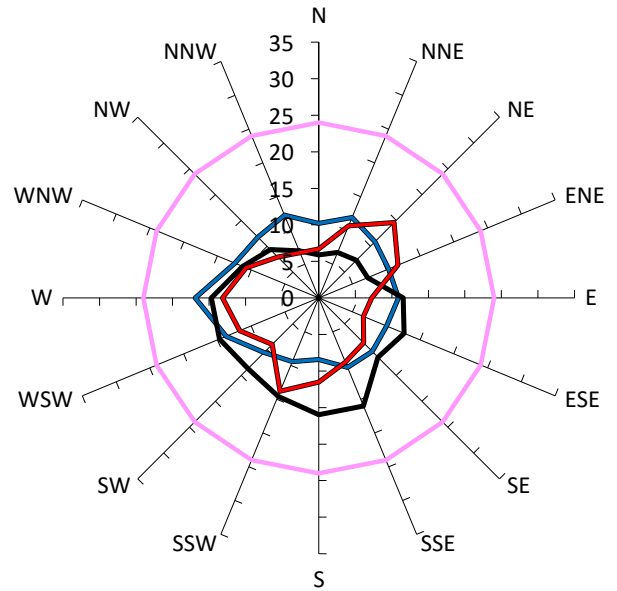
Results for Point 59

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

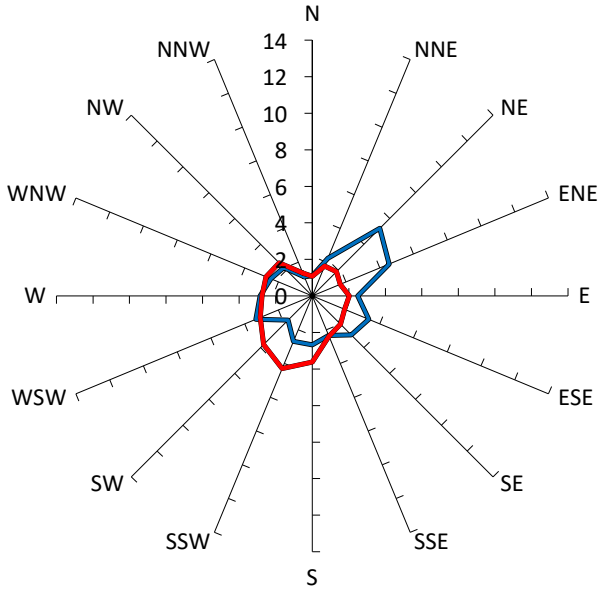
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	0%	17
Existing Site	1%	16
With inclusion of Existing and Retained Trees	0%	15

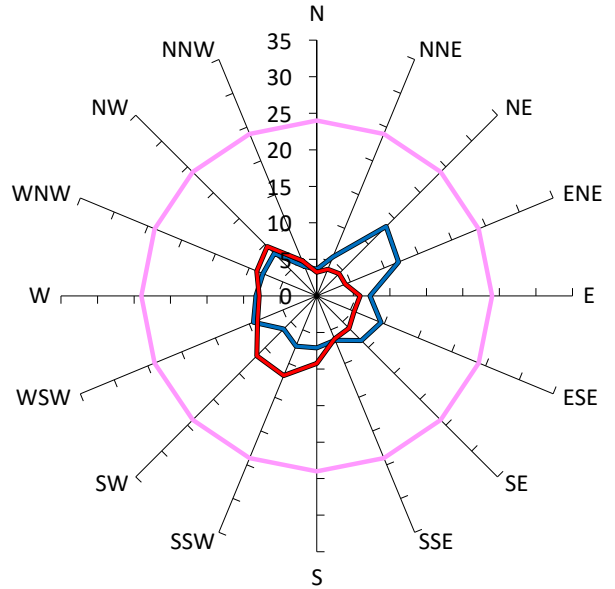
Results for Point 60

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

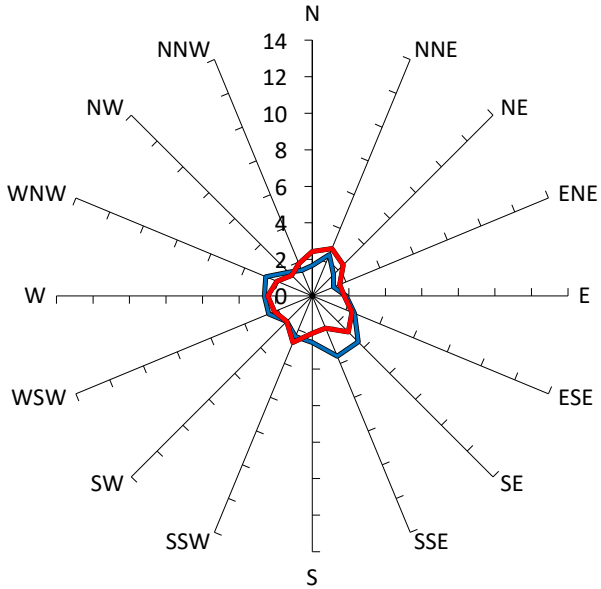
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	0%	13
—			
—	With inclusion of Existing and Retained Trees	0%	12
—			
—			
—			
—			
—			

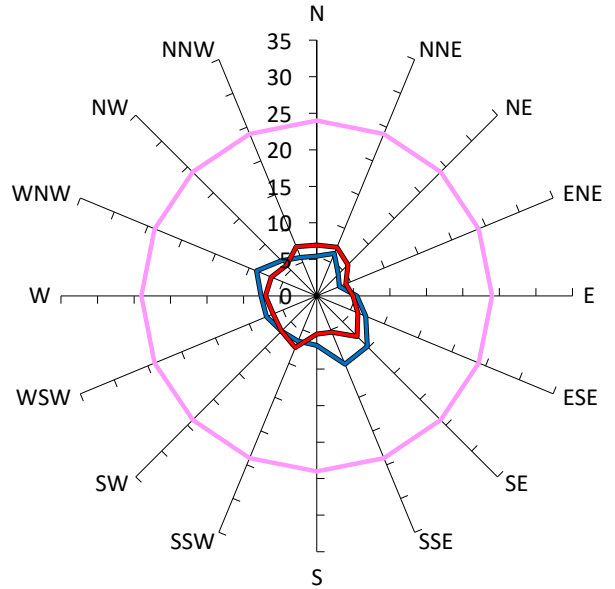
Results for Point 61

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

0%

10

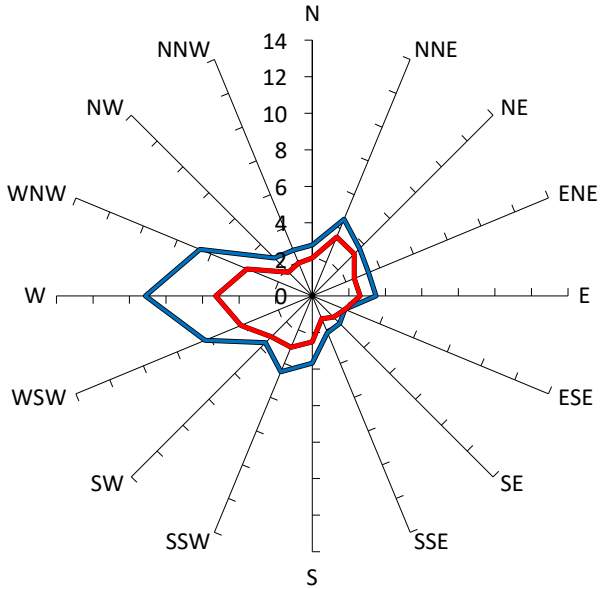
— With inclusion of Existing and Retained Trees

0%

8

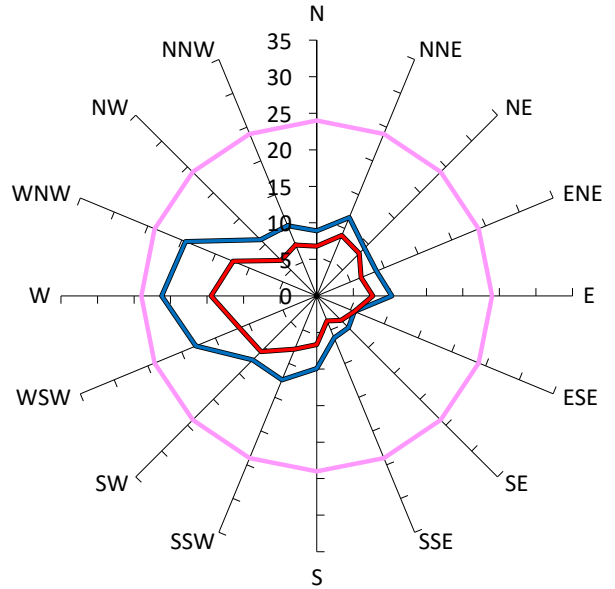
Results for Point 62

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

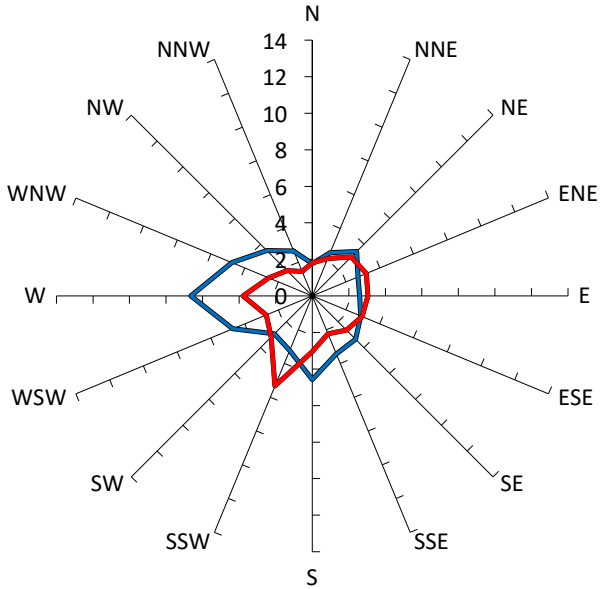
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	3%	21
With inclusion of Existing and Retained Trees	0%	14

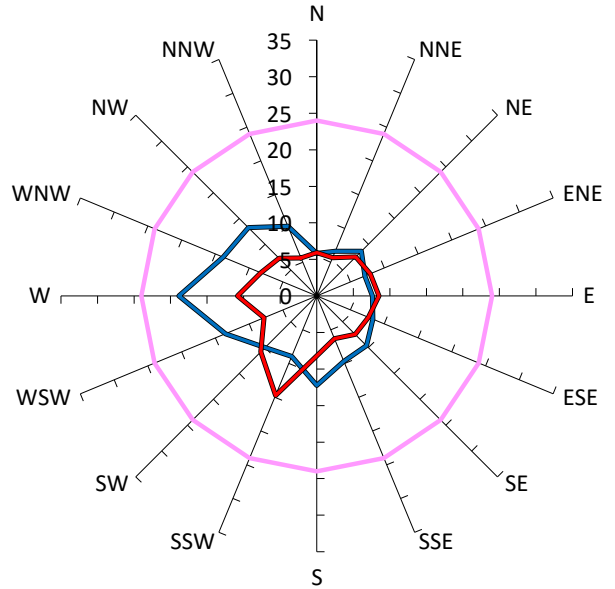
Results for Point 63

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

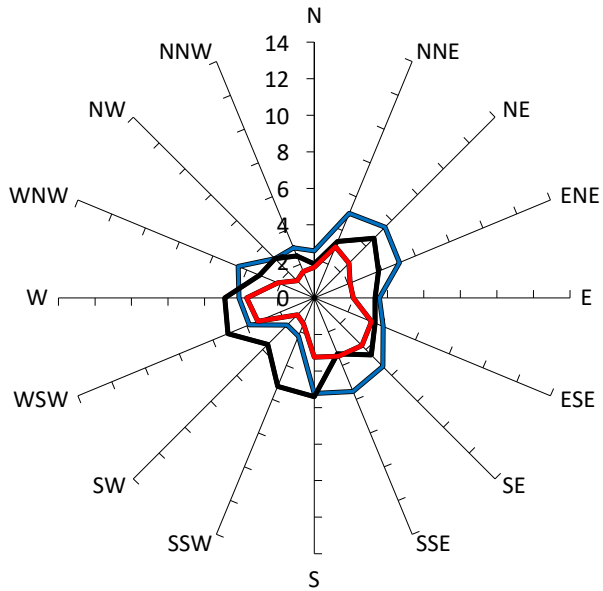
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	19
—	With inclusion of Existing and Retained Trees	0%	15
—			
—			
—			
—			
—			

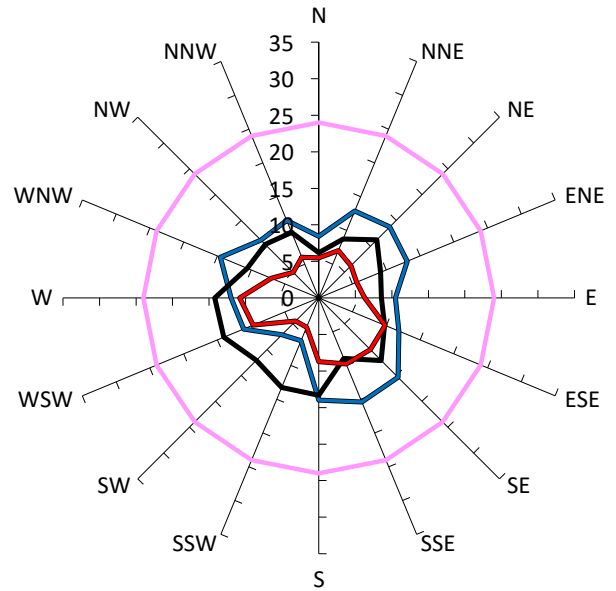
Results for Point 64

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

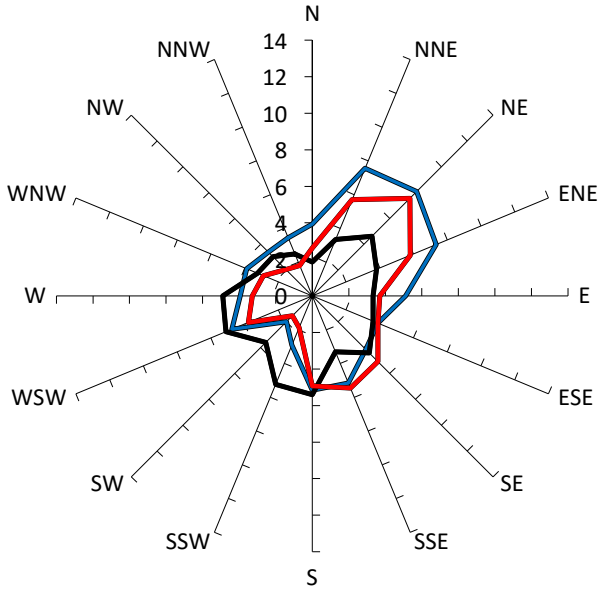
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	0%	15
—	Existing Site	0%	14
—	With inclusion of Existing and Retained Trees	0%	11
—			
—			
—			
—			
—			

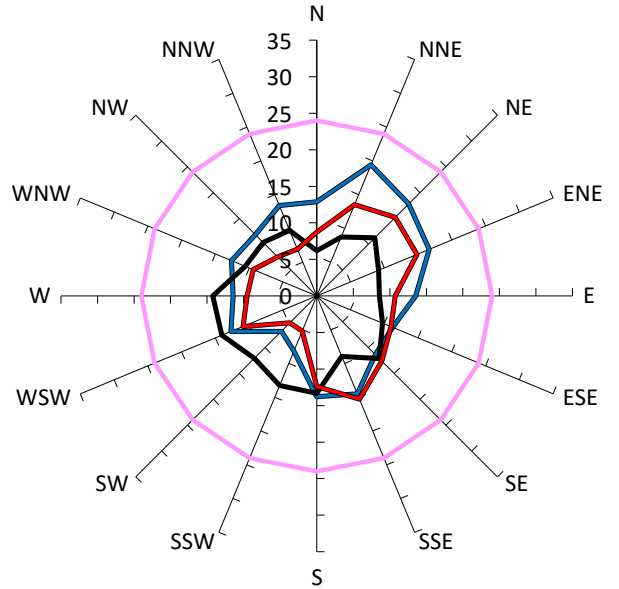
Results for Point 65

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

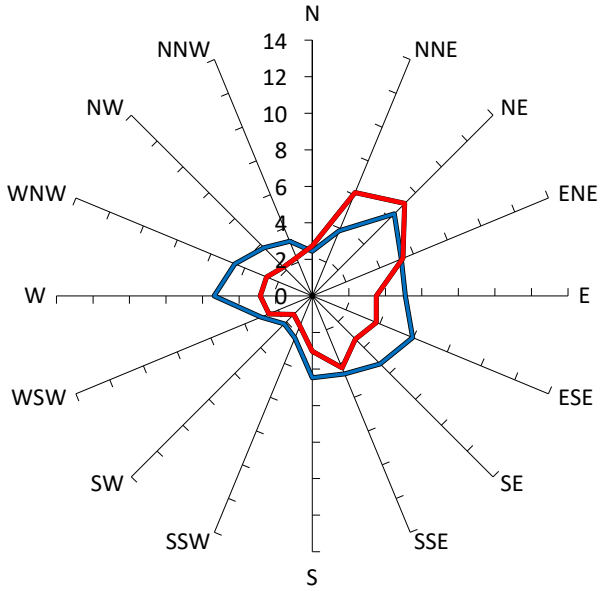
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	3%	19
Existing Site	0%	14
With inclusion of Existing and Retained Trees	1%	15

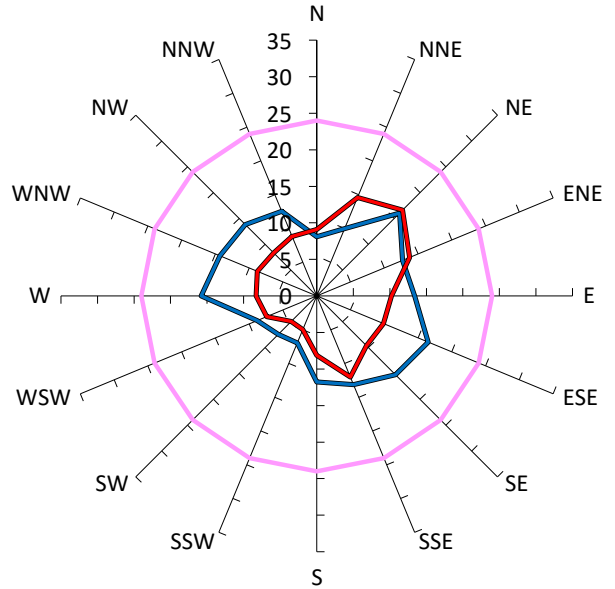
Results for Point 66

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

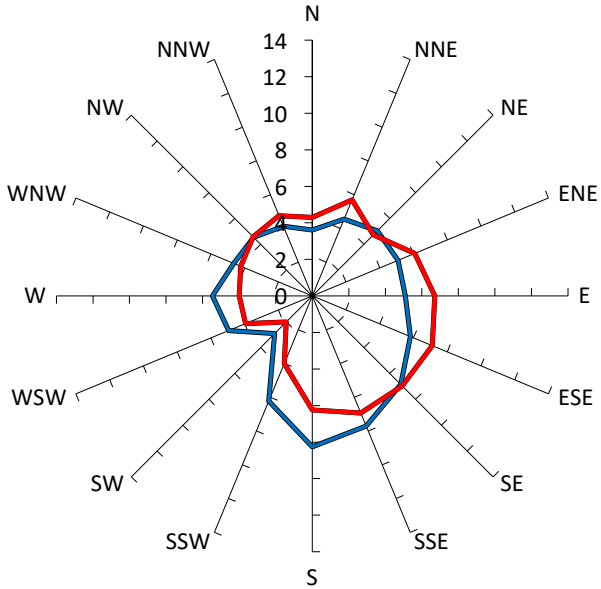
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	1%	17
With inclusion of Existing and Retained Trees	1%	17

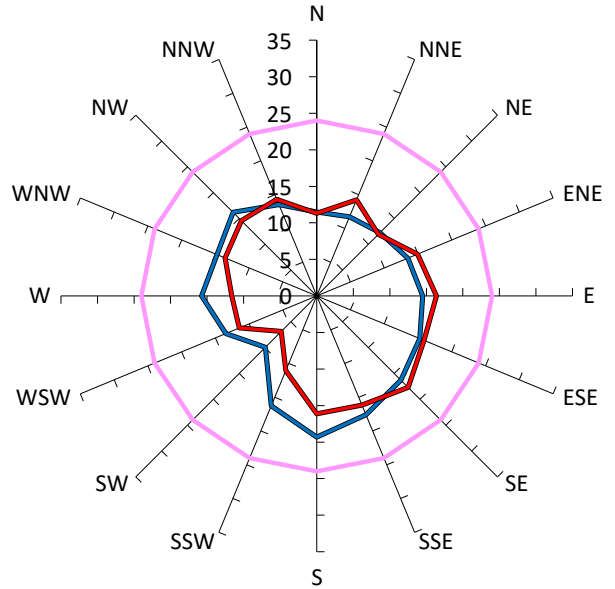
Results for Point 67

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

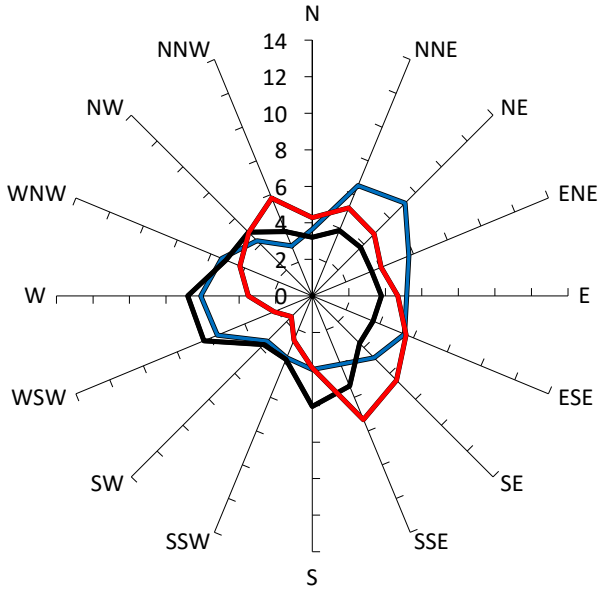
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	4%	19
—	With inclusion of Existing and Retained Trees	3%	18
—			
—			
—			
—			
—			

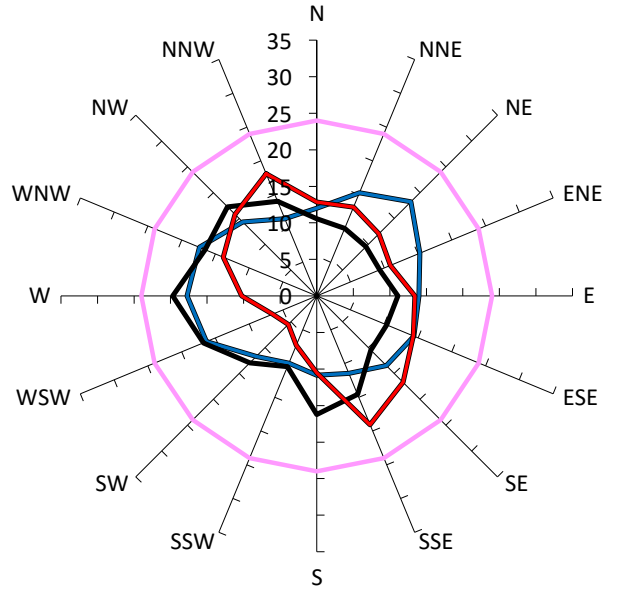
Results for Point 68

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

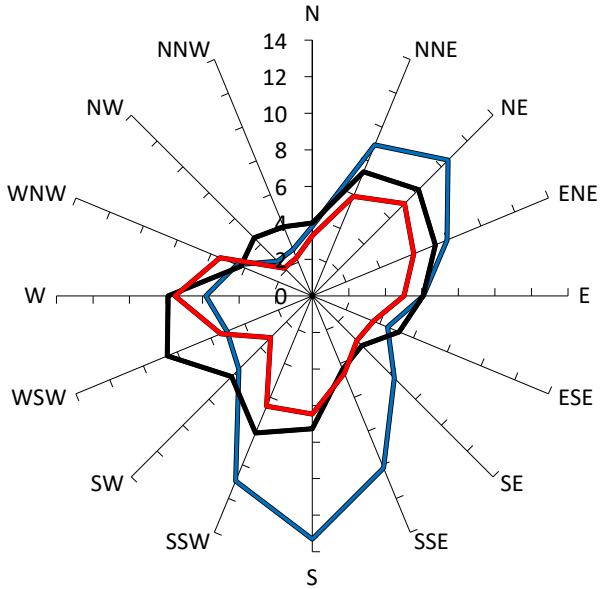
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	18
—	Existing Site	1%	20
—	With inclusion of Existing and Retained Trees	2%	19
—			
—			
—			
—			
—			

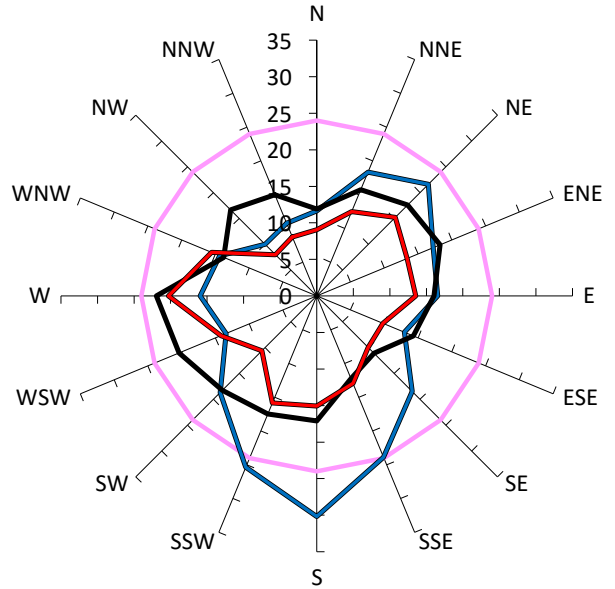
Results for Point 69

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

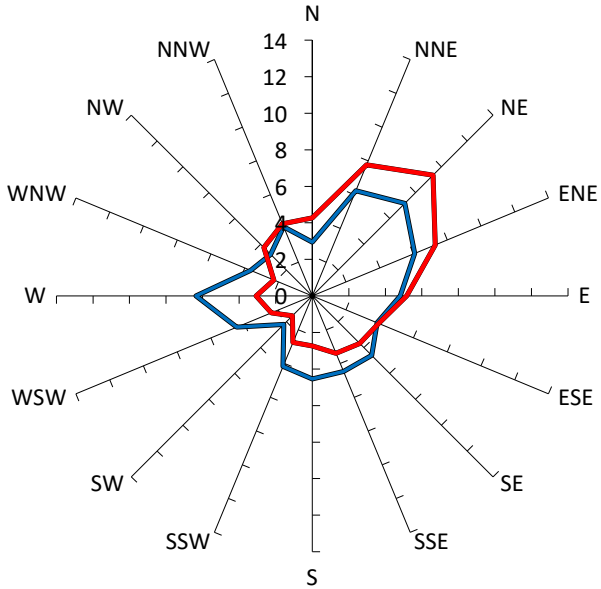
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	28%	30
—	Existing Site	8%	22
—	With inclusion of Existing and Retained Trees	2%	20
—			
—			
—			
—			
—			

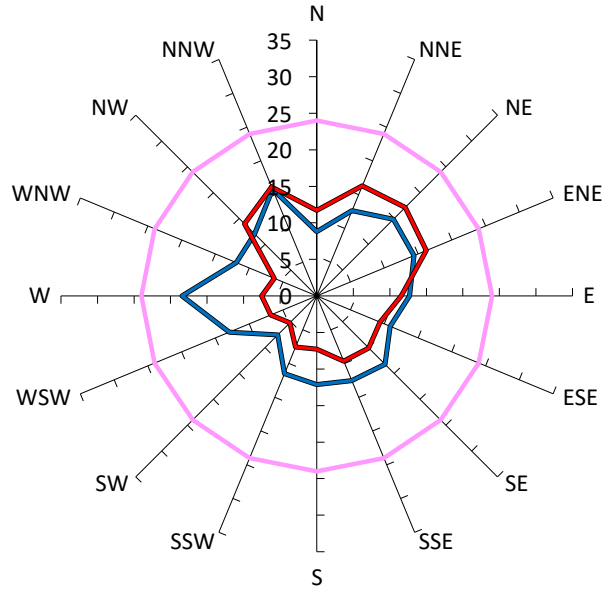
Results for Point 70

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

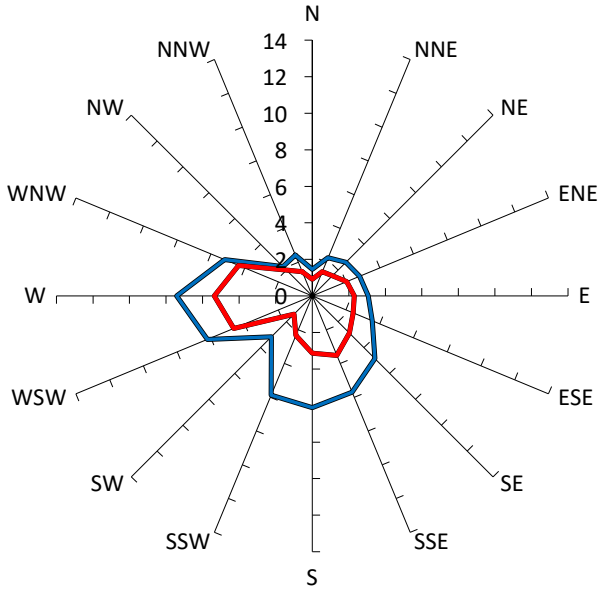
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	18
—			
—	With inclusion of Existing and Retained Trees	5%	17
—			
—			
—			
—			
—			

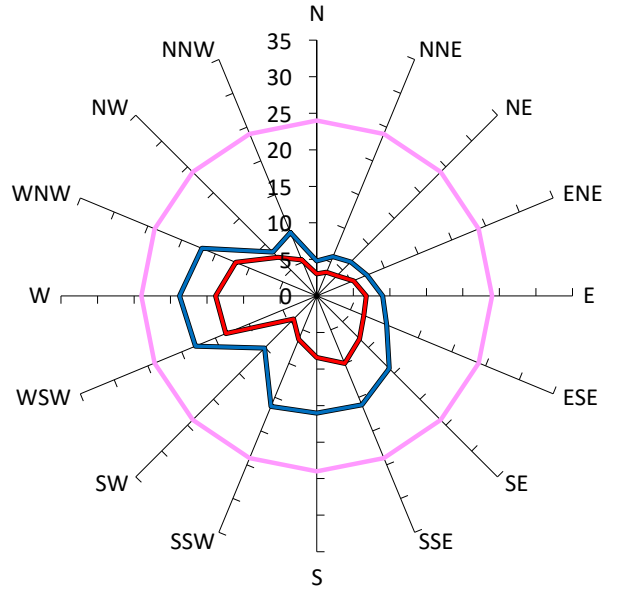
Results for Point 71

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

2%

19

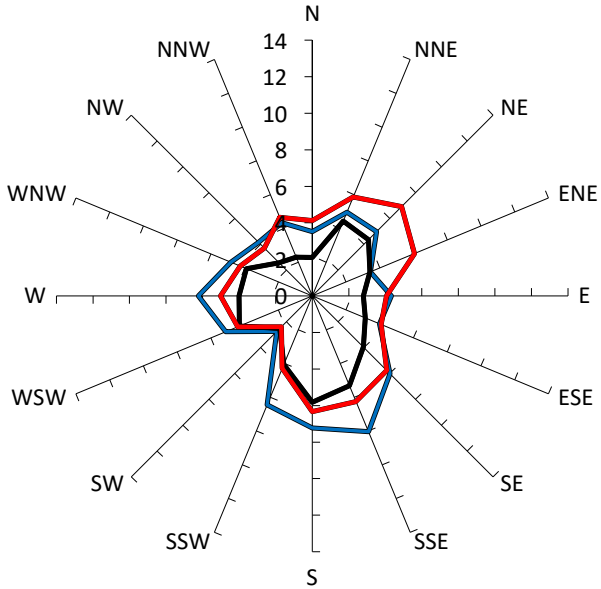
— With inclusion of Existing and Retained Trees

0%

14

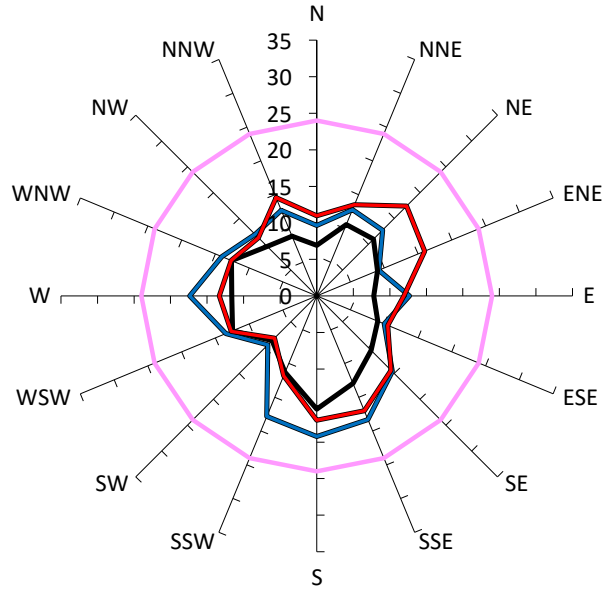
Results for Point 72

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

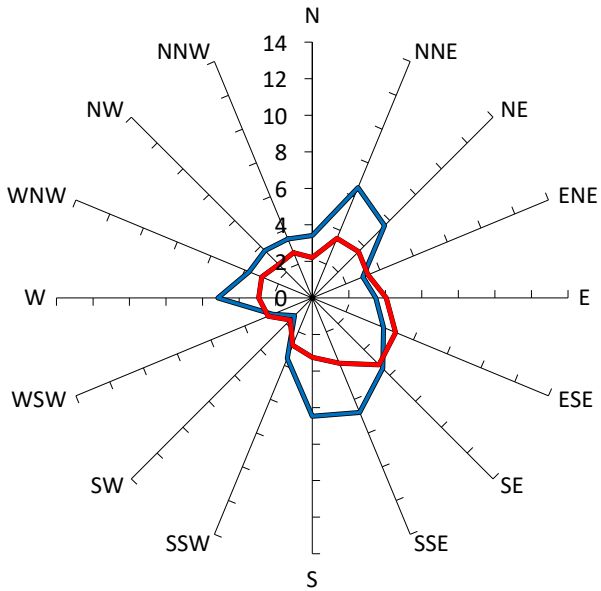
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	3%	19
—	Existing Site	0%	15
—	With inclusion of Existing and Retained Trees	1%	17
—			
—			
—			
—			
—			

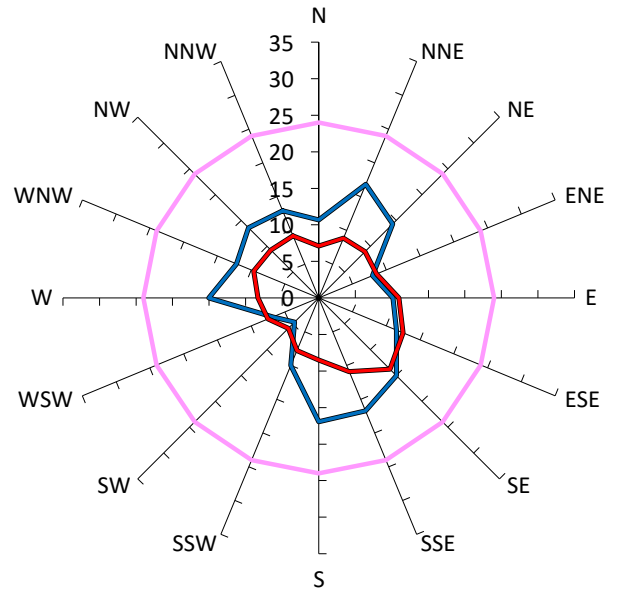
Results for Point 73

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of
Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

1%

17

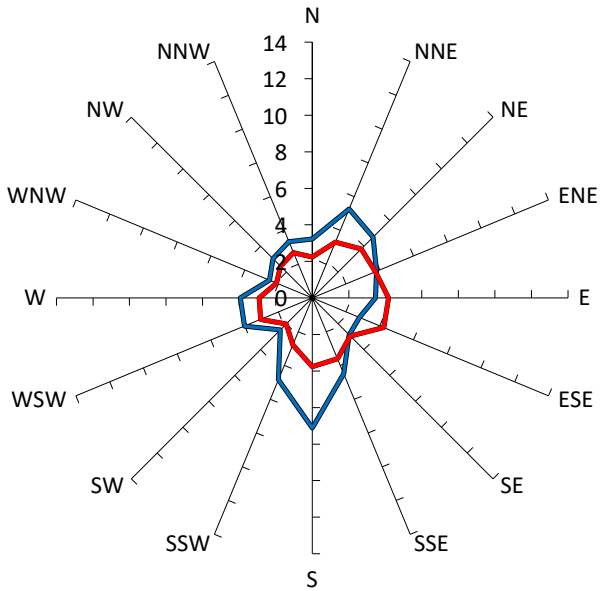
— With inclusion of Existing and Retained Trees

0%

14

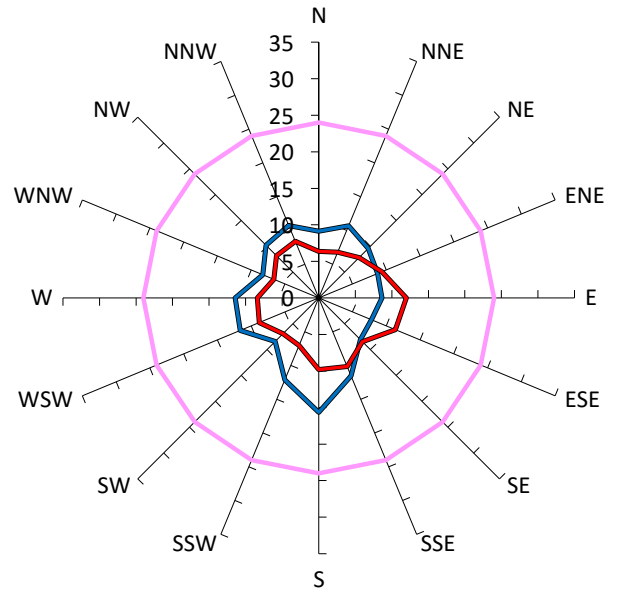
Results for Point 74

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

1%

16

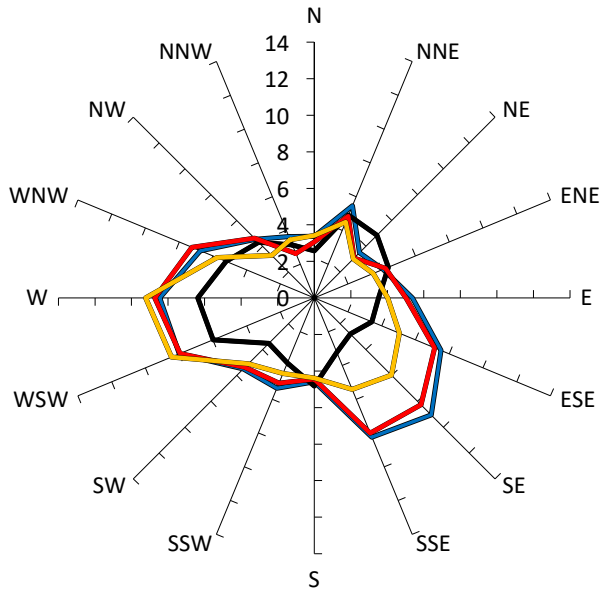
— With inclusion of Existing and Retained Trees

0%

12

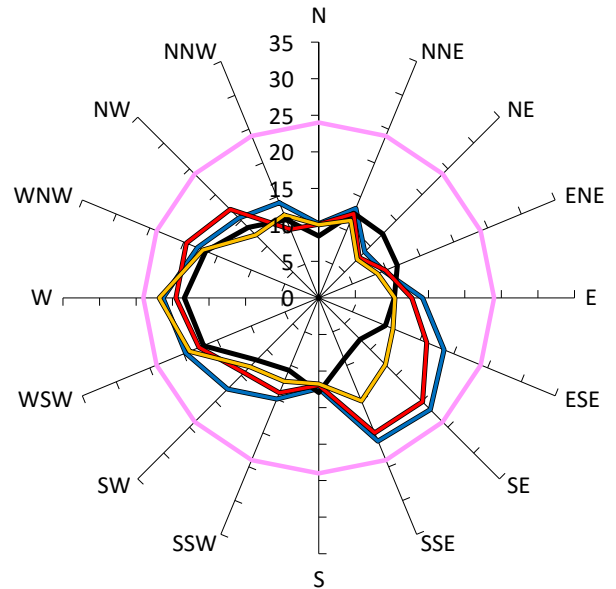
Results for Point 75

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

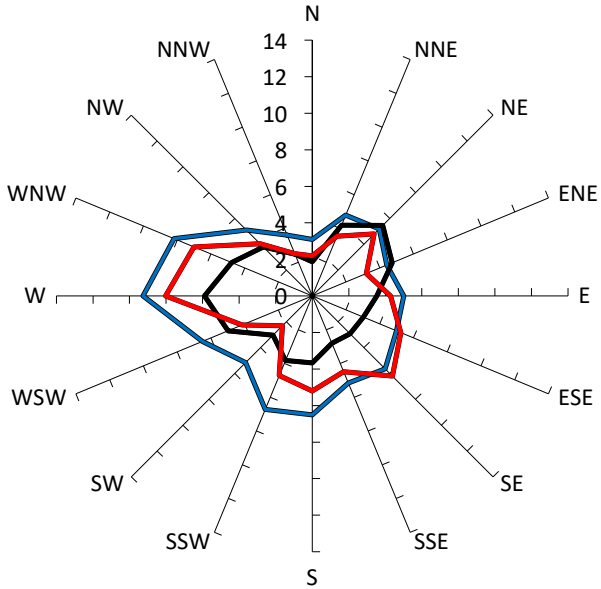
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	9%	22
—	Existing Site	1%	18
—	With inclusion of Existing and Retained Trees	8%	20
—	Inclusion of porous screen - 5m length x 2m height adjacent Building U4	5%	22
—			
—			
—			
—			

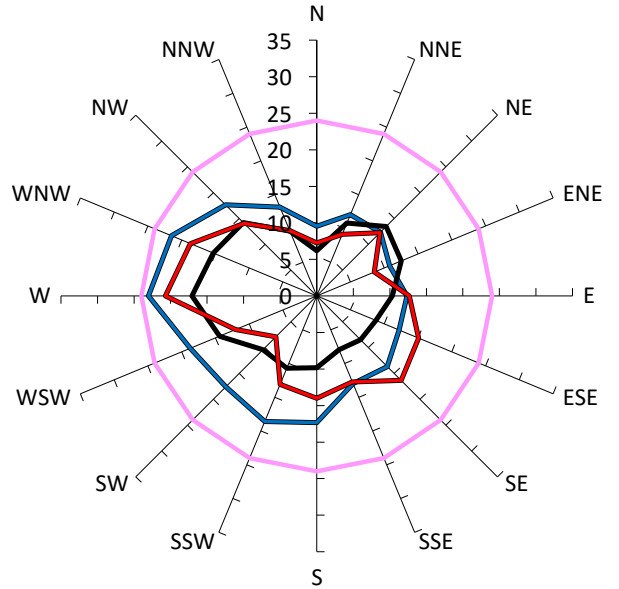
Results for Point 76

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

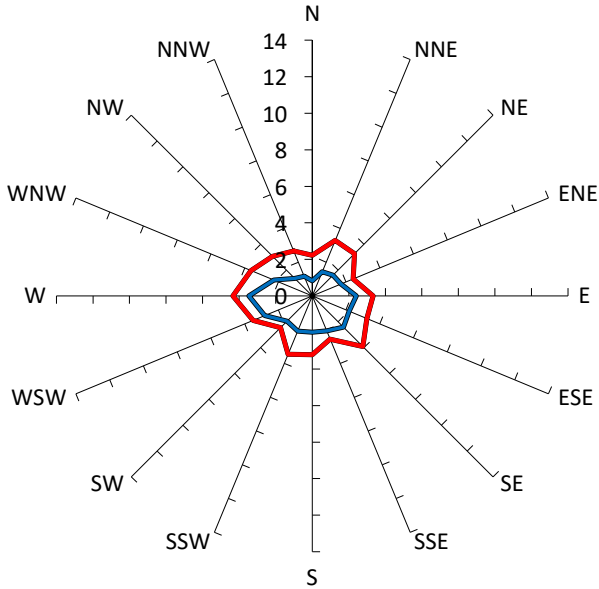
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	5%	23
—	Existing Site	0%	17
—	With inclusion of Existing and Retained Trees	2%	21
—			
—			
—			
—			
—			

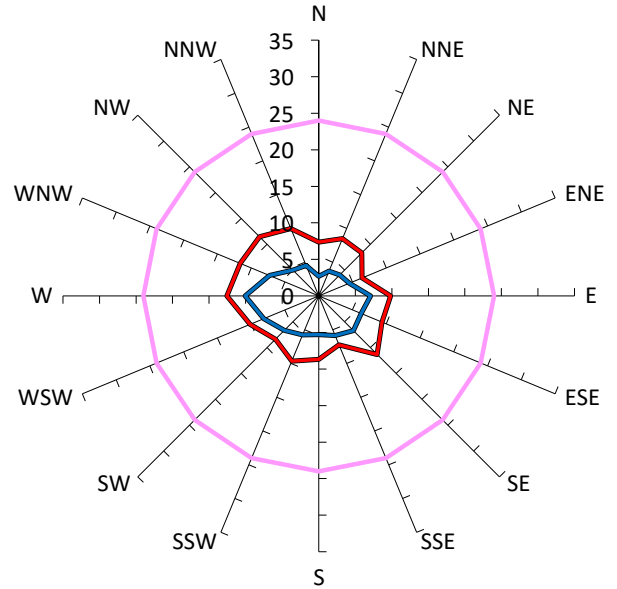
Results for Point 77

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

0%

10

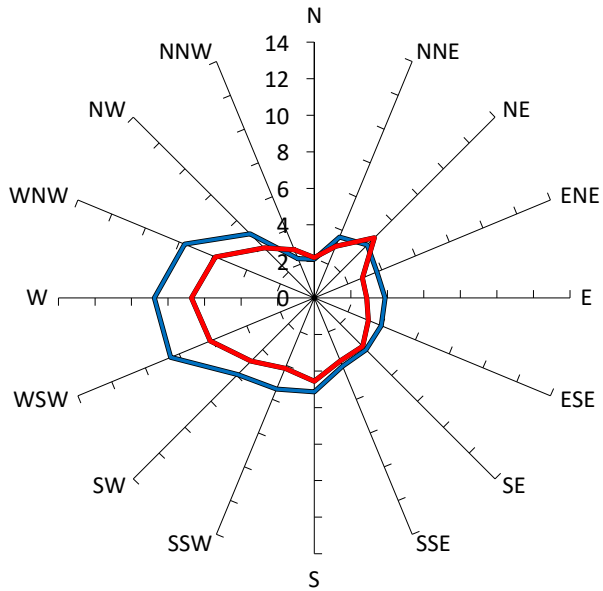
— With inclusion of Existing and Retained Trees

0%

13

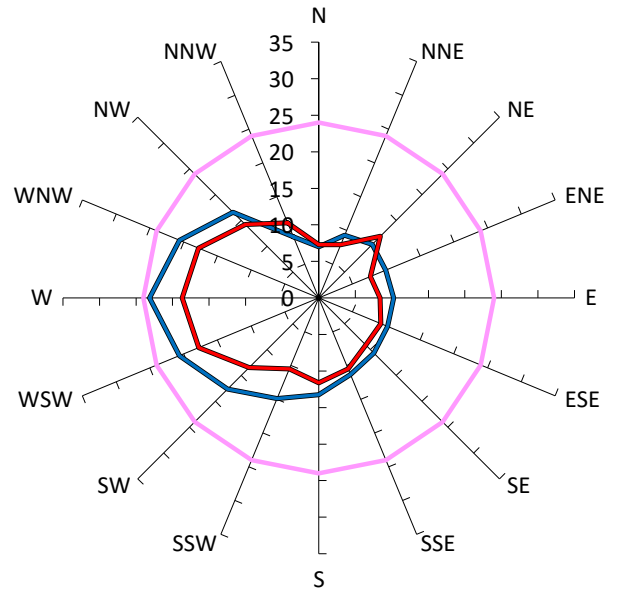
Results for Point 78

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

5%

23

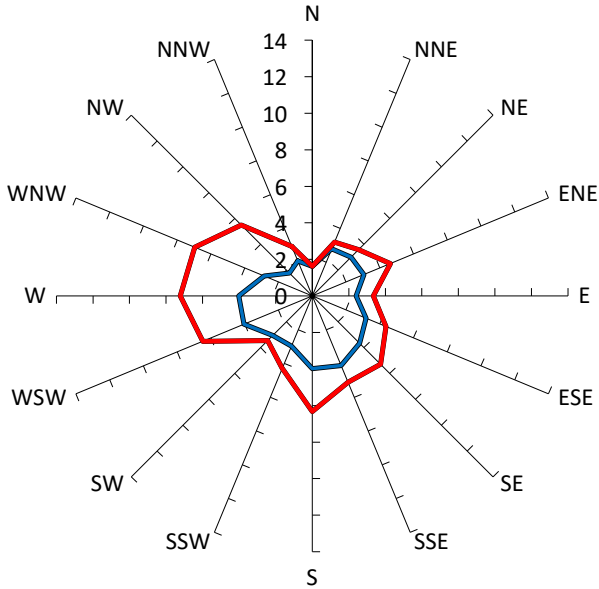
— With inclusion of Existing and Retained Trees

1%

19

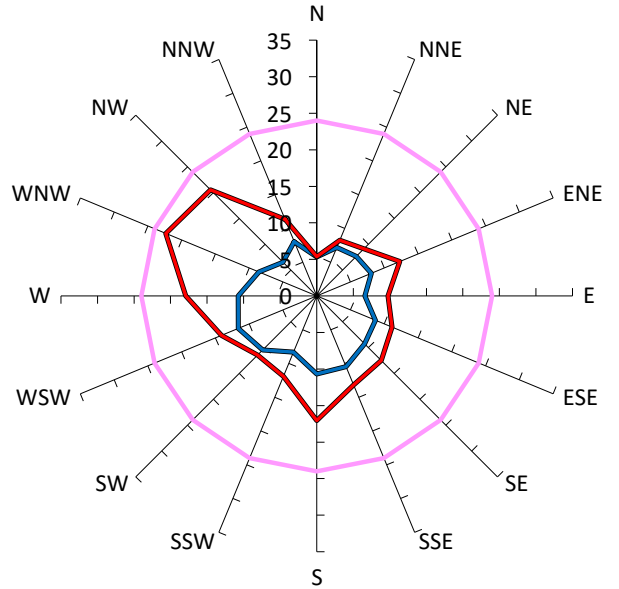
Results for Point 79

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

0%

12

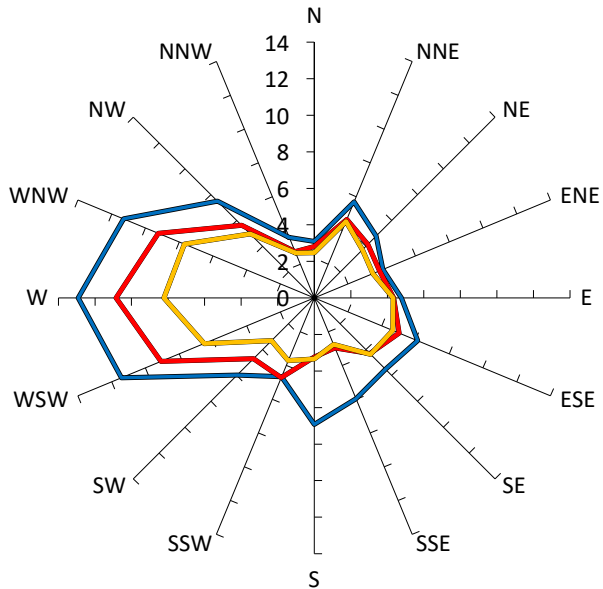
— With inclusion of Existing and Retained Trees

2%

22

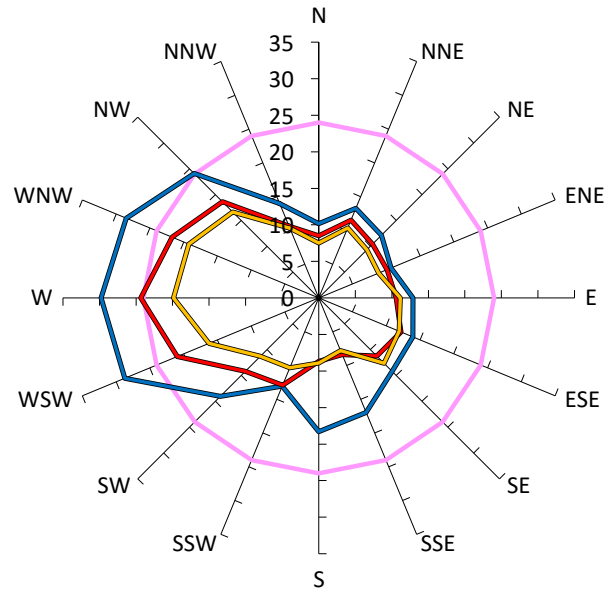
Results for Point 80

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

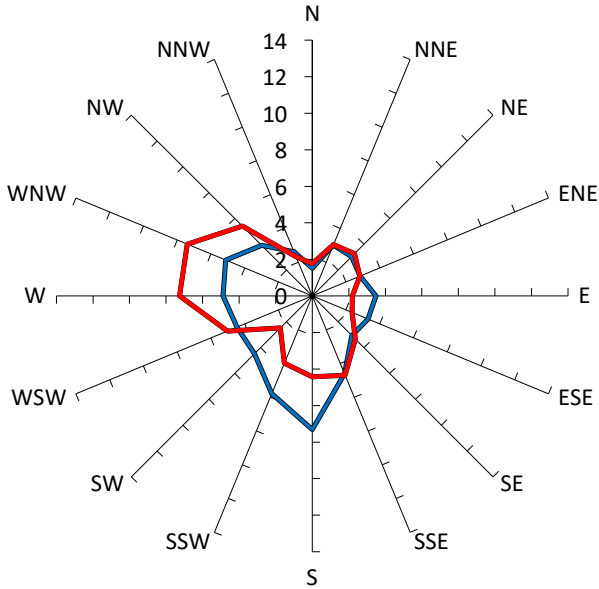
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	15%	30
Wrap around awning along Western and part of Southern Façade of LOT U	9%	24
Awning along Western and Southern façade of LOT U	3%	20

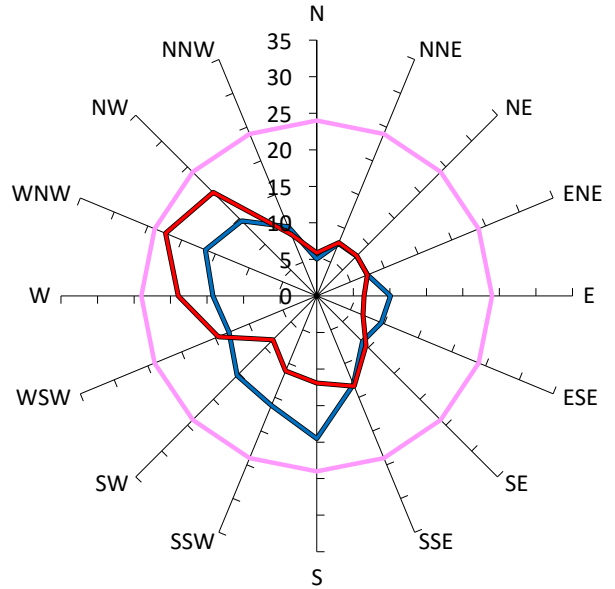
Results for Point 81

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

1%

20

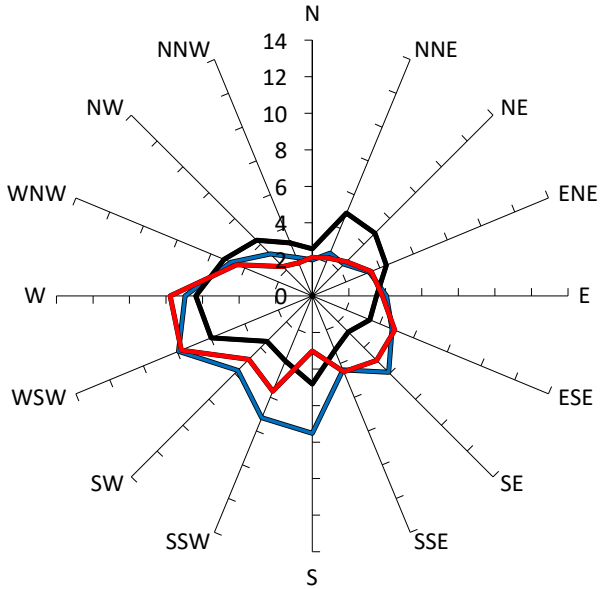
— With inclusion of Existing and Retained Trees

2%

22

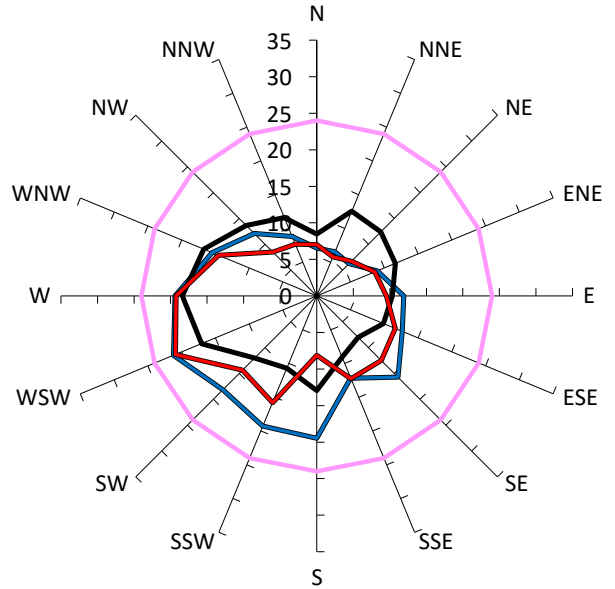
Results for Point 82

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

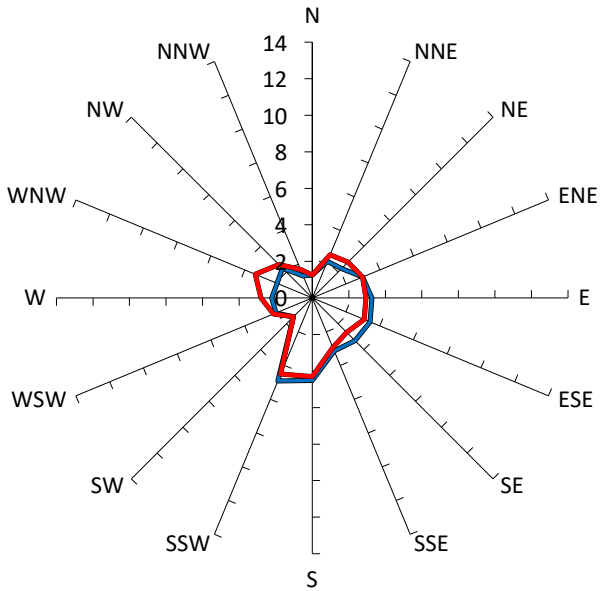
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	4%	21
Existing Site	1%	18
With inclusion of Existing and Retained Trees	2%	21

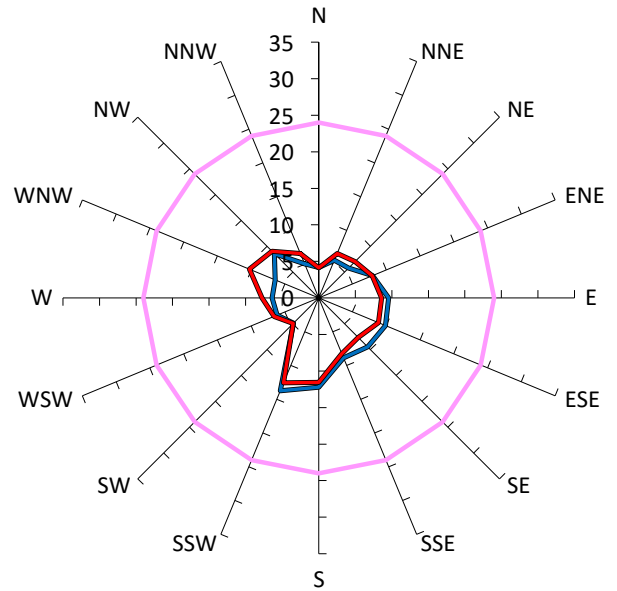
Results for Point 83

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

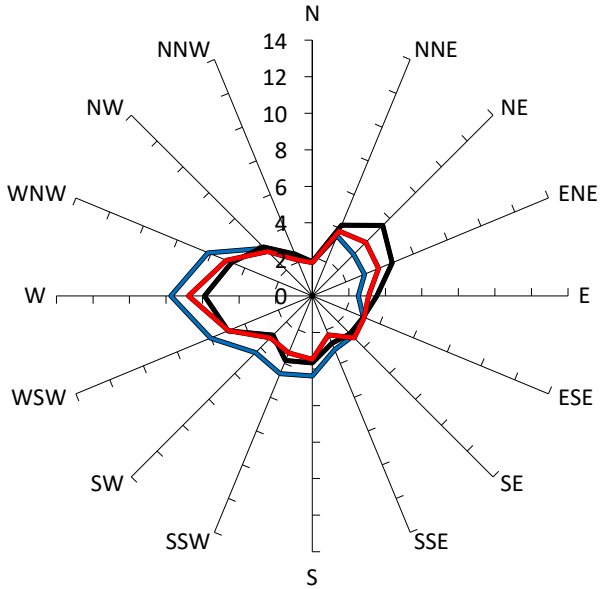
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	0%	14
With inclusion of Existing and Retained Trees	0%	13

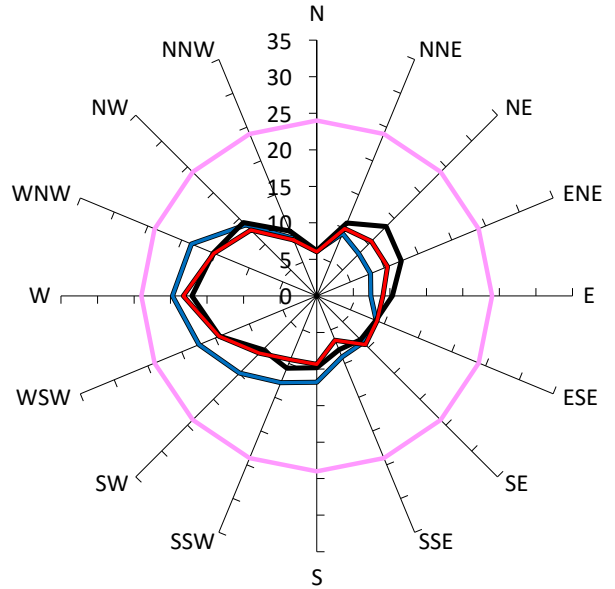
Results for Point 84

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

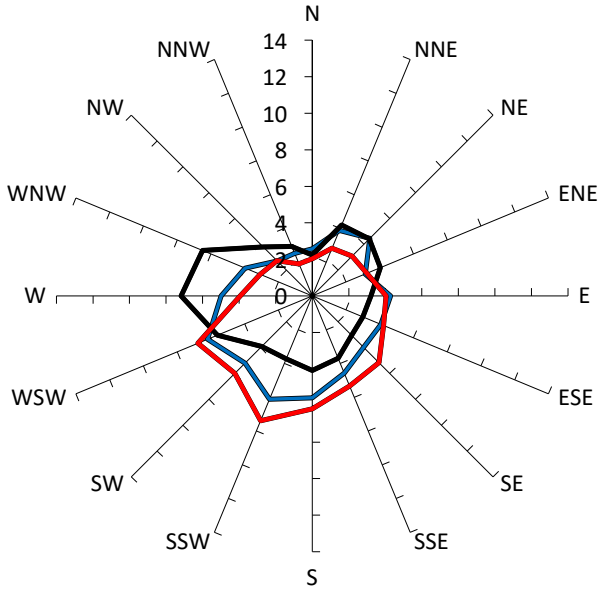
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	2%	20
—	Existing Site	0%	17
—	With inclusion of Existing and Retained Trees	1%	18
—			
—			
—			
—			
—			

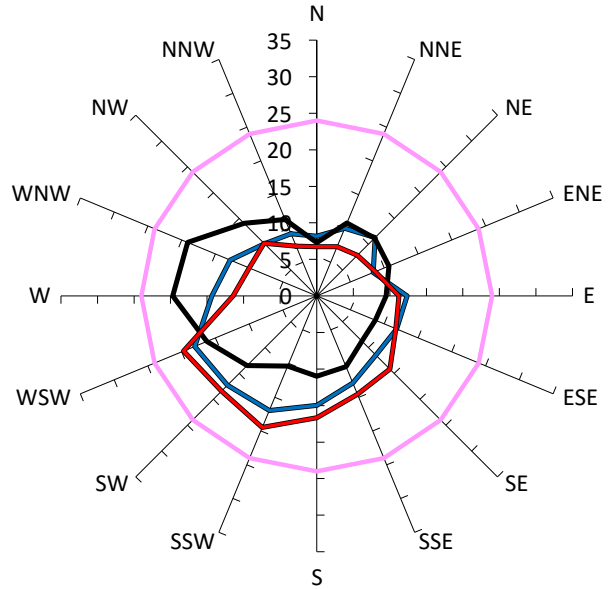
Results for Point 85

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

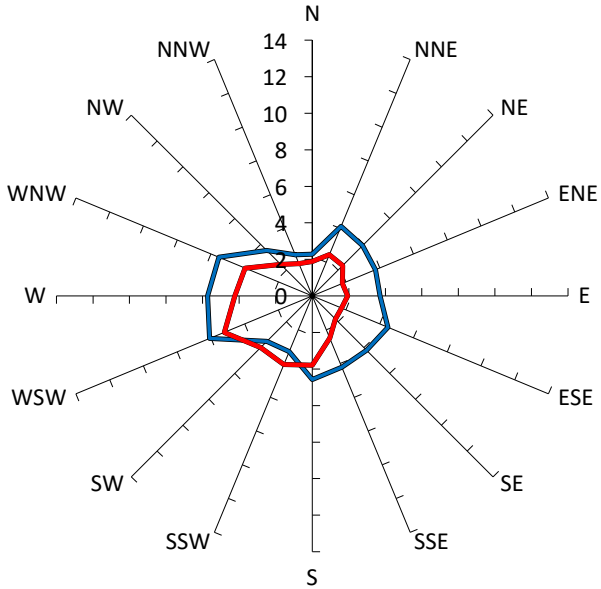
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	18
—	Existing Site	1%	20
—	With inclusion of Existing and Retained Trees	2%	20
—			
—			
—			
—			
—			

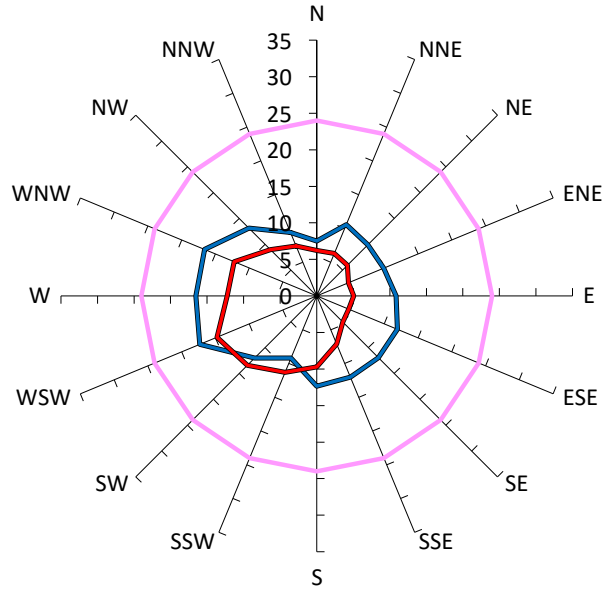
Results for Point 86

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

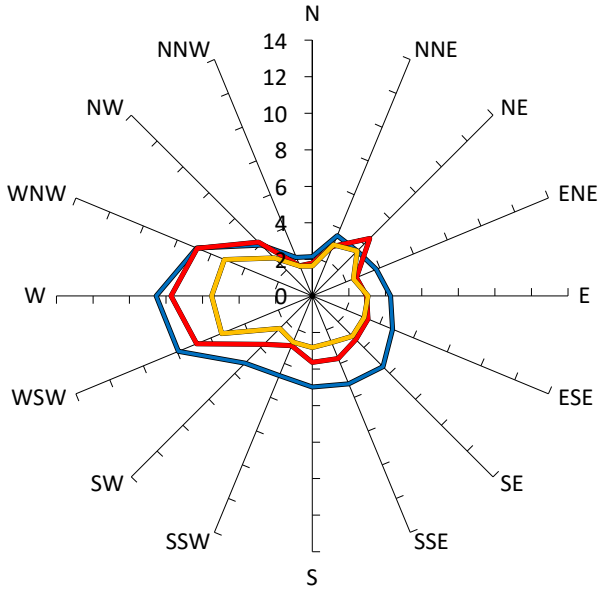
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	1%	17
With inclusion of Existing and Retained Trees	0%	15

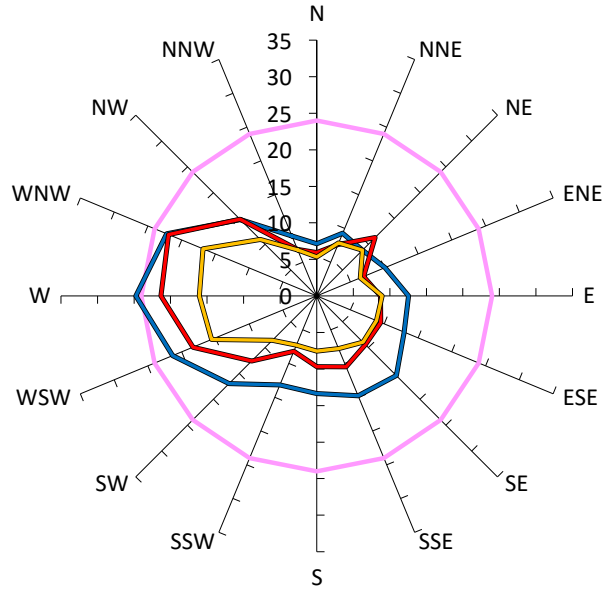
Results for Point 87

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

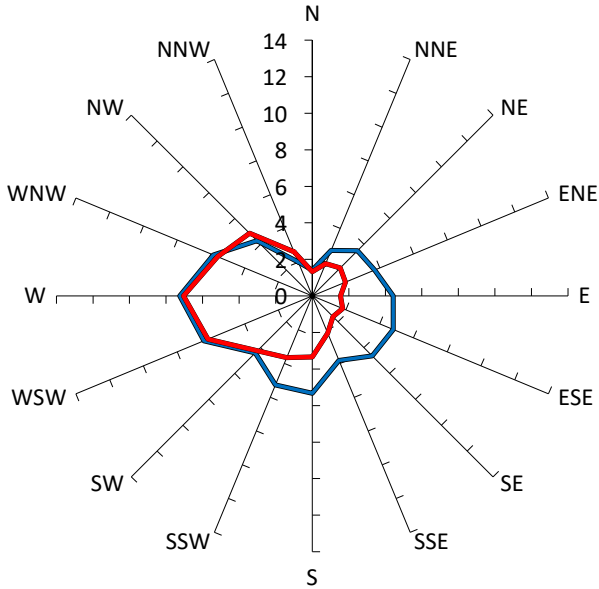
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	4%	25
—	Wrap around awning along Western and part of Southern Façade of LOT U	2%	22
—	Awning along Western and Southern façade of LOT U	0%	17
—			
—			
—			
—			

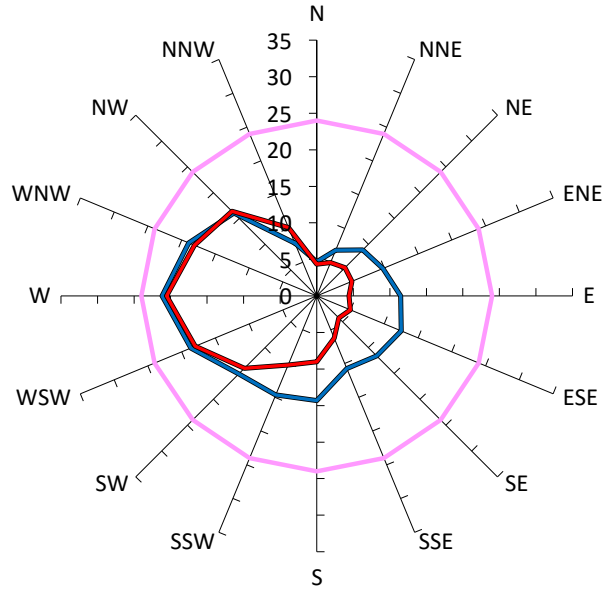
Results for Point 88

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

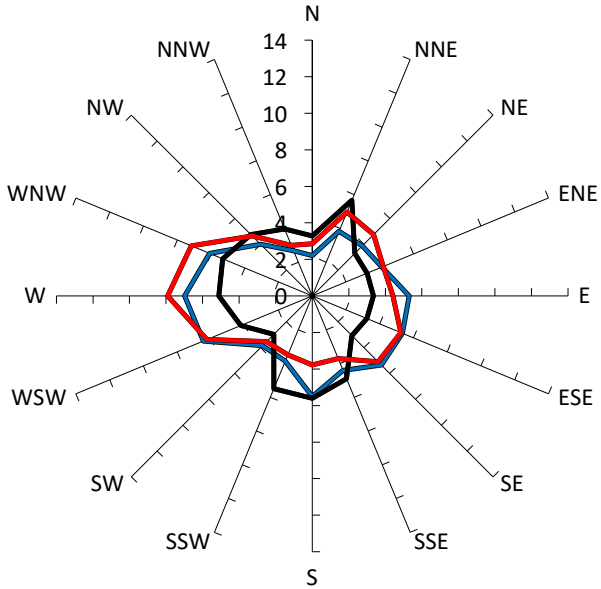
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	2%	21
—			
—	With inclusion of Existing and Retained Trees	1%	21
—			
—			
—			
—			
—			

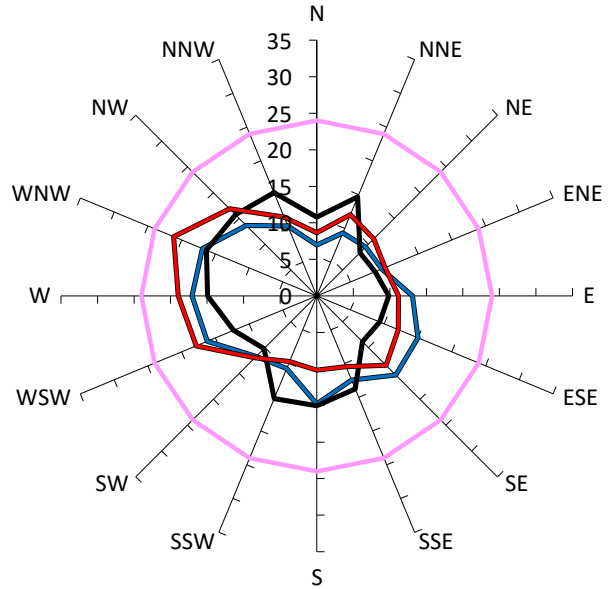
Results for Point 89

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

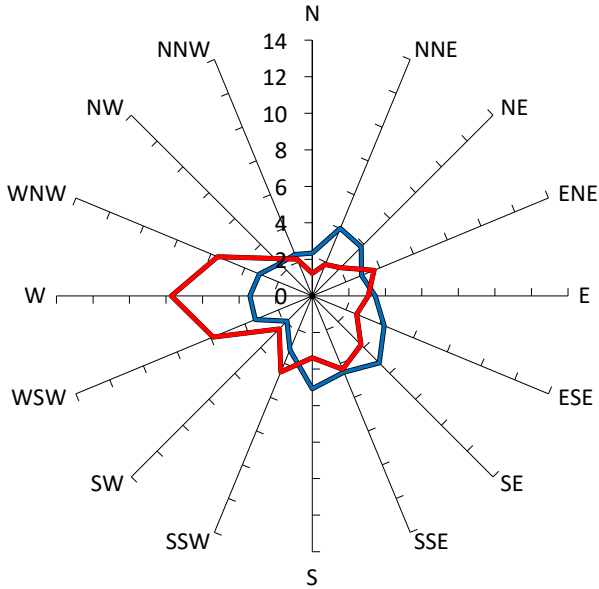
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	2%	17
—	Existing Site	1%	16
—	With inclusion of Existing and Retained Trees	2%	21
—			
—			
—			
—			
—			

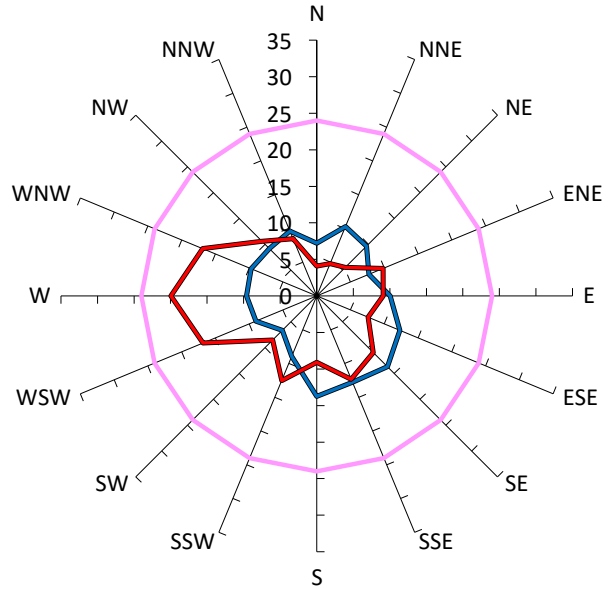
Results for Point 90

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

0%

14

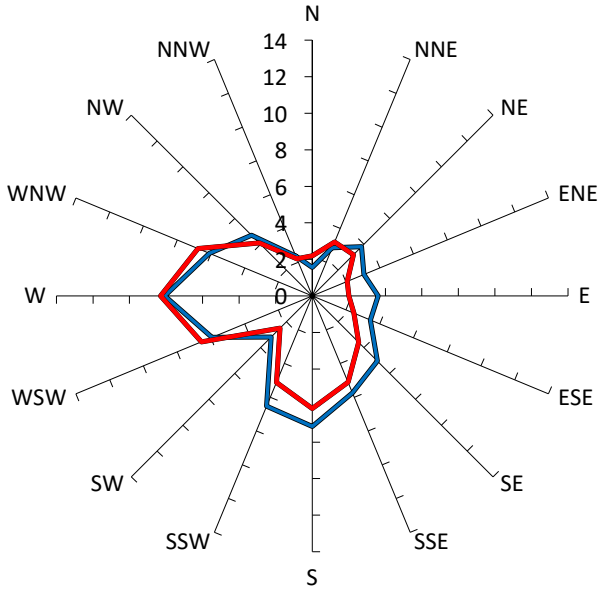
— With inclusion of Existing and Retained Trees

1%

20

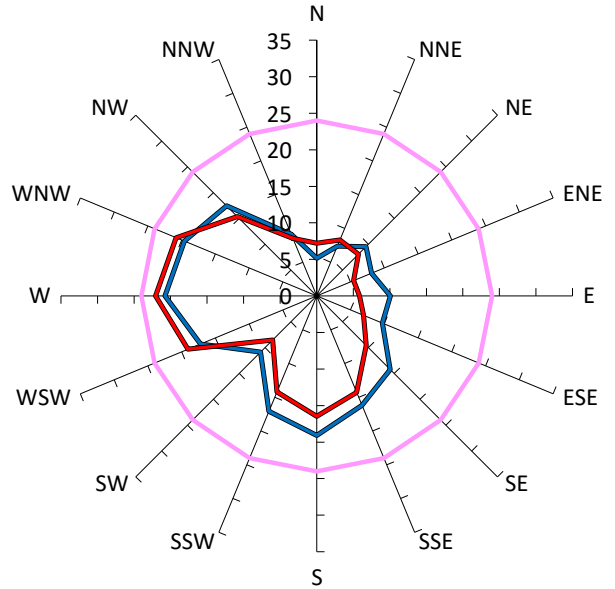
Results for Point 91

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

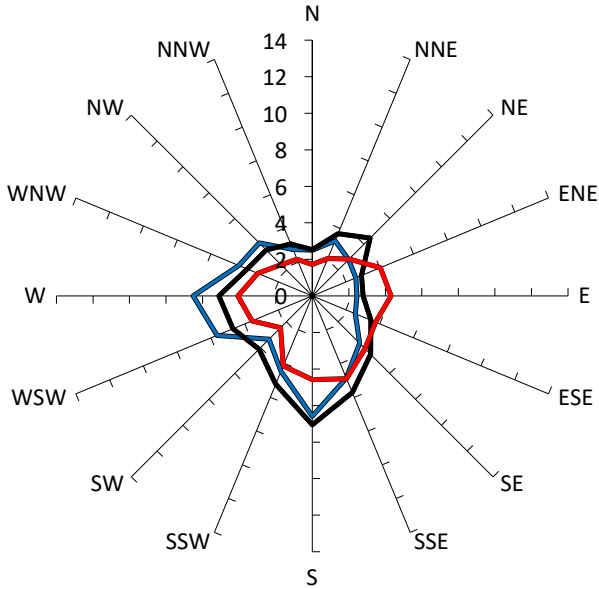
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	3%	21
—			
—	With inclusion of Existing and Retained Trees	3%	22
—			
—			
—			
—			
—			

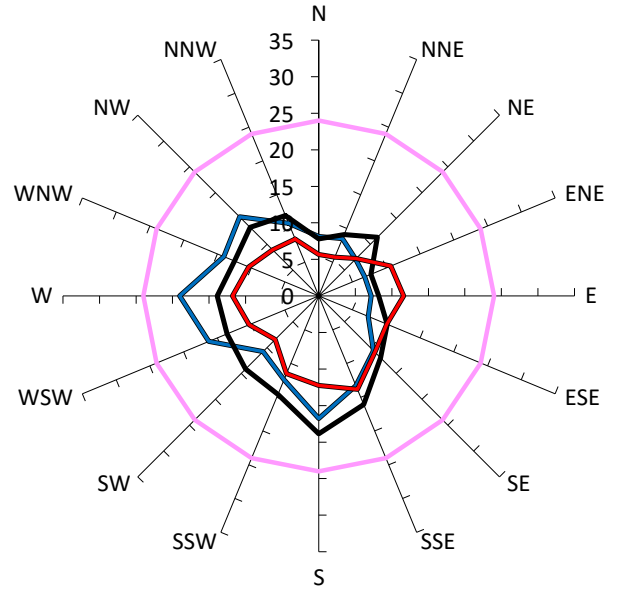
Results for Point 92

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

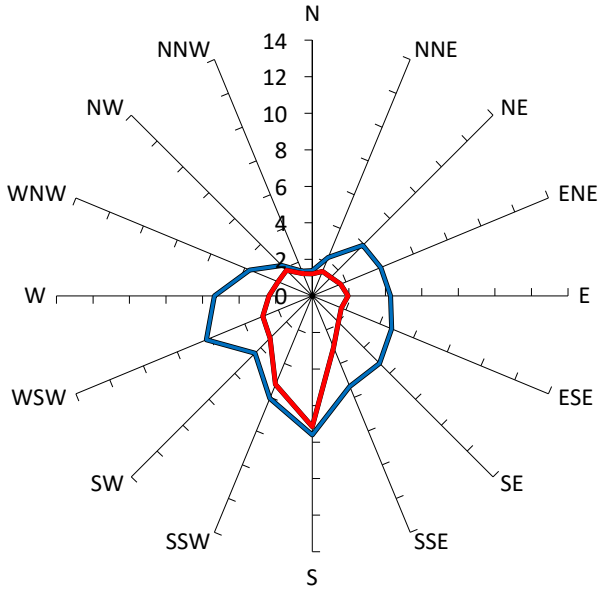
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	1%	19
Existing Site	1%	19
With inclusion of Existing and Retained Trees	0%	14

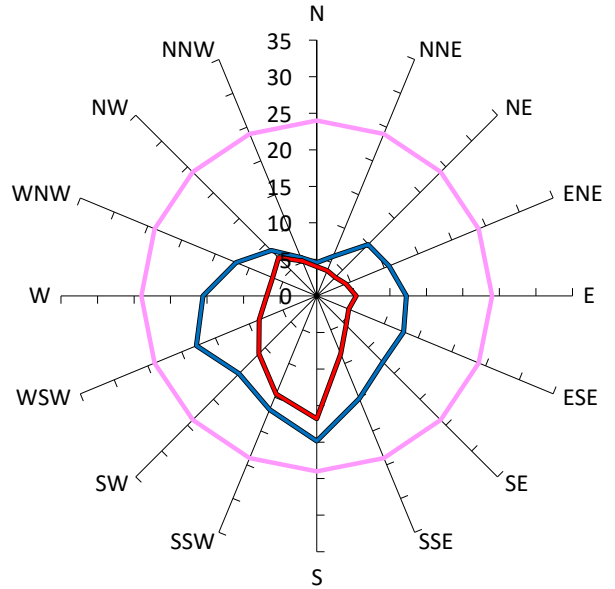
Results for Point 93

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

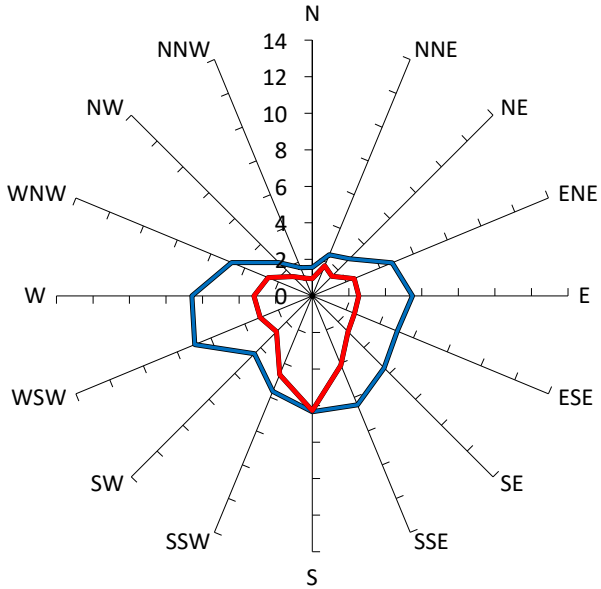
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	2%	20
—	With inclusion of Existing and Retained Trees	1%	17
—			
—			
—			
—			
—			

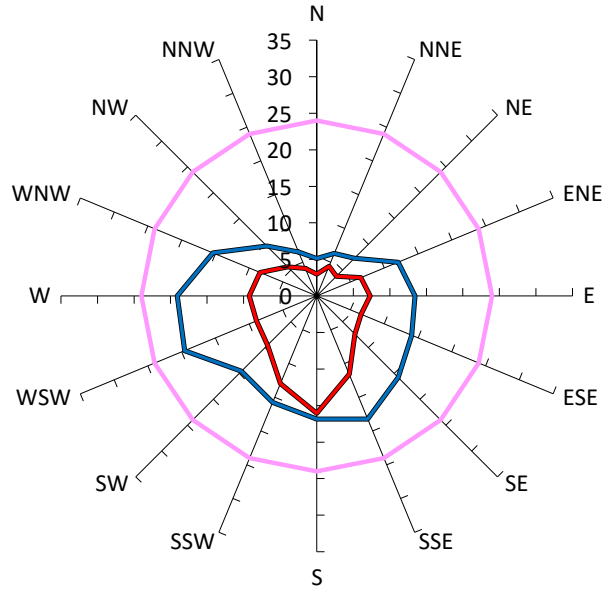
Results for Point 94

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

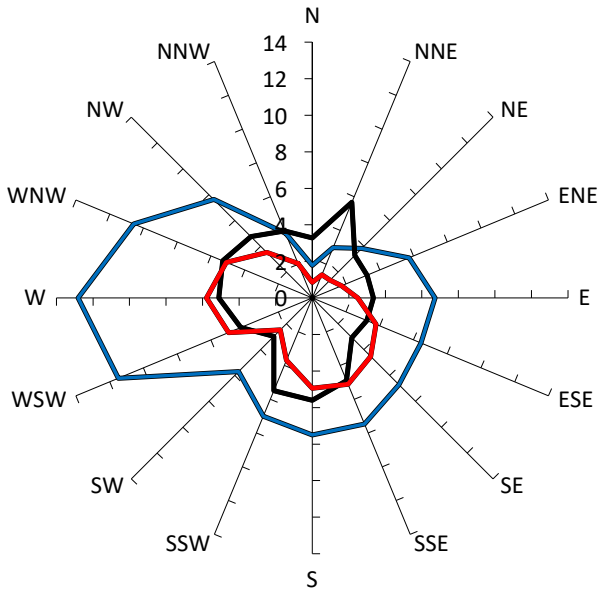
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	2%	20
With inclusion of Existing and Retained Trees	0%	16

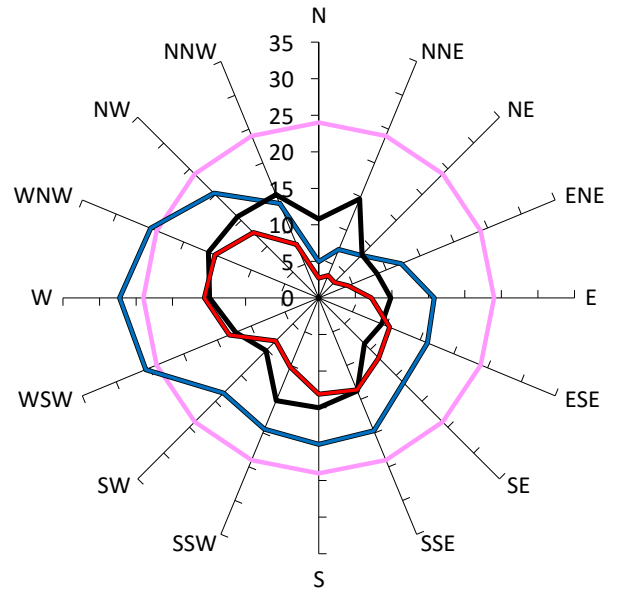
Results for Point 95

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

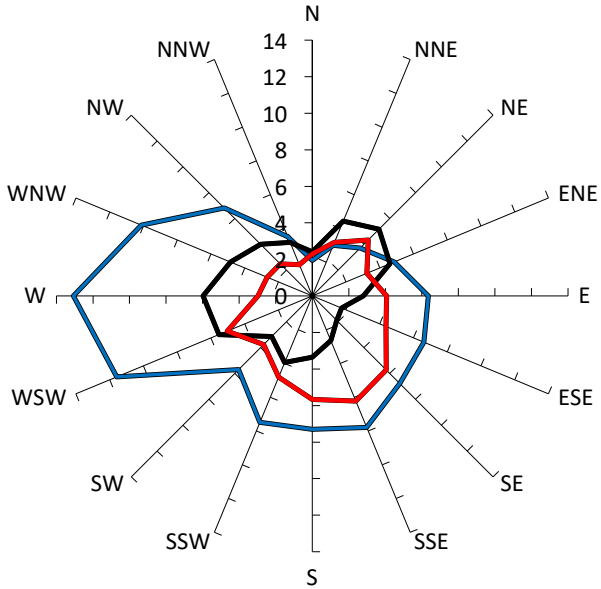
GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
— With development as proposed, no vegetation	16%	27
— Existing Site	1%	16
— Wrap around awning along Western Façade and part of Southern of Building Y1	0%	16
—		
—		
—		
—		
—		

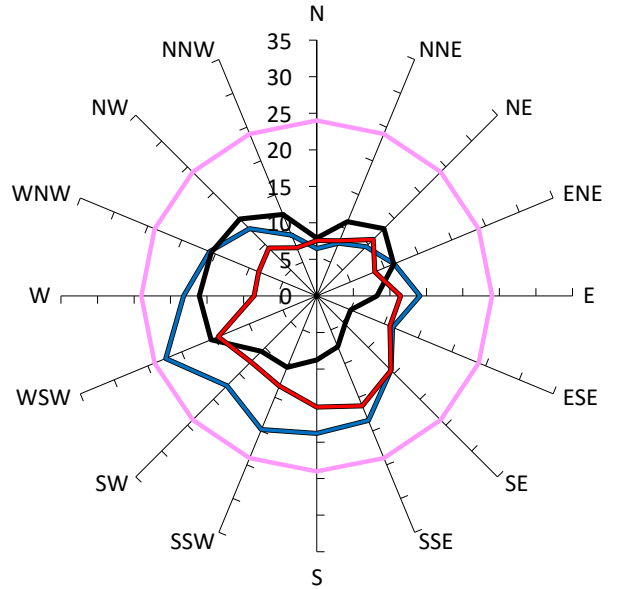
Results for Point 96

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

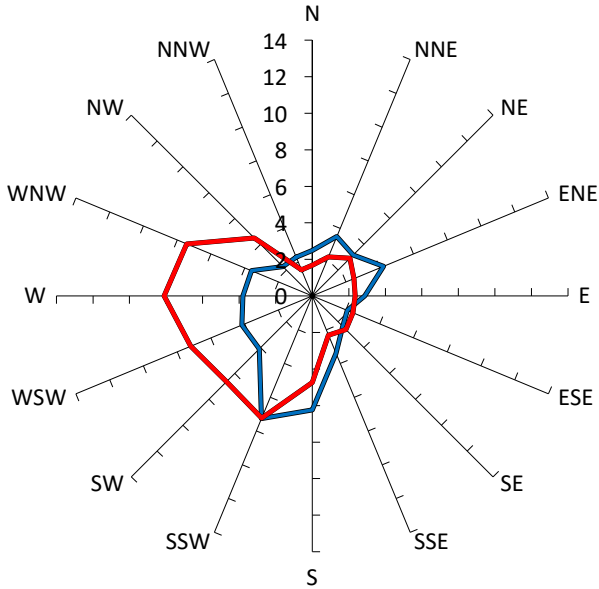
GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
— With development as proposed, no vegetation	16%	22
— Existing Site	1%	16
— With inclusion of Existing and Retained Trees	1%	16
—		
—		
—		
—		
—		

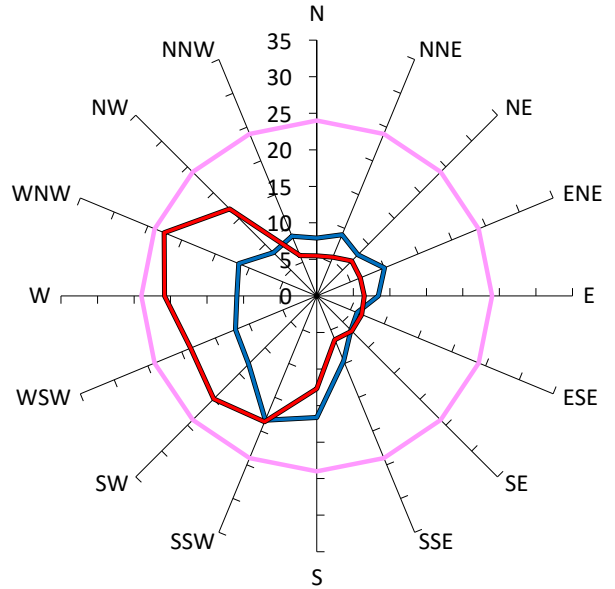
Results for Point 97

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

1%

18

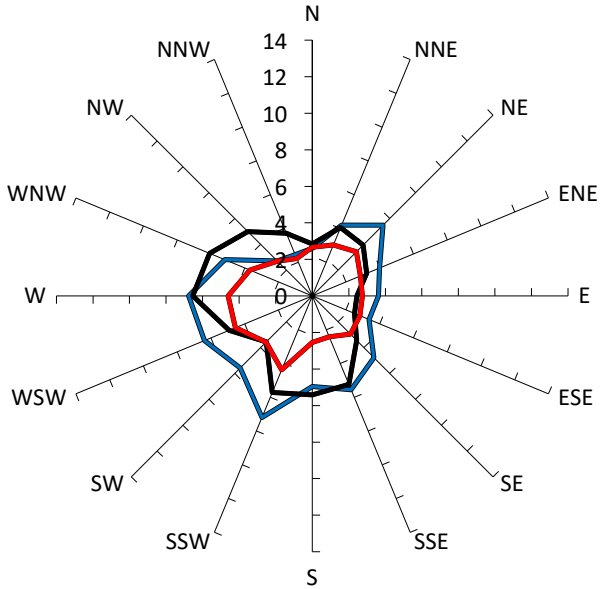
— With inclusion of Existing and Retained Trees

4%

23

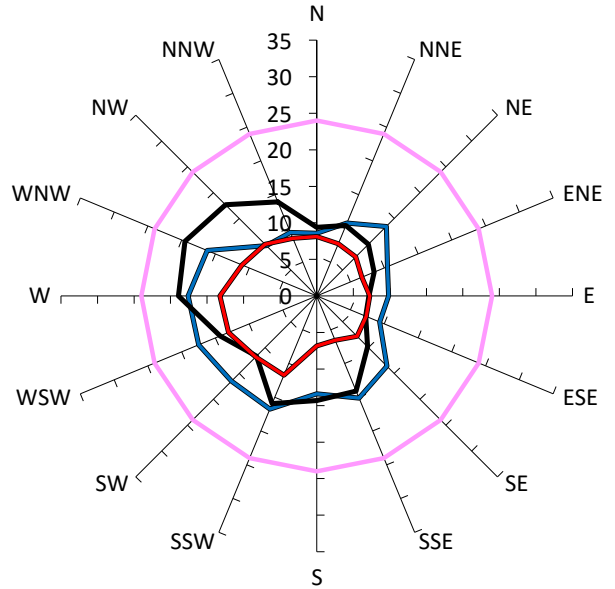
Results for Point 98

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

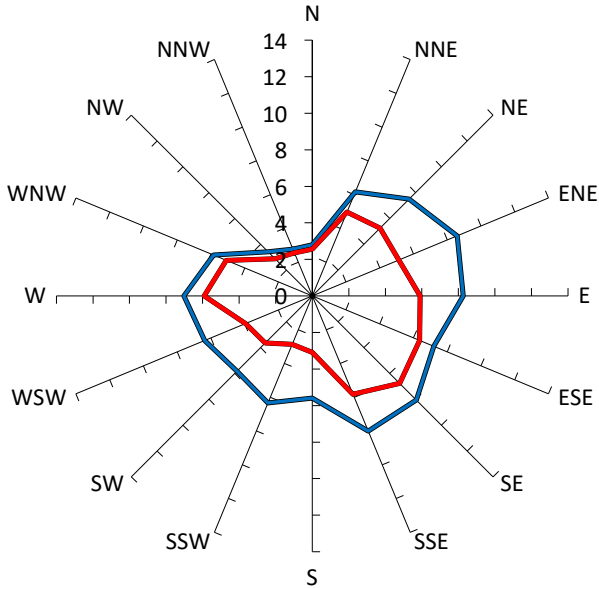
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	2%	18
—	Existing Site	1%	20
—	With inclusion of Existing and Retained Trees	0%	13
—			
—			
—			
—			
—			

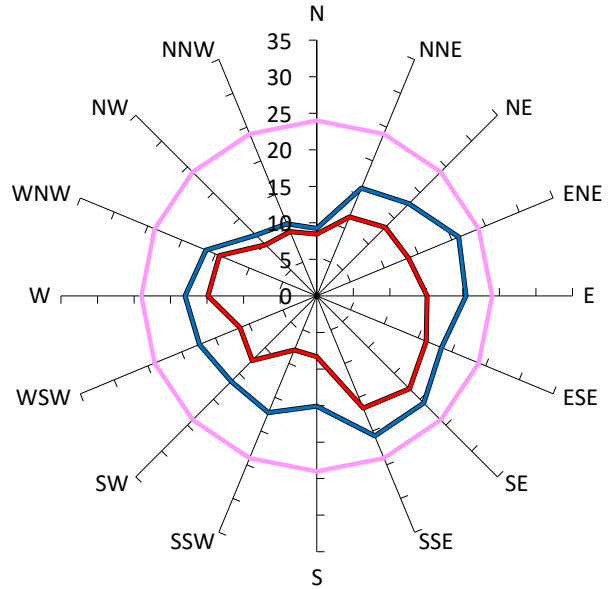
Results for Point 99

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

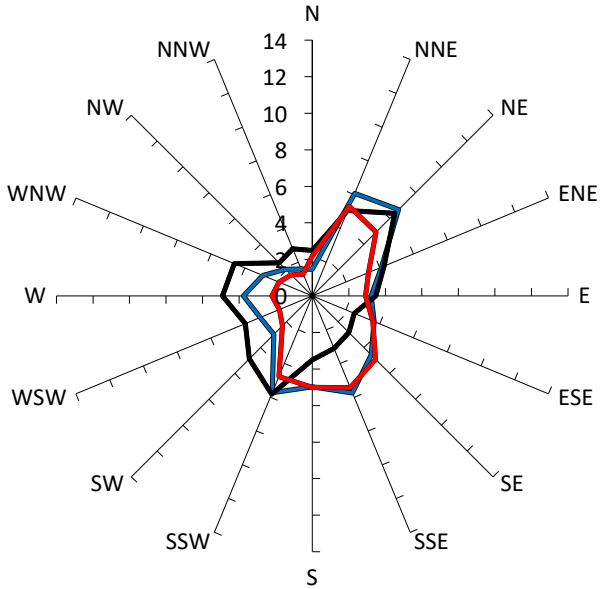
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	9%	21
—	With inclusion of Existing and Retained Trees	1%	18
—			
—			
—			
—			
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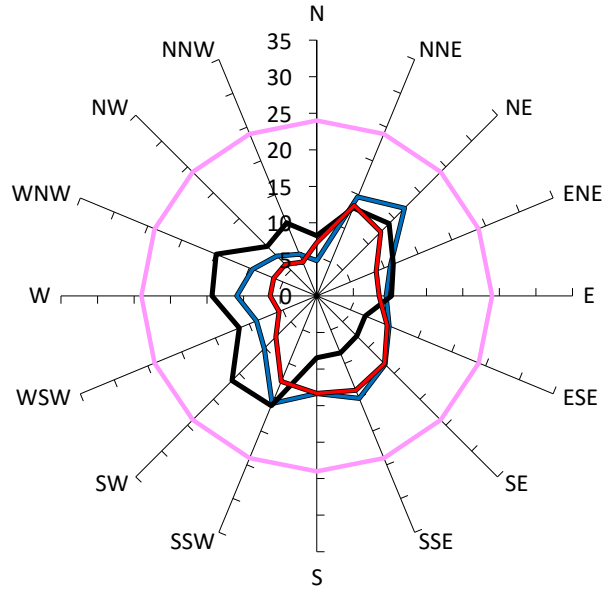
Results for Point 100

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

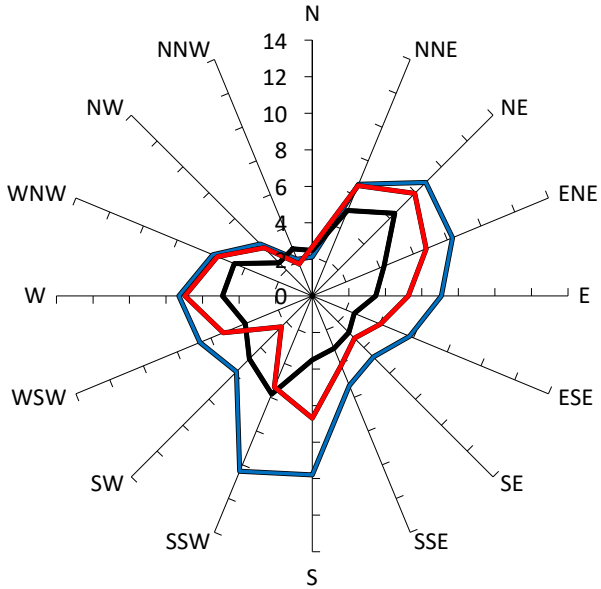
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	17
—	Existing Site	1%	16
—	With inclusion of Existing and Retained Trees	0%	14
—			
—			
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—			
—			

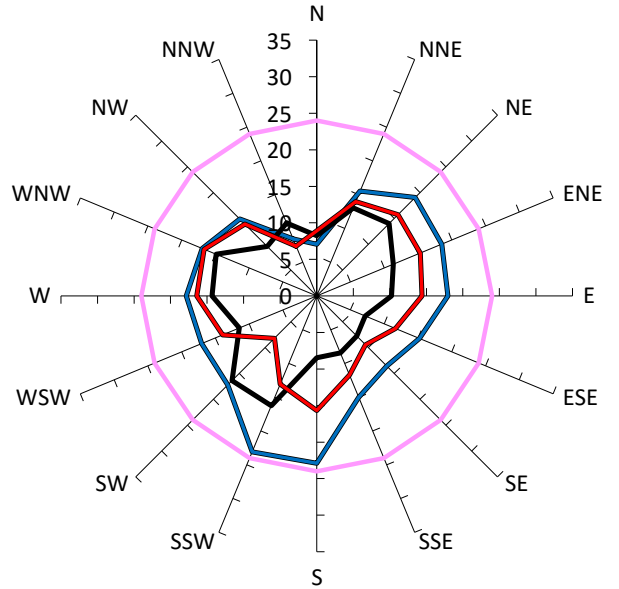
Results for Point 101

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

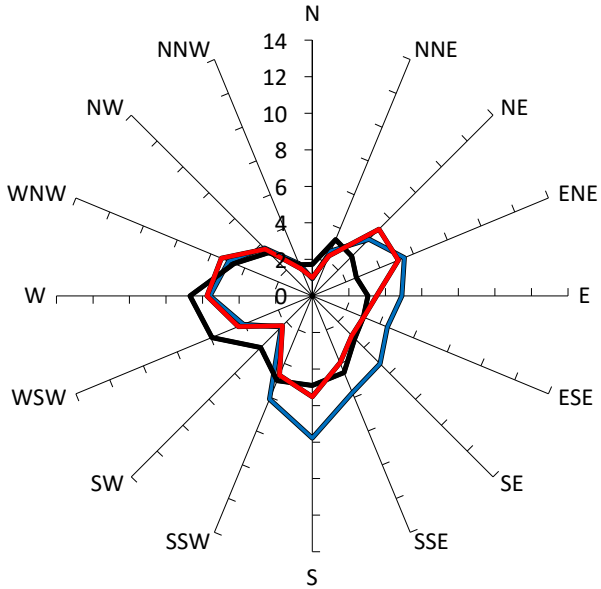
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	14%	23
—	Existing Site	1%	16
—	With inclusion of Existing and Retained Trees	3%	17
—			
—			
—			
—			
—			

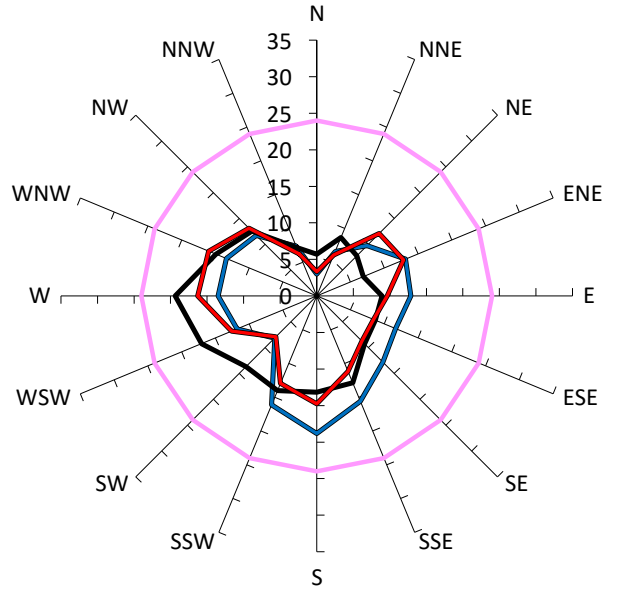
Results for Point 102

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

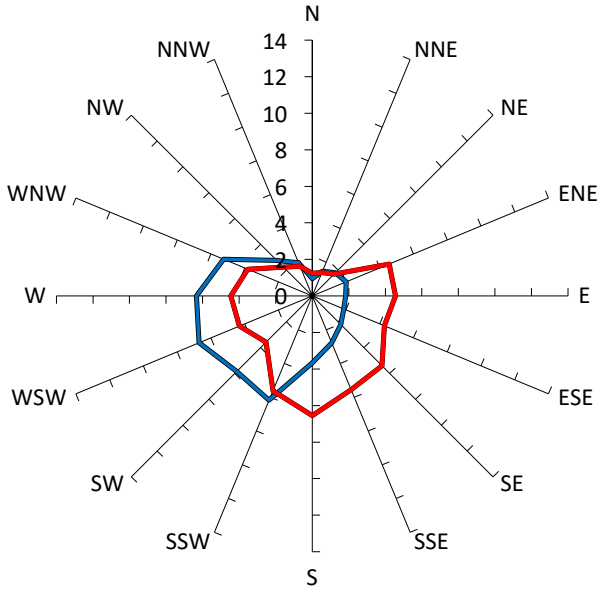
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	2%	19
—	Existing Site	1%	19
—	With inclusion of Existing and Retained Trees	0%	16
—			
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—			
—			

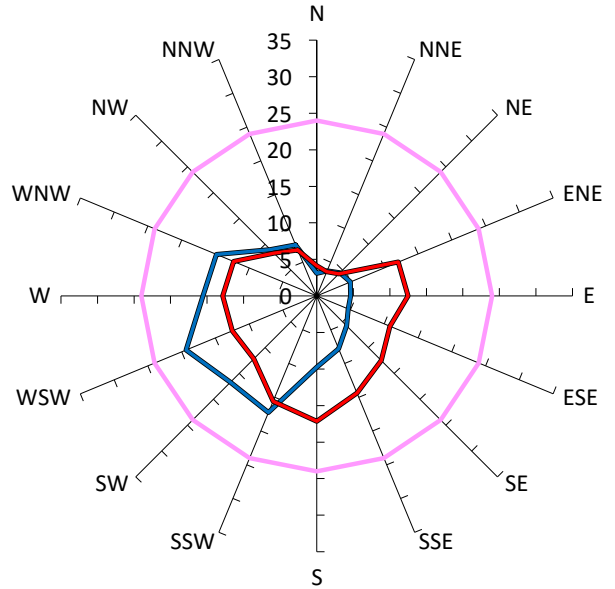
Results for Point 103

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

2%

19

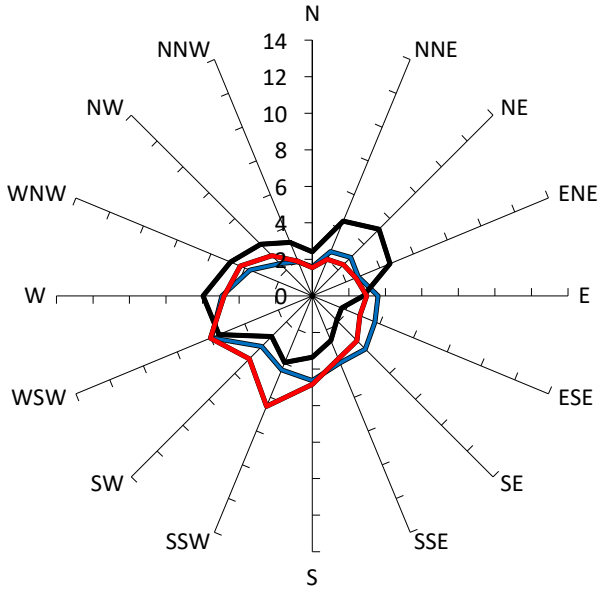
— With inclusion of Existing and Retained Trees

1%

17

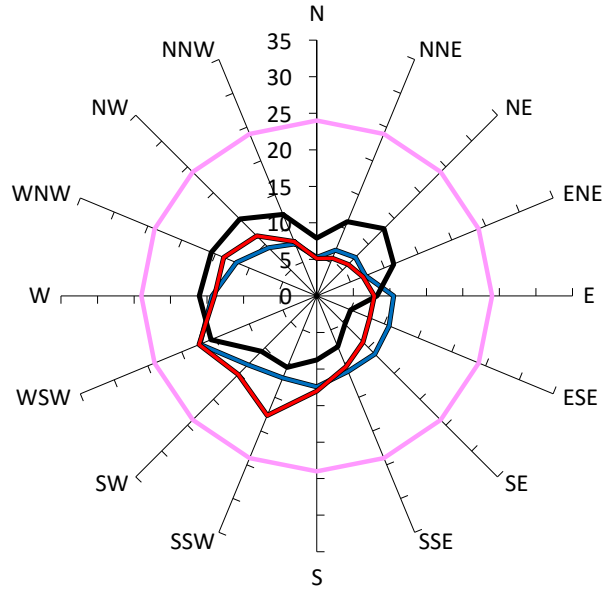
Results for Point 104

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

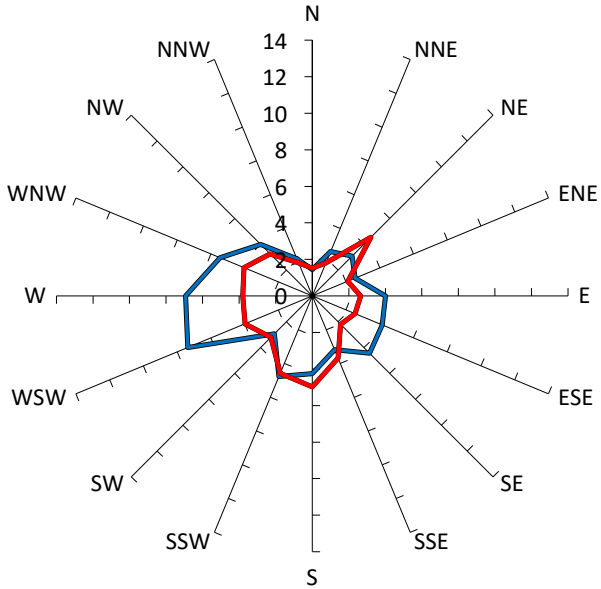
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	0%	17
Existing Site	1%	16
With inclusion of Existing and Retained Trees	1%	18

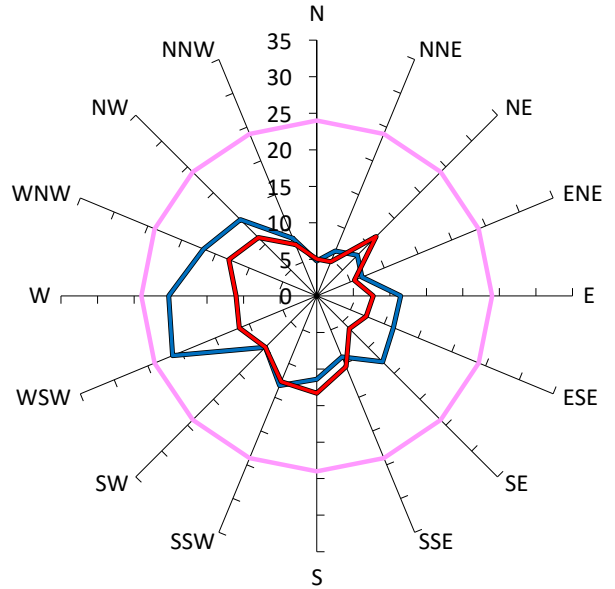
Results for Point 105

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

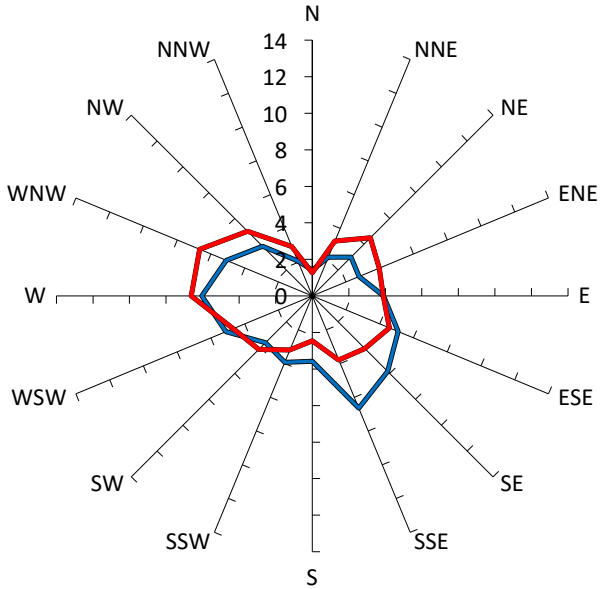
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	2%	21
—	With inclusion of Existing and Retained Trees	0%	13
—			
—			
—			
—			
—			

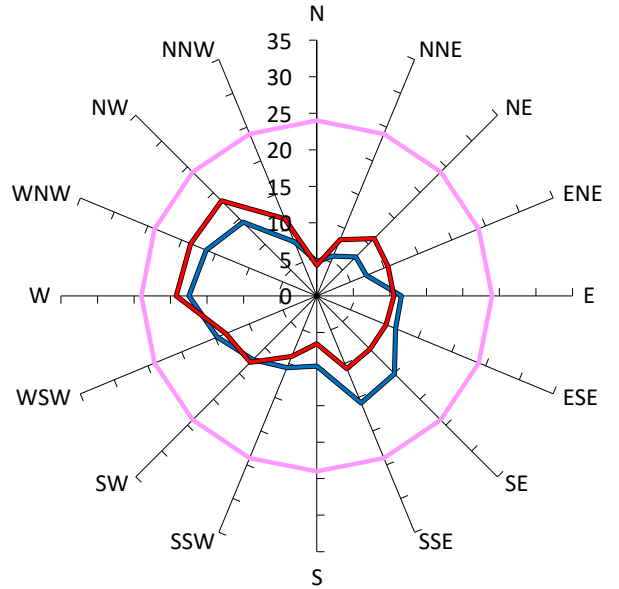
Results for Point 106

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

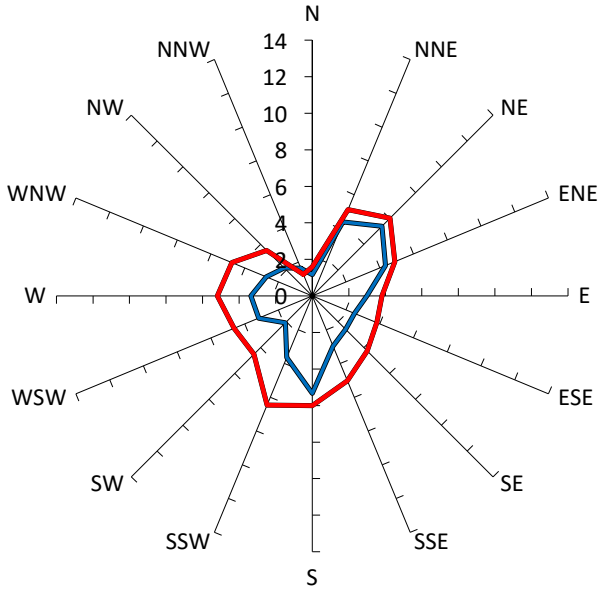
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	17
—			
—	With inclusion of Existing and Retained Trees	1%	19
—			
—			
—			
—			
—			

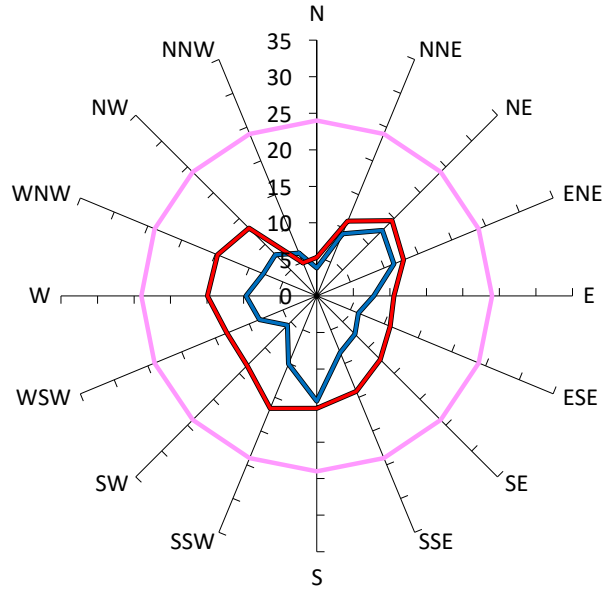
Results for Point 107

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

0%

14

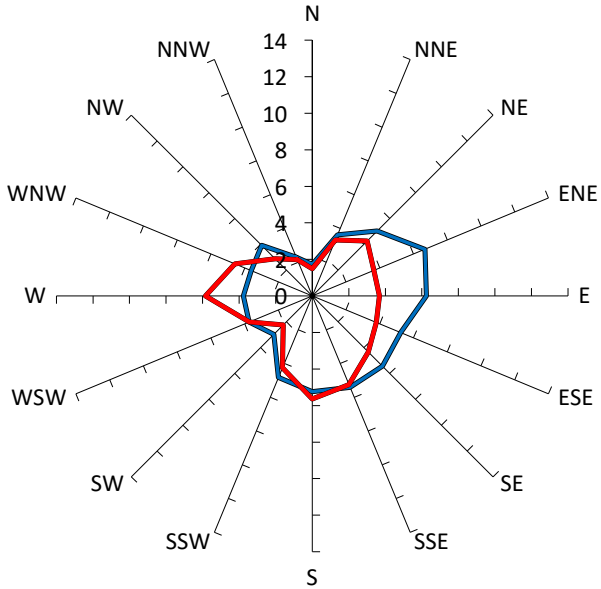
— With inclusion of Existing and Retained Trees

1%

17

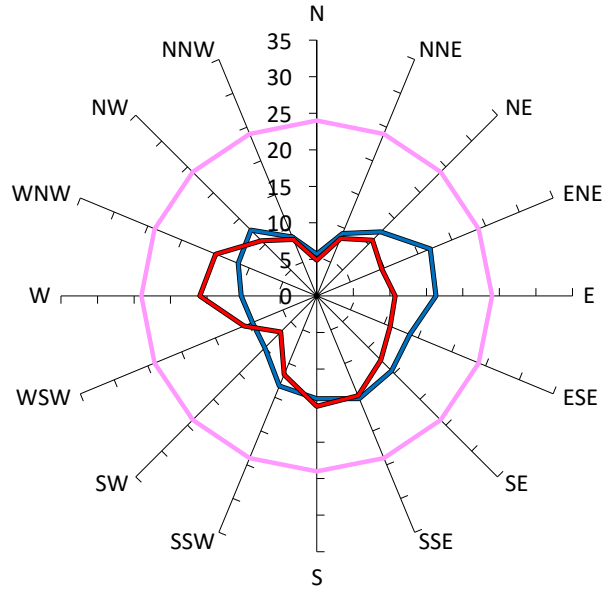
Results for Point 108

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

1%

17

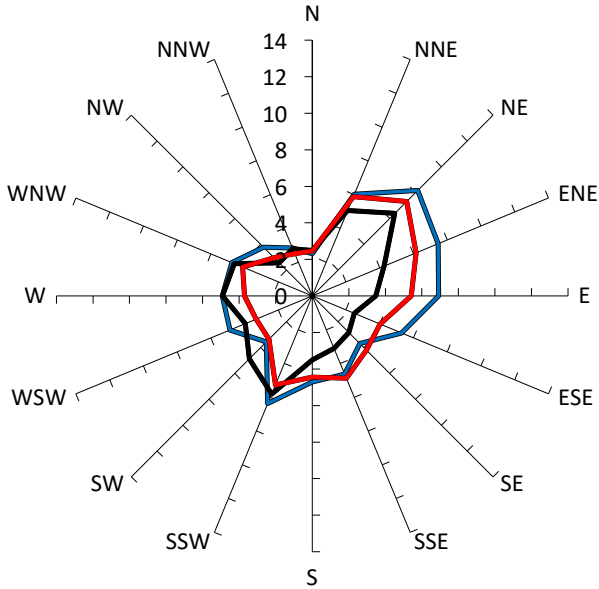
— With inclusion of Existing and Retained Trees

0%

16

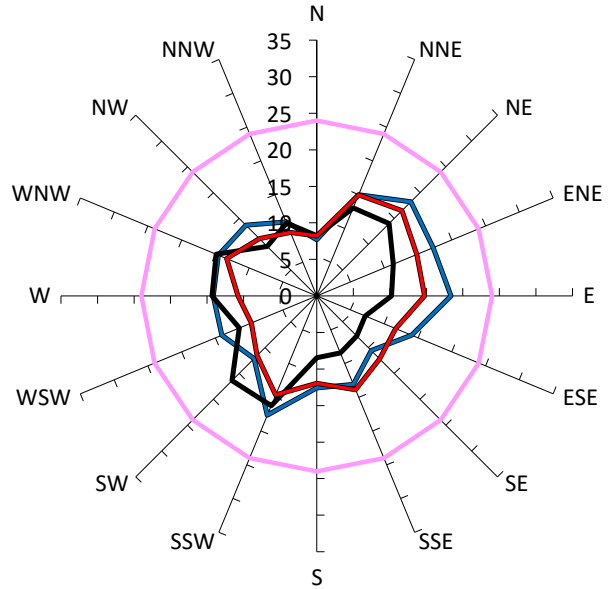
Results for Point 109

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

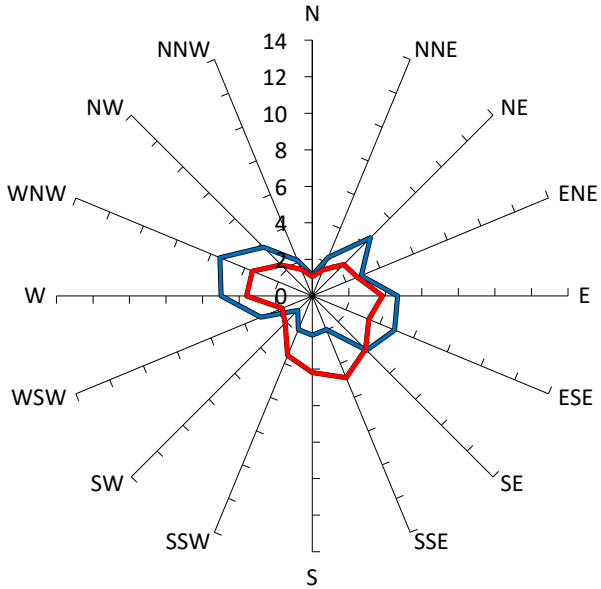
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	3%	18
—	Existing Site	1%	16
—	With inclusion of Existing and Retained Trees	1%	17
—			
—			
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—			
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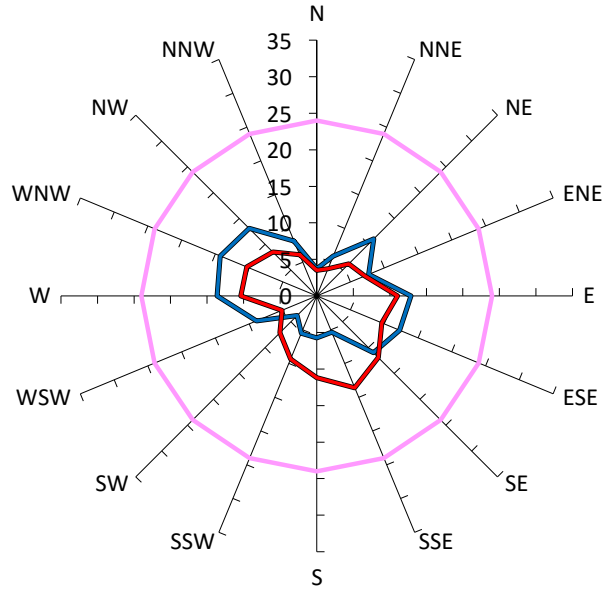
Results for Point 110

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).

5%

24

— With development as proposed, no vegetation

0%

14

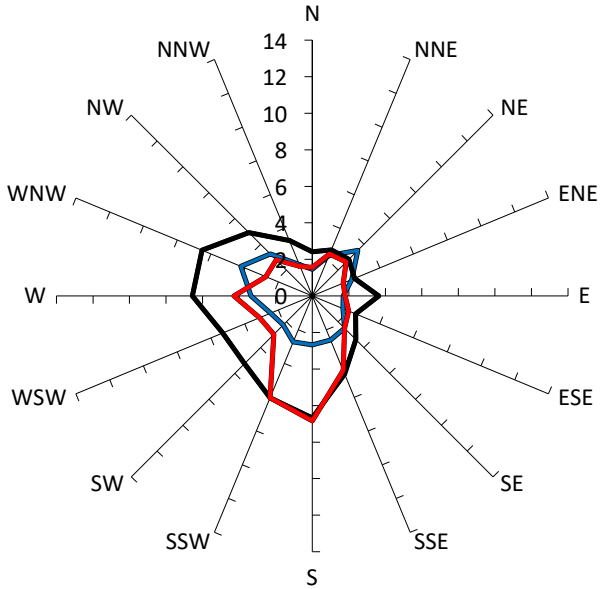
— With inclusion of Existing and Retained Trees

0%

14

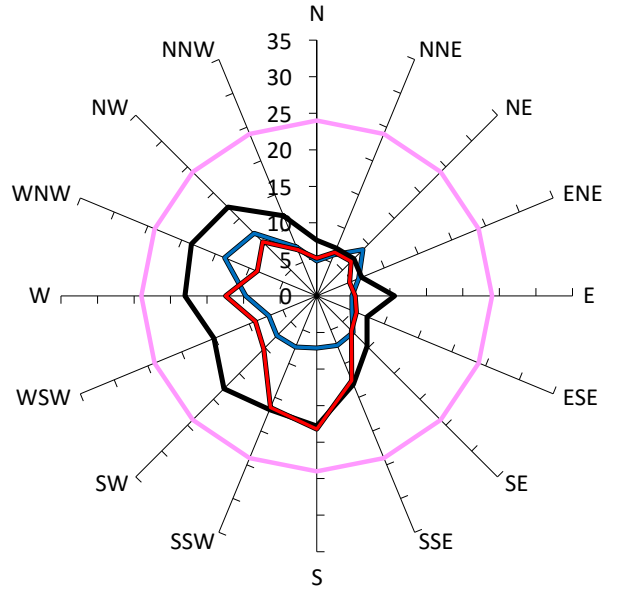
Results for Point 111

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

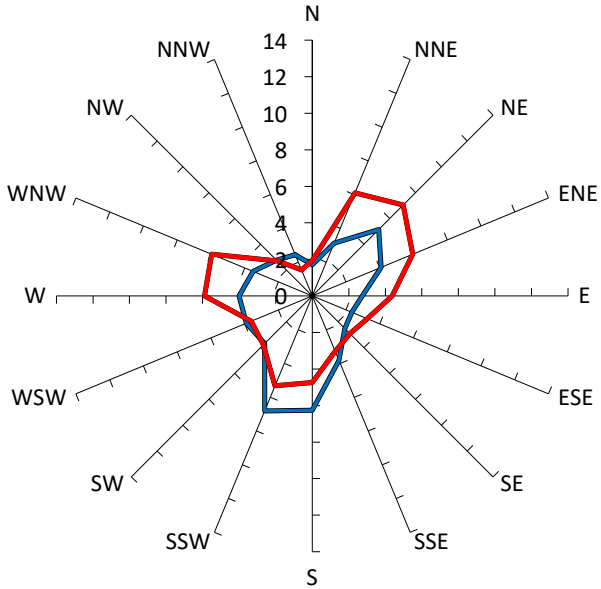
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	0%	14
—	Existing Site	2%	19
—	With inclusion of Existing and Retained Trees	1%	18
—			
—			
—			
—			
—			

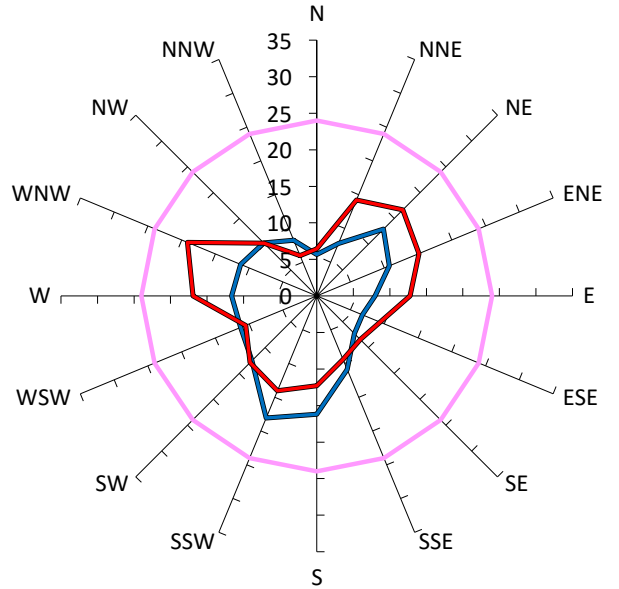
Results for Point 112

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

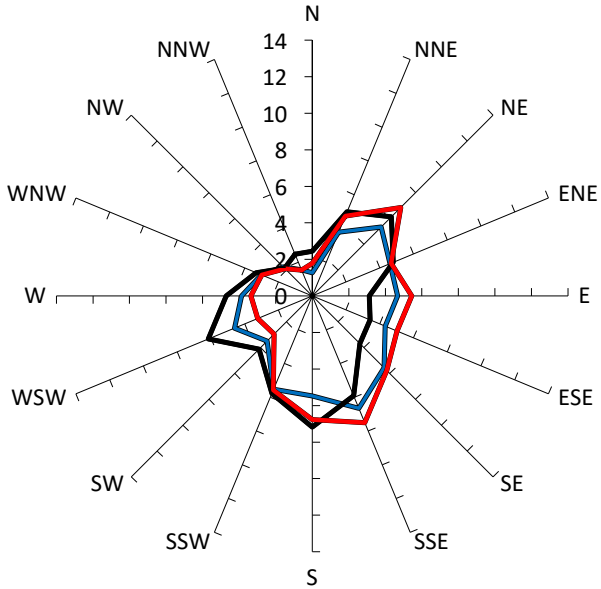
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	1%	18
With inclusion of Existing and Retained Trees	1%	19

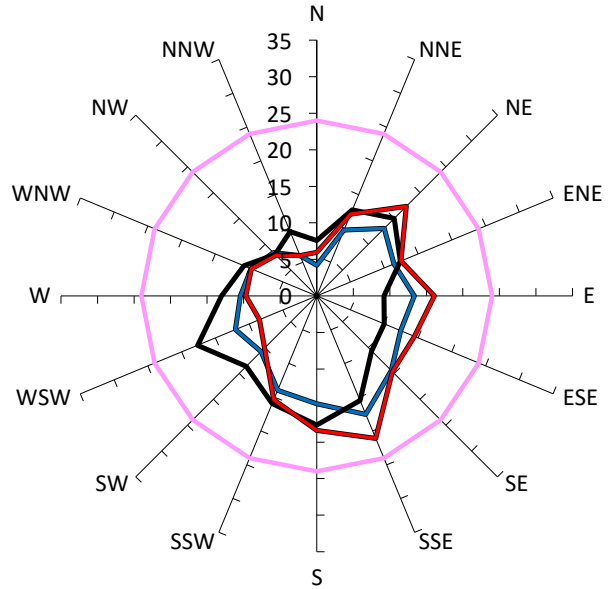
Results for Point 113

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

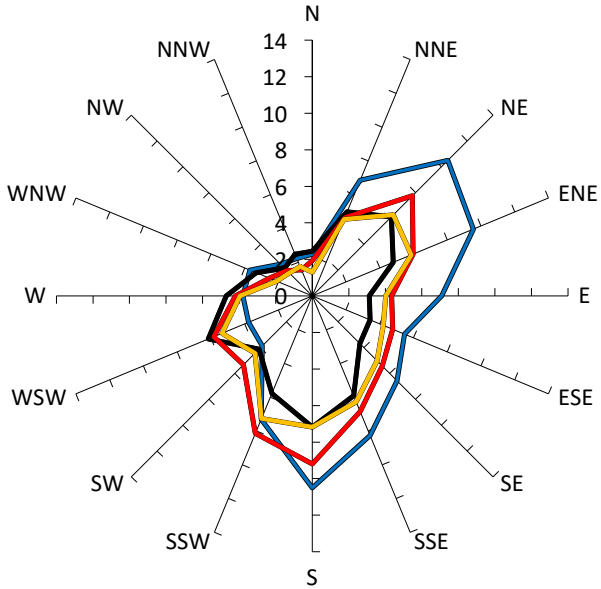
GEM Prob of Exceed %

Peak Gust m/s

Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
With development as proposed, no vegetation	1%	18
Existing Site	1%	18
With inclusion of Existing and Retained Trees	2%	21

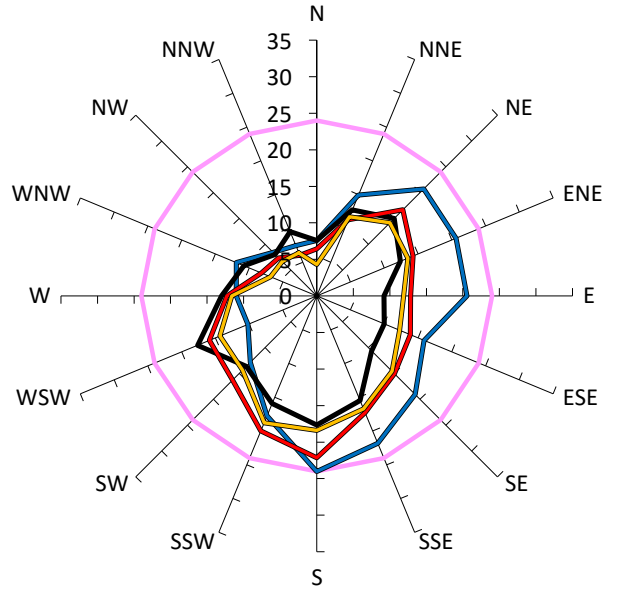
Results for Point 114

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

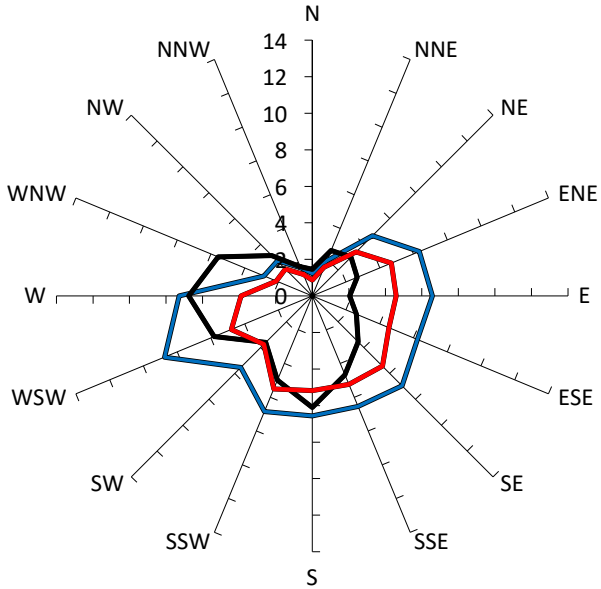
GEM Prob of Exceed %

Peak Gust m/s

— Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
— With development as proposed, no vegetation	19%	24
— Existing Site	1%	18
— With inclusion of Existing and Retained Trees	6%	22
— Awning along Eastern and part of Southern Façade and chamfer of Building Z5	2%	19
—		
—		
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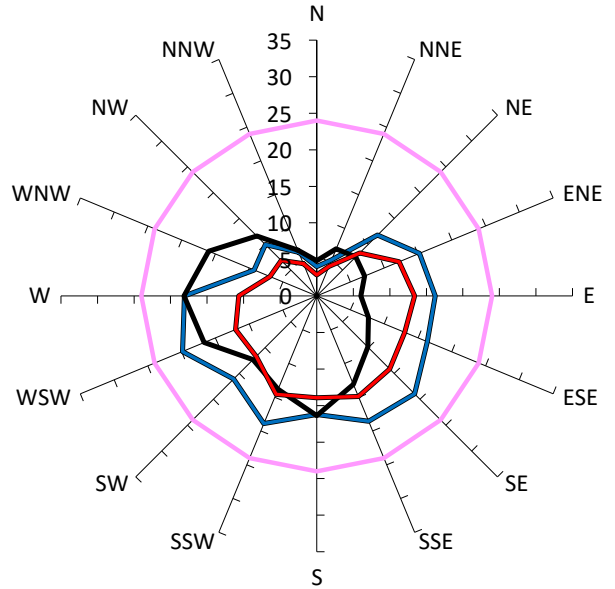
Results for Point 115

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

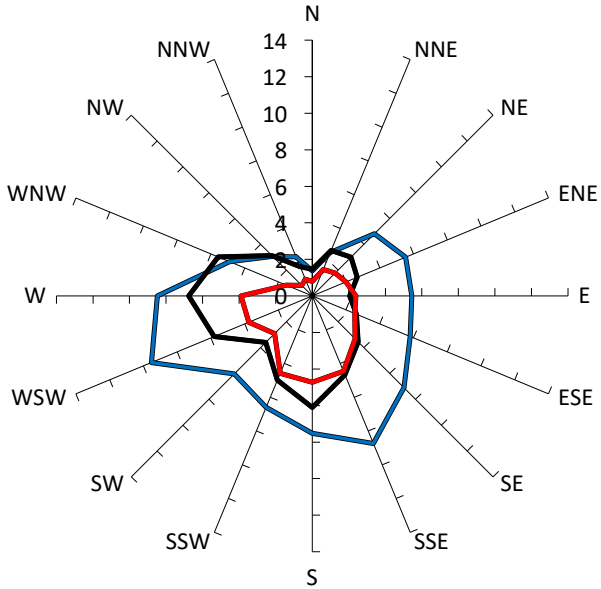
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	5%	20
—	Existing Site	1%	18
—	With inclusion of Existing and Retained Trees	0%	15
—			
—			
—			
—			
—			

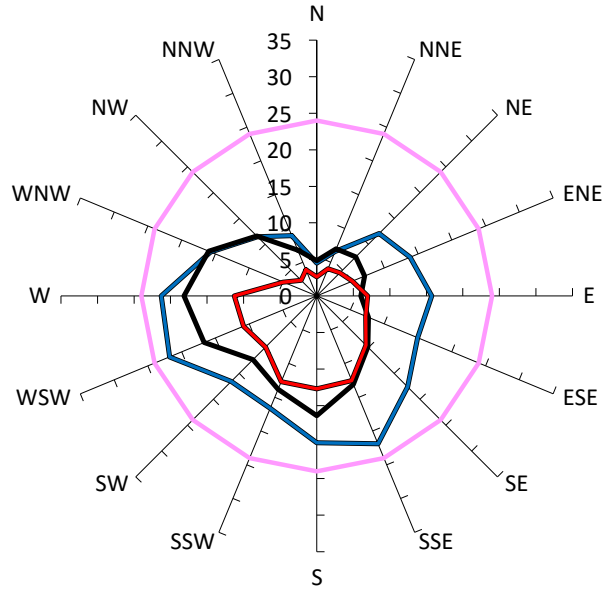
Results for Point 116

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

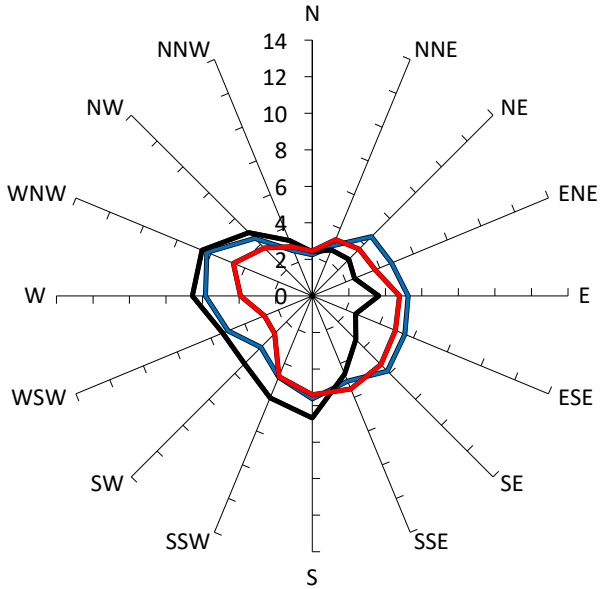
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	9%	22
—	Existing Site	1%	18
—	With inclusion of Existing and Retained Trees	0%	13
—			
—			
—			
—			
—			

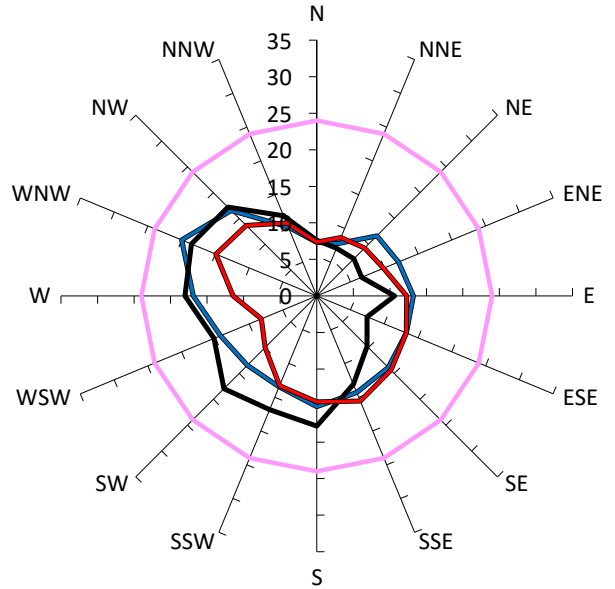
Results for Point 117

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

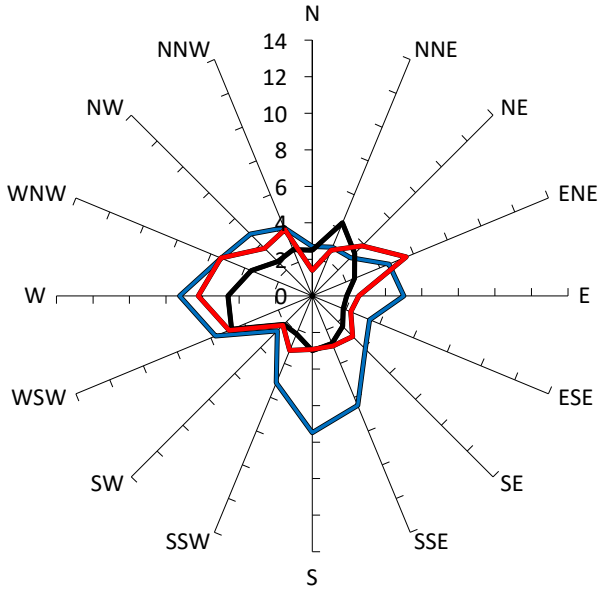
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	20
—	Existing Site	2%	19
—	With inclusion of Existing and Retained Trees	0%	16
—			
—			
—			
—			
—			

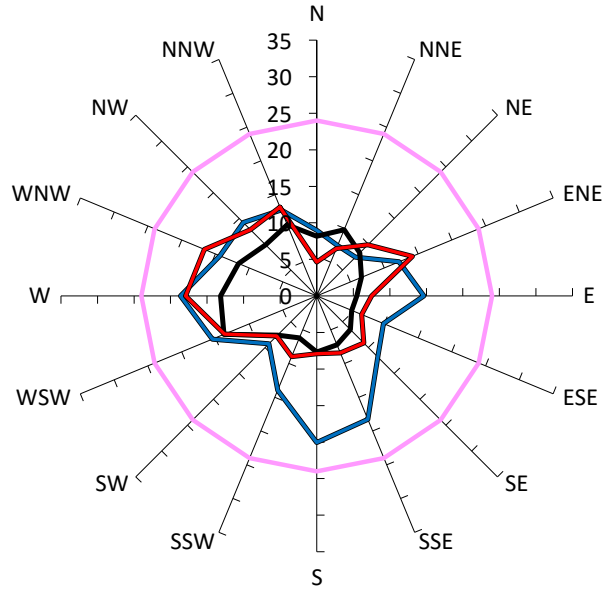
Results for Point 118

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	2%	20
—	Existing Site	0%	14
—	With inclusion of Existing and Retained Trees	1%	18

—

—

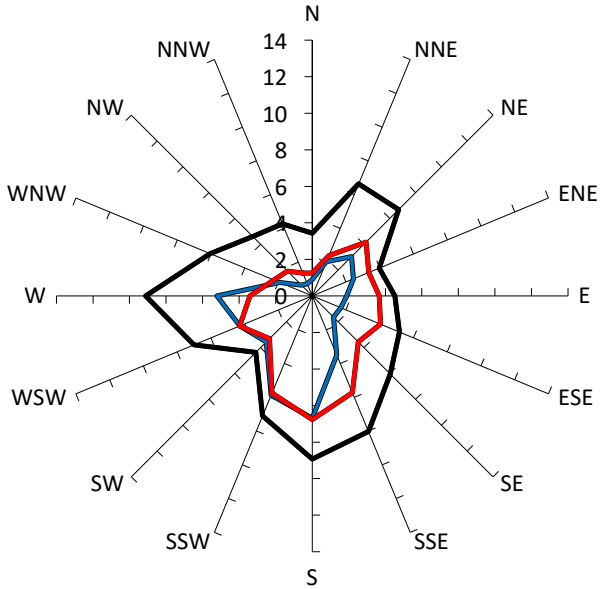
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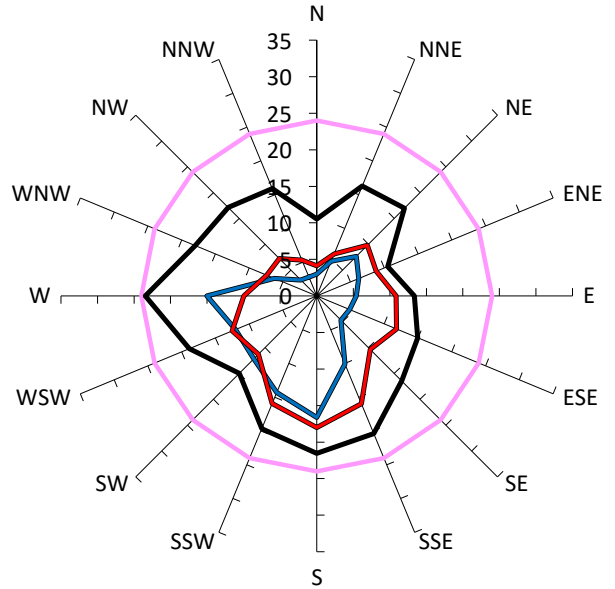
Results for Point 119

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

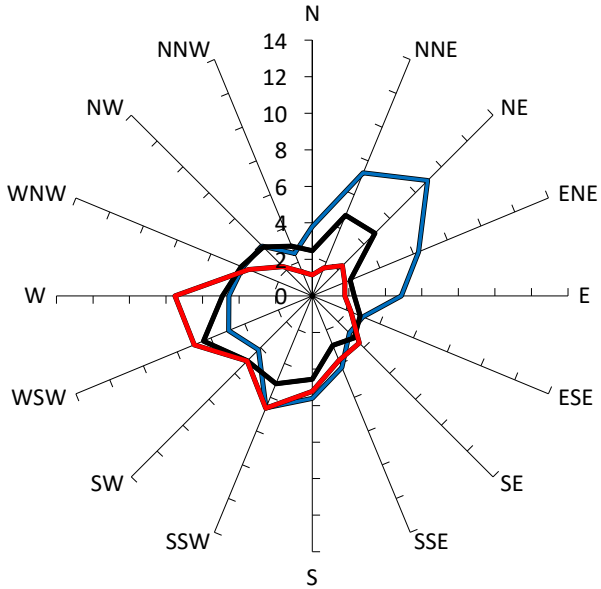
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	17
—	Existing Site	8%	23
—	With inclusion of Existing and Retained Trees	1%	18
—			
—			
—			
—			
—			

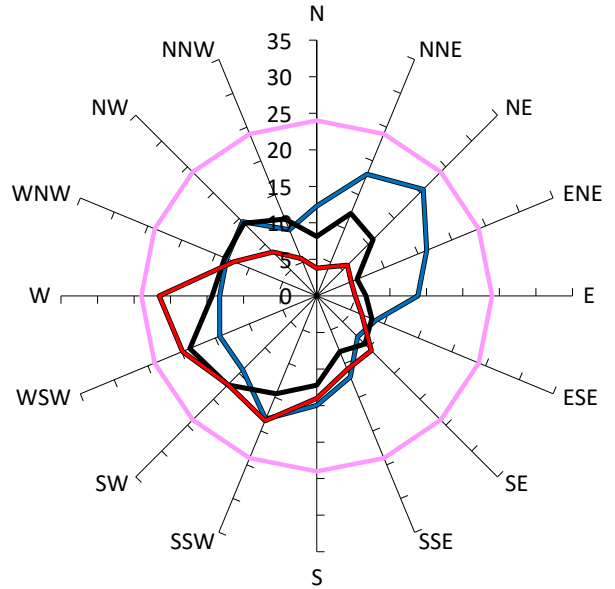
Results for Point 120

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

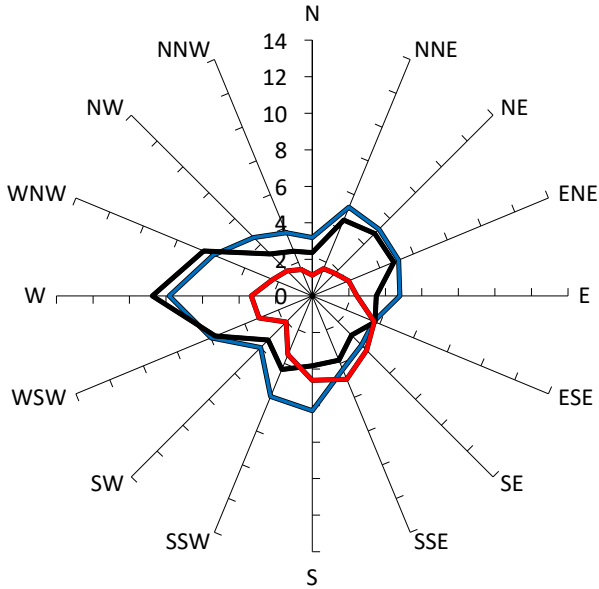
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	4%	21
—	Existing Site	1%	19
—	With inclusion of Existing and Retained Trees	2%	22
—			
—			
—			
—			
—			

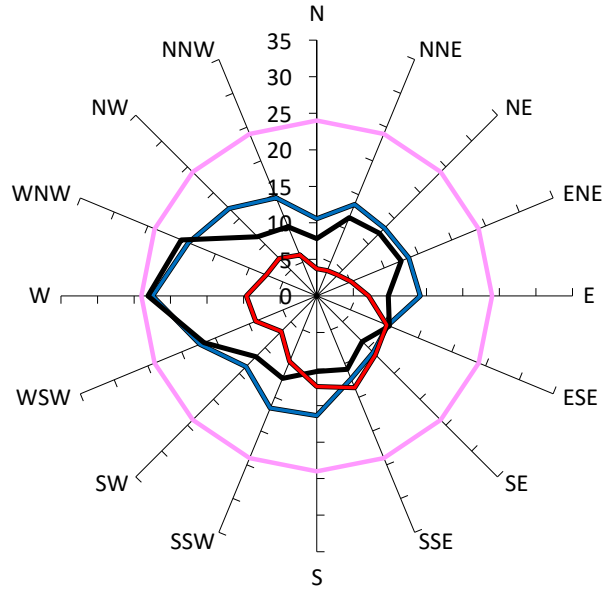
Results for Point 121

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

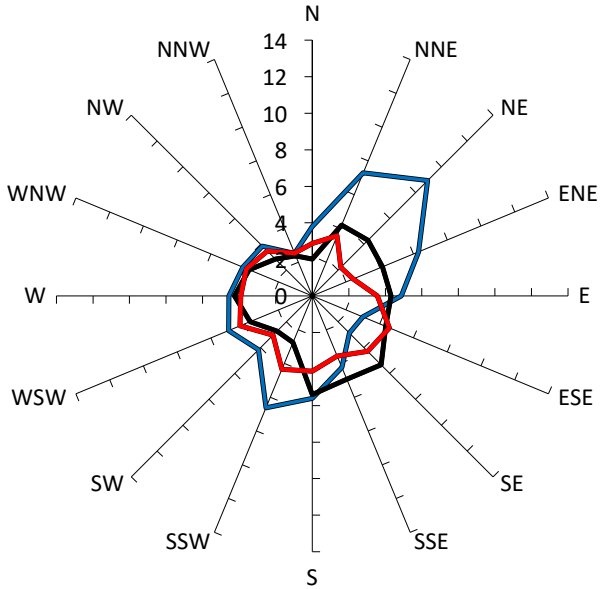
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	2%	22
—	Existing Site	3%	23
—	With inclusion of Existing and Retained Trees	0%	14

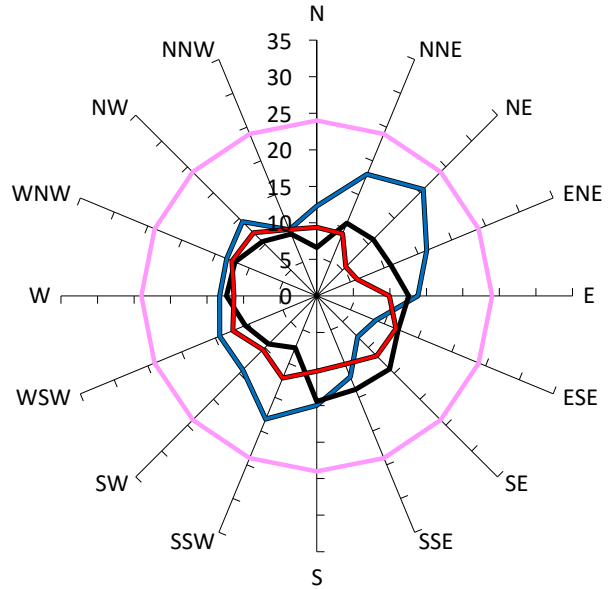
Results for Point 122

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

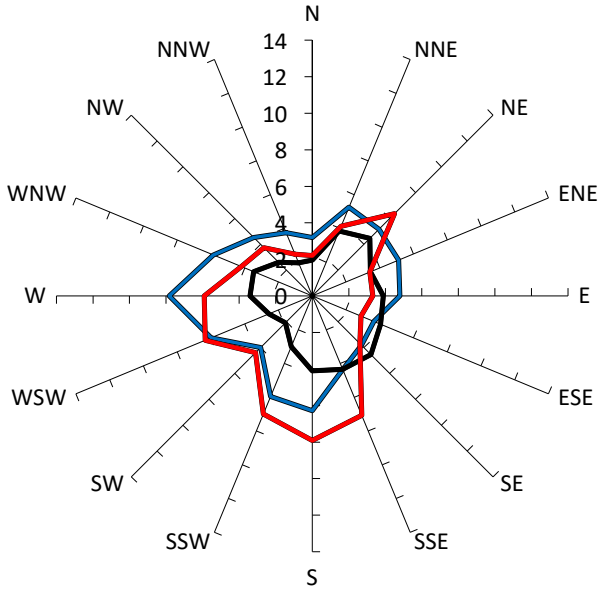
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	4%	21
—	Existing Site	0%	14
—	With inclusion of Existing and Retained Trees	0%	13
—			
—			
—			
—			
—			

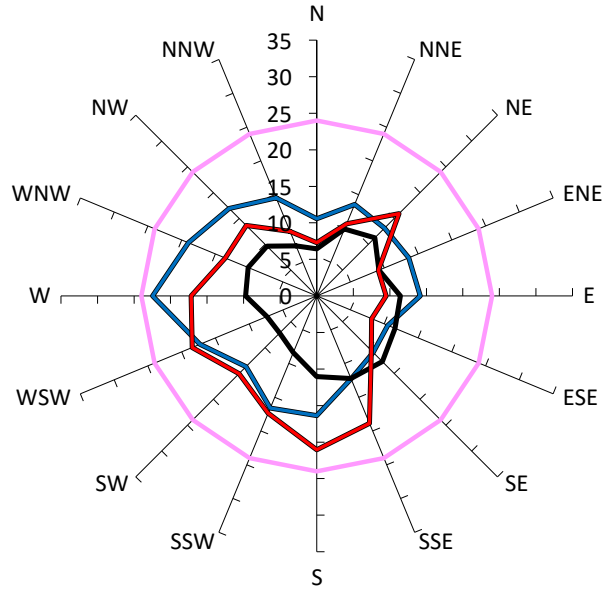
Results for Point 123

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

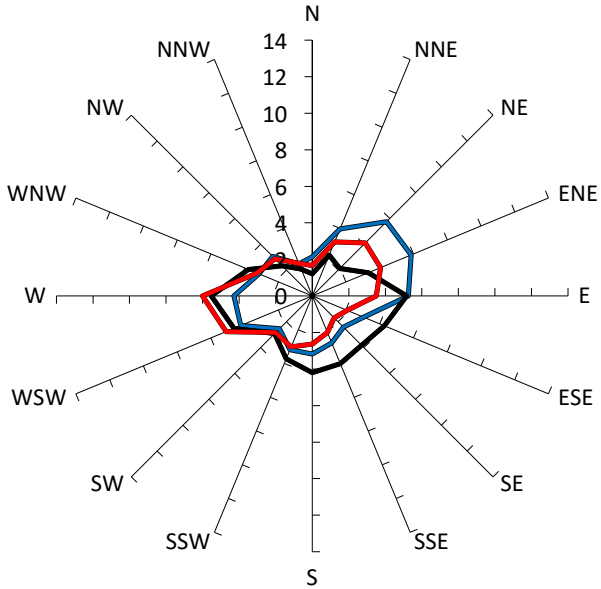
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	2%	22
—	Existing Site	0%	13
—	With inclusion of Existing and Retained Trees	3%	21
—			
—			
—			
—			
—			

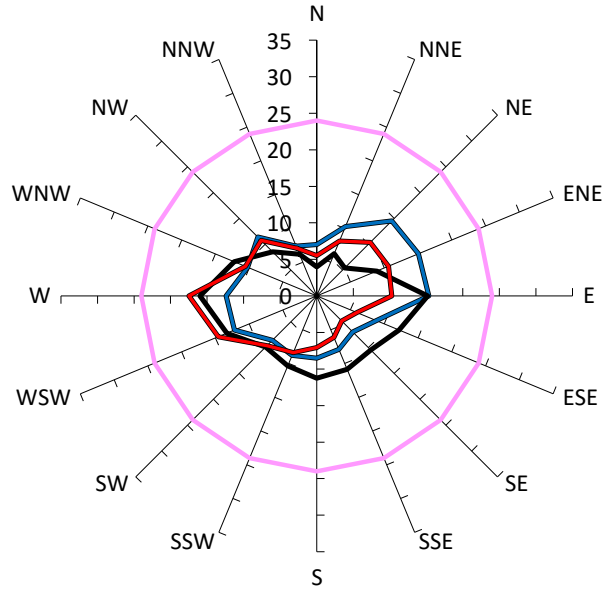
Results for Point 124

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

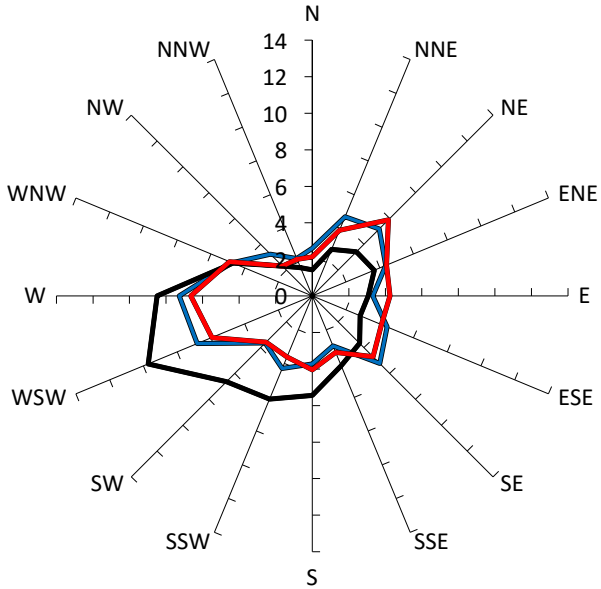
GEM Prob of Exceed %

Peak Gust m/s

—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	0%	15
—	Existing Site	0%	16
—	With inclusion of Existing and Retained Trees	0%	17
—			
—			
—			
—			
—			

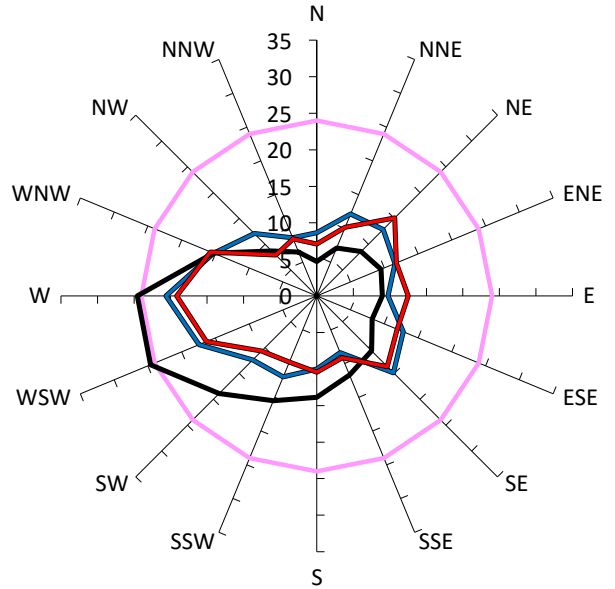
Results for Point 125

Gust Equivalent Mean (m/s)



Comfort Criteria: 8m/s with 5% probability of exceedence

Maximum Gust (m/s)



Safety Limit: 24m/s

Description

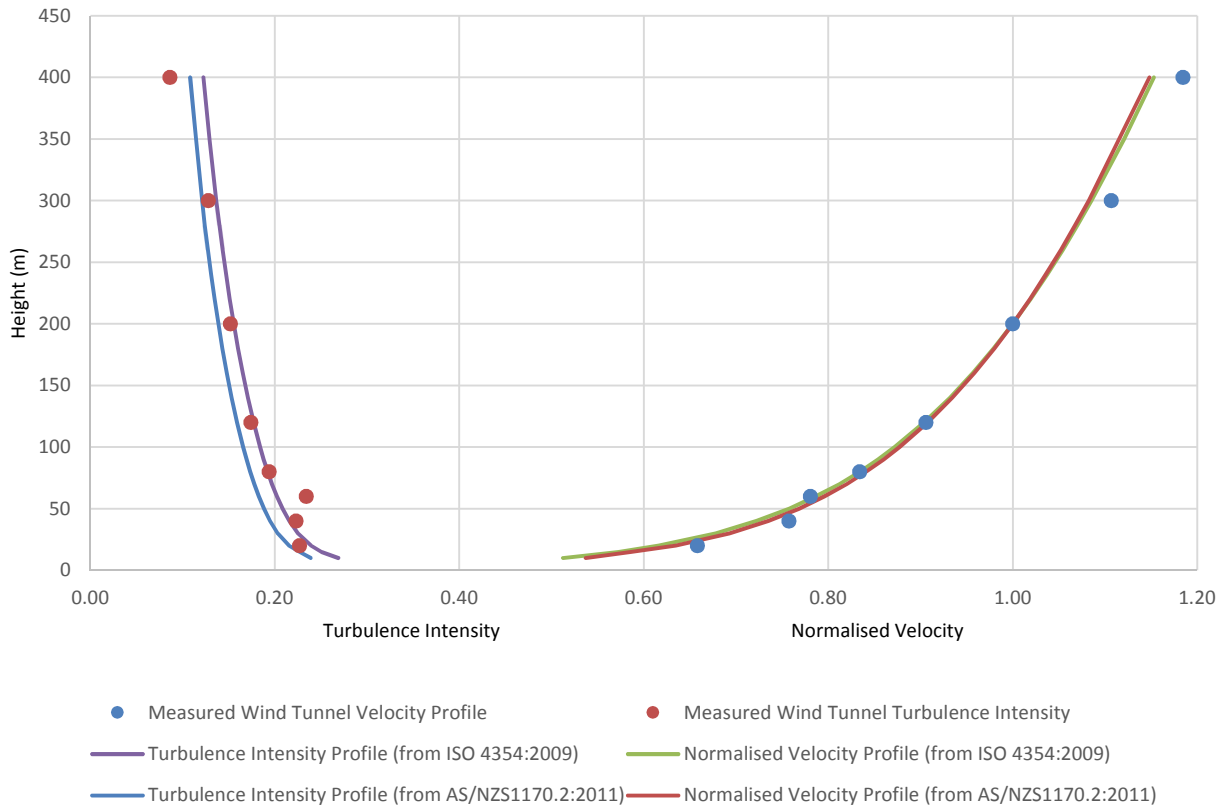
GEM Prob of Exceed %

Peak Gust m/s

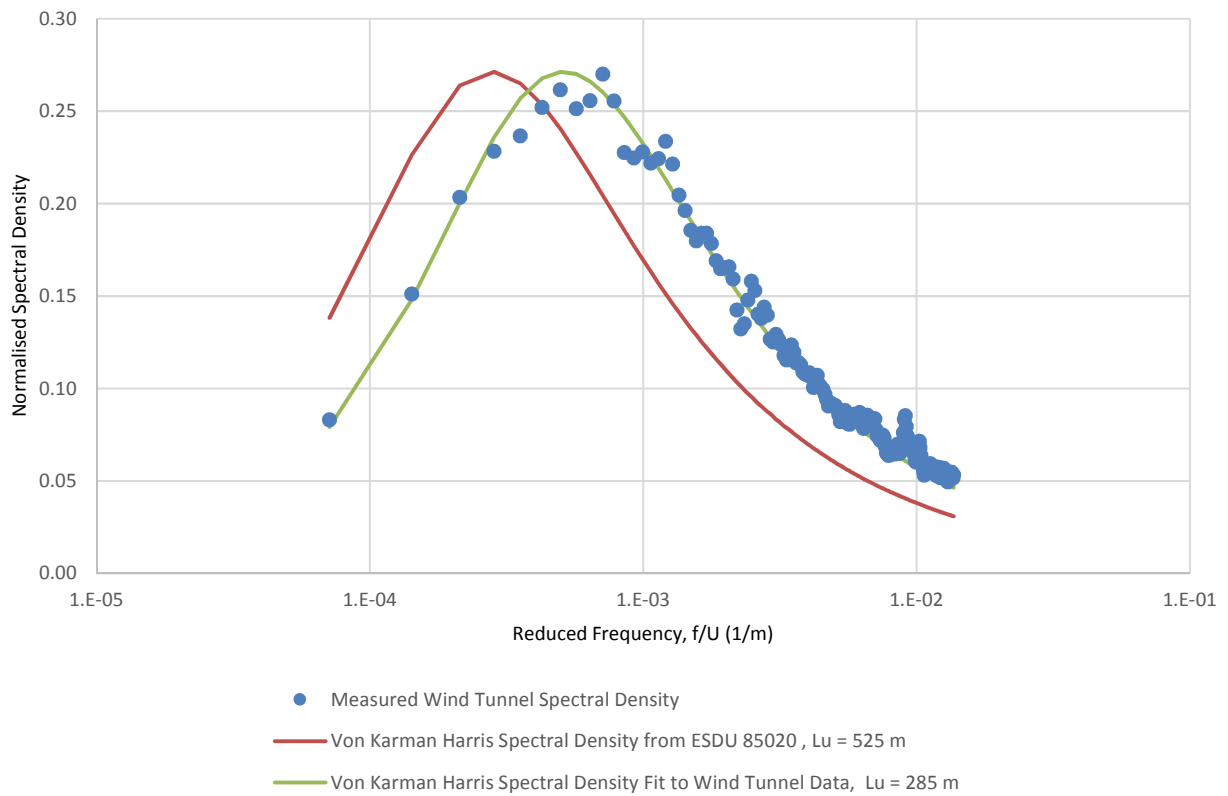
—	Criterion: Comfortable Walking Activities (8m/s). Safety Limit (24m/s).	5%	24
—	With development as proposed, no vegetation	1%	21
—	Existing Site	6%	25
—	With inclusion of Existing and Retained Trees	1%	19
—			
—			
—			
—			
—			

APPENDIX B - VELOCITY AND TURBULENCE INTENSITY PROFILES

Mean Velocity and Turbulence Intensity for Suburban/Forest Terrain ($0.2m < z_0 < 0.3m$) (TC3) at a 1:400 Scale



Longitudinal Spectra Density for Suburban/Forest Terrain ($0.2m < z_0 < 0.3m$) (TC3) at a 1:400 Scale



APPENDIX C - PUBLISHED ENVIRONMENTAL CRITERIA

C.1 Wind Effects on People

The acceptability of wind in an area is dependent upon the use of the area. For example, people walking or window-shopping will tolerate higher wind speeds than those seated at an outdoor restaurant. Quantifying wind comfort has been the subject of much research and many researchers, such as A.G. Davenport, T.V. Lawson, W.H. Melbourne, and A.D. Penwarden, have published criteria for pedestrian comfort for pedestrians in outdoor spaces for various types of activities. This section discusses and compares the various published criteria.

C.1.1 A.D. Penwarden (1973) Criteria for Mean Wind Speeds

A.D. Penwarden (1973) developed a modified version of the Beaufort scale which describes the effects of various wind intensities on people. Table C.1 presents the modified Beaufort scale. Note that the effects listed in this table refers to wind conditions occurring frequently over the averaging time (a probability of occurrence exceeding 5%). Higher ranges of wind speeds can be tolerated for rarer events.

Table C.1: Summary of Wind Effects on People (A.D. Penwarden, 1973)

Type of Winds	Beaufort Number	Hourly Mean Wind Speed (m/s)	Effects
Calm	0	0 - 0.25	
Calm, light air	1	0.25 - 1.55	No noticeable wind
Light breeze	2	1.55 - 3.35	Wind felt on face
Gentle breeze	3	3.35 - 5.45	Hair is disturbed, clothing flaps, newspapers difficult to read
Moderate breeze	4	5.45 - 7.95	Raises dust, dry soil and loose paper, hair disarranged
Fresh breeze	5	7.95 - 10.75	Force of wind felt on body, danger of stumbling
Strong breeze	6	10.75 - 13.85	Umbrellas used with difficulty, hair blown straight, difficult to walk steadily, wind noise on ears unpleasant
Near gale	7	13.85 - 17.15	Inconvenience felt when walking
Gale	8	17.15 - 20.75	Generally impedes progress, difficulty balancing in gusts
Strong gale	9	20.75 - 24.45	People blown over

C.1.2 A.G. Davenport (1972) Criteria for Mean Wind Speeds

A.G. Davenport (1972) also determined a set of criteria in terms of the Beaufort scale and for various return periods. Table C.2 presents a summary of the criteria based on a probability of exceedance of 5%.

Table C.2: Criteria by A.G. Davenport (1972)

Classification	Activities	5% exceedance Mean Wind Speed (m/s)
Walking Fast	Acceptable for walking, main public accessways.	7.5 - 10.0
Strolling, Skating	Slow walking, etc.	5.5 - 7.5
Short Exposure Activities	Generally acceptable for walking & short duration stationary activities such as window-shopping, standing or sitting in plazas.	3.5 - 5.5
Long Exposure Activities	Generally acceptable for long duration stationary activities such as in outdoor restaurants & theatres and in parks.	0 - 3.5

C.1.3 T.V. Lawson (1975) Criteria for Mean Wind Speeds

In 1973, T.V. Lawson, while referring to the Beaufort wind speeds of A.D. Penwarden (1973) (as listed in Table C.1), quoted that a Beaufort 4 wind speed would be acceptable if it is not exceeded for more than 4% of the time, and that a Beaufort 6 wind speed would be unacceptable if it is exceeded more than 2% of the time. Later, in 1975, T.V. Lawson presented a set of criteria very similar to those presented in A.G. Davenport (1972) (as listed in Table C.2). These criteria are presented in Table C.3 and Table C.4 for safety and comfort respectively.

Table C.3: Safety Criteria by T.V. Lawson (1975)

Classification	Activities	Annual Mean Wind Speed (m/s)
Safety (all weather areas)	Accessible by the general public.	0 - 15
Safety (fair weather areas)	Private areas, balconies/terraces, etc.	0 - 20

Table C.4: Comfort Criteria by T.V. Lawson (1975)

Classification	Activities	5% exceedance Mean Wind Speed (m/s)
Business Walking	Objective Walking from A to B.	8 - 10
Pedestrian Walking	Slow walking, etc.	6 - 8
Short Exposure Activities	Pedestrian standing or sitting for short times.	4 - 6
Long Exposure Activities	Pedestrian sitting for a long duration.	0 - 4

C.1.4 W.H. Melbourne (1978) Criteria for Gust Wind Speeds

W.H. Melbourne (1978) introduced a set of criteria for the assessment of environmental wind conditions that were developed for a temperature range of 10oC to 30oC and for people suitably dressed for outdoor conditions. These criteria are presented in Table C.5 and are based on maximum gust wind speeds with a probability of exceedance of once per year.

Table C.5: Criteria by W.H. Melbourne (1978)

Classification	Human Activities	Annual Gust Wind Speed (m/s)
Limit for Safety	Completely unacceptable: people likely to get blown over.	23
Marginal	Unacceptable as main public accessways.	16 - 23
Comfortable Walking	Acceptable for walking, main public accessways	13 - 16
Short Exposure Activities	Generally acceptable for walking & short duration stationary activities such as window-shopping, standing or sitting in plazas.	10 - 13
Long Exposure Activities	Generally acceptable for long duration stationary activities such as in outdoor restaurants & theatres and in parks.	0 - 10

C.2 Comparison of the Published Wind Speed Criteria

W.H. Melbourne (1978) presented a comparison of the criteria of various researchers on a probabilistic basis. Figure C.1 presents the results of this comparison, and indicates that the criteria of W.H. Melbourne (1978) are comparatively quite conservative. This conclusion was also observed by A.W. RoYes (2007) when undertaking on-site remedial studies. The results of A.W. RoYes (2007) concluded that the criteria by W.H. Melbourne (1978) generally overstates the wind effects in a typical urban setting due to the assumption of a fixed 15% turbulence intensity for all areas. It was observed in A.W. RoYes (2007) that this value tends to be at the lower end of the range of turbulence intensities, and in an urban setting the range of the minimum turbulence intensities is typically in the range of 20% to 60%.

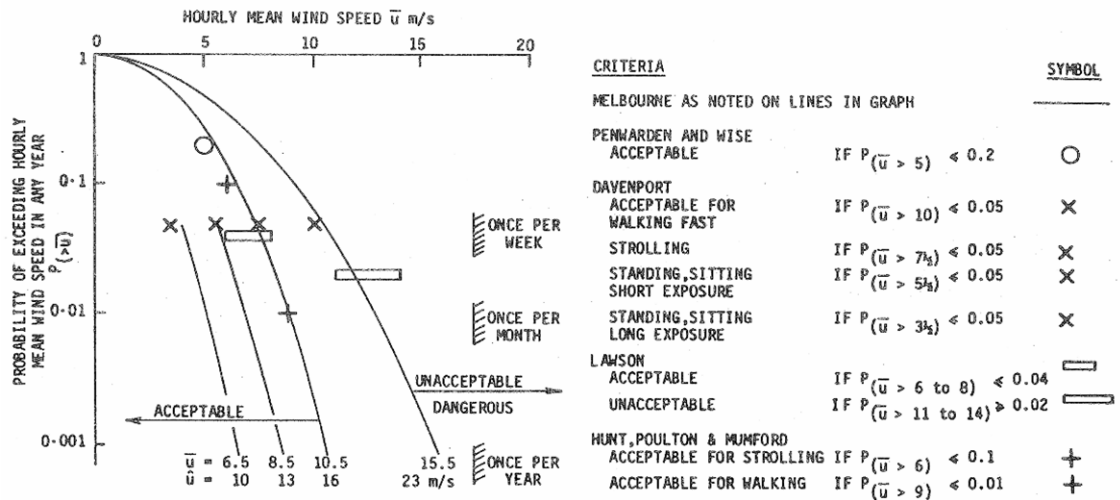


Figure C.1: Comparison of Various Mean and Gust Wind Environment Criteria, assuming 15% turbulence and a Gust Factor of 1.5 (W.H. Melbourne, 1978)

C.3 References relating to Pedestrian Comfort Criteria

Davenport, A.G., 1972, "An approach to human comfort criteria for environmental conditions". Colloquium on Building Climatology, Stockholm.

Davenport, A.G., 1977, "The prediction of risk under wind loading", 2nd International Conference on Structural Safety and Reliability, Munich, Germany, pp511-538.

Lawson, T.V., 1973, "The wind environment of buildings: a logical approach to the establishment of criteria". Bristol University, Department of Aeronautical Engineering.

Lawson, T.V., 1975, "The determination of the wind environment of a building complex before construction". Bristol University, Department of Aeronautical Engineering.

Melbourne, W.H., 1978, "Criteria for Environmental Wind Conditions". Journal of Wind Engineering and Industrial Aerodynamics, vol. 3, pp241-249.

Penwarden, A.D. (1973). "Acceptable Wind Speeds in Towns", Building Science, vol. 8: pp259-267

Penwarden, A.D., Wise A.F.E., 1975, "Wind Environment Around Buildings". Building Research Establishment Report, London.

RoYes, A.W., 2007, "Comparison of Wind Environment Criteria against Field Observations". 12th International Conference of Wind Engineering, Cairns, Australia.

APPENDIX D - DATA ACQUISITION

The wind tunnel testing procedures for this study were based on the guidelines set out in the Australasian Wind Engineering Society Quality Assurance Manual (AWES-QAM-1-2017), ASCE 7-10 (Chapter C31), and CTBUH (2013).

The wind speed measurements for the wind tunnel study were acquired as coefficients by Dantec hot-wire anemometers and converted to full-scale wind speeds using details of the regional wind climate obtained from an analysis of directional wind speed recordings from the local meteorological recording station(s).

D.1 Measurement of the Velocity Coefficients

The study model and proximity model were setup within the wind tunnel which was configured to the appropriate boundary layer profile, and the wind velocity measurements were monitored using Dantec hot-wire probe anemometers at selected critical outdoor locations. The anemometers were positioned at each study location at a full-scale height of approximately 1.5m above ground/slab level. The support of the probe was mounted such that the probe wire was vertical as much as possible to ensure that the measured wind speeds are independent of wind direction along the horizontal plane. In addition, care was taken in the alignment of the probe wire and in avoiding wall-heating effects.

Wind speed measurements were made in the wind tunnel for 16 wind directions, at 22.5° increments. The output from the hot-wire probes was obtained using a National Instruments 12-bit data acquisition card. The data was acquired for each wind direction using a sample rate of 1024Hz. The sample length was determined to produce a full-scale sample time that is sufficient for this type of study.

The mean, gust and standard deviation velocity coefficients were measured in the wind tunnel. The gust velocity coefficients were also derived for each wind direction from by the following relation:

$$\hat{C}_V = \bar{C}_V + g \cdot \sigma_{C_V} \quad \text{D.1}$$

Where:

\hat{C}_V is the gust coefficient.

\bar{C}_V is the mean coefficient.

g is the peak factor, taken as 3.0 for a 3s gust and 3.4 for a 0.5s gust.

σ_{C_V} is the standard deviation of coefficient measurement.

D.2 Calculation of the Full-Scale Results

The full-scale results determine if the wind conditions at a study location satisfy the designated criteria of that location. More specifically, the full-scale results need to determine the probability of exceedance of a given wind speed at a study location. To determine the probability of exceedance, the measured velocity coefficients were combined with a statistical model of the local wind climate that relates wind speed to a probability of exceedance. Details of the wind climate model are outlined in Section 5 of the main report.

The statistical model of the wind climate includes the impact of wind directionality as any local variations in wind speed or frequency with wind direction. This is important as the wind directions that produce the highest wind speed events for a region may not coincide with the most wind exposed direction at the site.

The methodology adopted for the derivation of the full-scale results for the maximum gust and the GEM wind speeds are outlined in the following sub-sections.

Maximum Gust Wind Speeds

The full-scale maximum gust wind speed at each study point location is derived from the measured coefficient using the following relationship:

$$V_{study} = V_{ref,RH} \left(\frac{k_{200m,tr,T=1hr}}{k_{RH,tr,T=1hr}} \right) C_V \quad D.2$$

Where:

V_{study} is the full-scale wind speed at the study point location, in m/s.

$V_{ref,RH}$ is the full-scale reference wind speed, measured 3m upstream at the study reference height. This value is determined by combining the directional wind speed data for the region (detailed in Section 5) and the upwind terrain and height multipliers for the site (detailed in Section 4).

$k_{200m,tr,T=1hr}$ is the standard deviation of the wind speed.

$k_{RH,tr,T=1hr}$ is the hourly mean terrain and height multiplier at the study reference height (see Section 4).

C_V is the velocity coefficient measurement obtained from the hot-wire anemometer, which is derived from the following relationship:

$$C_V = \frac{C_{V,study}}{C_{V,200m}} \quad D.3$$

Where:

$C_{V,study}$ is the coefficient measurement obtained from the hot-wire anemometer at the study point location.

$C_{V,200m}$ is the coefficient measurement obtained from the hot-wire anemometer at the free-stream reference location at 200m height upwind of the model in the wind tunnel.

The value of $V_{ref,RH}$ varies with each prevailing wind direction. Wind directions where there is a high probability that a strong wind will occur have a higher directional wind speed than other directions. To determine the directional wind speeds, a probability level must be assigned for each wind direction. These probability levels are set following the approach used in AS/NZS1170.2:2011, which assumes that the major contributions to the combined probability of exceedance of a typical load effect comes from only two 45 degree sectors.

Maximum Gust-Equivalent Mean Wind Speeds

The contribution to the probability of exceedance of a specified wind speed (ie: the desired wind speed for pedestrian comfort, as per the criteria) was calculated for each wind direction. These contributions are then combined over all wind directions to calculate the total probability of exceedance of the specified wind speed. To calculate the probability of exceedance for a specified wind speed a statistical wind climate model was used to describe the relationship between directional wind speeds and the probability of exceedance. A detailed description of the methodology is given by T.V. Lawson (1980).

The criteria used in this study is referenced to a probability of exceedance of 5% of a specified wind speed.

D.3 References relating to Data Acquisition

American Society of Civil Engineers (ASCE), ASCE-7-10, 2010, "Minimum Design Loads for Buildings and Other Structures".

Australasian Wind Engineering Society (AWES), QAM-1, 2017, "Quality Assurance Manual".

Council on Tall Buildings and Urban Habitat (CTBUH), 2013, "Wind tunnel testing of high-rise buildings", CTBUH Technical Guides.

Lawson, T.V., 1980, "Wind Effects on Buildings - Volume 1, Design Applications". Applied Science Publishers Ltd, Ripple Road, Barking, Essex, England.

Standards Australia and Standards New Zealand, AS/NZS 1170.2, 2011, "SAA Wind Loading Standard, Part 2: Wind Actions".