WIND-TUNNEL STUDY OF
PET PEDESTRIAN PLAZA, ST. LOUIS

by

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CSU Project 2-95950

October 1984

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# LIST OF SYMBOLS

| Symbol | Definition |
|--------|------------|
| U | Local mean velocity |
| D | Characteristic dimension (building height, width, etc.) |
| $\nu$, $\rho$ | Kinematic viscosity and density of approach flow |
| $\dfrac{UD}{\nu}$ | Reynolds number |
| E | Mean voltage |
| A, B, n | Constants |
| $U_{rms}$ | Root-mean-square of fluctuating velocity |
| $E_{rms}$ | Root-mean-square of fluctuating voltage |
| $U_\infty$ | Reference mean velocity outside the boundary layer |
| Z | Height above surface |
| $\delta$ | Height of boundary layer |
| $T_u$ | Turbulence intensity $\dfrac{U_{rms}}{U_\infty}$ or $\dfrac{U_{rms}}{U}$ |
| $(\ )_{min}$ | Minimum value during data record |
| $(\ )_{max}$ | Maximum value during data record |

# 1. INTRODUCTION

Increased use of pedestrian plazas adjacent to buildings has led to increased awareness of user comfort. Failure to consider the possibility of wind-related problems has caused many pedestrian-use areas to be used much less frequently than anticipated by the designer. Tall buildings near the plaza area can deflect high winds from upper elevations of the building down to plaza level causing unexpectedly windy environments near the base of the buildings.

The PET building in St. Louis was constructed with a plaza area extending underneath the building and opening onto two opposite sides (east and west) of the structure. The winds approaching from east and west were not blocked by upwind structures. The plaza has experienced high wind conditions with sufficient regularity that a design solution was sought. The purpose of this study was to evaluate several design options proposed by the architect as solutions to the problem.

An early testing phase using flow visualization and velocity measurements in a boundary layer wind tunnel to determine the magnitude of the problem showed that the wind environment in the plaza beneath the building was unacceptable evaluated on the basis of published acceptability criteria. Subsequent testing of several design solutions showed that the wind environment could be improved to a comfortable level for most activities by the addition of a greenhouse structure covering the entrance of the plaza under the building on the east side.

Details of the investigation are provided in the following sections.

## 2. WIND TUNNEL MODEL

### 2.1 Modeling

Techniques have been developed in the past two decades for wind tunnel modeling of proposed structures which allow the prediction of wind velocities and gusts in pedestrian areas adjacent to a building, wind pressures on cladding and windows, and overall structural loading. Information on sidewalk-level gustiness allows plaza areas to be protected by design changes before the structure is constructed. Alternatively, structures with existing design problems can be tested for proposed solutions to optimize the benefit to cost ratio.

Modeling of the wind flow about a structure requires special consideration of flow conditions in order to obtain similitude between model and prototype. A detailed discussion of the similarity requirements and their wind-tunnel implementation can be found in references (1), (2) and (3). In general, the requirements are that the model and prototype be geometrically similar, that the approach mean velocity at the building site have a vertical profile shape similar to the full-scale flow, that the turbulence characteristics of the flows be similar, and that the Reynolds number for the model and prototype be equal.

These criteria are satisfied by constructing a scale model of the structure and its surroundings and performing the wind tests in a wind tunnel specifically designed to model atmospheric boundary-layer flows. Reynolds number similarity requires that the quantity $UD/\nu$ be similar for model and prototype. Since $\nu$, the kinematic viscosity of air, is identical for both, Reynolds numbers cannot be made precisely equal with reasonable wind velocities. To accomplish this the air velocity in the wind tunnel would have to be as large as the model scale factor times

the prototype wind velocity, a velocity which would introduce unacceptable compressibility effects. However, for sufficiently high Reynolds numbers ($>2x10^4$) the flow pattern will remain fixed so that wind velocity at any location on the model will be a constant factor of a reference velocity in the approaching wind for a large range of Reynolds numbers. Typical values encountered are $10^7$-$10^8$ for the full-scale and $10^5$-$10^6$ for the wind-tunnel model. In this range acceptable flow similarity is achieved without precise Reynolds number equality.

## 2.2 Experimental Configuration

The wind-tunnel study was performed in the Fluid Dynamics and Diffusion Laboratory at Colorado State University (Figure 1). Three large wind tunnels are available for wind loading studies depending on the detailed requirements of the study. The Industrial Aerodynamics wind tunnel used for this investigation is shown in Figure 2. All tunnels have a flexible roof adjustable in height to maintain a zero pressure gradient along the test section. The mean velocity can be adjusted continuously in each tunnel to the maximum velocity available.

In order to obtain an accurate assessment of local wind velocities, the model was constructed to the largest scale that did not produce significant blockage in the wind-tunnel test section and which provided necessary adjacent buildings on the turntable. The 1:300 scale model was constructed of Lucite plastic. Significant variations in the building surface were modeled.

A circular area 1400 ft in radius was modeled in detail. Structures within the modeled region were made from styrofoam and cut to the individual building geometries. They were mounted on the turntable in their proper locations. Significant terrain features were included

as needed. The model was mounted on a turntable (Figure 2) near the downwind end of the test section. Any buildings or terrain features which did not fit on the turntable were placed on removable pieces which were placed upwind of the turntable for appropriate wind directions. A plan view of the building and its surroundings is shown in Figure 3. The turntable was calibrated to indicate azimuthal orientation to 0.1 degree.

The region upstream from the modeled area was covered with a randomized roughness constructed using 3/4 in. cubes placed on the floor of the wind tunnel. Spires were installed at the test-section entrance to provide a thicker boundary layer than would otherwise be available. The thicker boundary layer permitted a somewhat larger scale model than would otherwise be possible. The spires were approximately triangularly shaped pieces of 1/2 in. thick plywood 6 in. wide at the base and 1 in. wide at the top, extending from the floor to the top of the test section. They were placed so that the broad side intercepted the flow. A barrier approximately 8 in. high was placed on the test-section floor downstream of the spires to aid in development of the boundary-layer flow.

The distribution of the roughness cubes and the spires was designed to provide a boundary-layer thickness of approximately 4 ft, a velocity profile power-law exponent similar to that expected to occur in the region approaching the modeled area for each wind direction (a number of wind directions may have the same approach roughness). Mean velocity and turbulence intensity profiles approaching the model site are shown in Figure 4. Photographs of the model in the wind-tunnel are shown in Figure 5. The wind-tunnel ceiling was adjusted after placement of the model to obtain a zero pressure gradient along the test section.

Several design options were developed by the architect to alleviate the wind problems in the plaza area. These options included a greenhouse sealing the east entrance to the ground floor plaza, a wall filler on the north side of the plaza to prevent wind flow into the plaza through the north wall and a canopy over the west entrance. The options are illustrated in Figure 5. The north wall filler and west entrance canopy were tested only in conjunction with the greenhouse.

## 3. DATA ACQUISITION AND RESULTS

### 3.1 Flow Visualization

Making the air flow visible in the vicinity of the model is helpful in indicating areas where pedestrian discomfort may be a problem. Titanium dioxide smoke was released from sources on and near the model to make the flow lines visible and to make it possible to obtain video-tape records of the tests. Flow visualization of the existing configuration confirmed that wind velocities were high in the plaza area under the building. The greenhouse, with or without the north wall and west entrance fixes, significantly reduced wind velocities in the plaza.

### 3.2 Velocity Measurements

Mean velocity and turbulence intensity profiles were measured upstream of the model to determine that an approach boundary-layer flow appropriate to the site had been established. Tests were made at one wind velocity in the tunnel. This velocity was well above that required to produce Reynolds number similarity between the model and the prototype as discussed in Section 2.1.

In addition, mean velocity and turbulence intensity measurements were made 5 to 7 ft (prototype) above the surface at 22 locations on and near the building for 16 wind directions. The measurement locations are shown on Figure 3. The surface measurements are indicative of the wind environment to which a pedestrian at the measurement location would be subjected. The locations were chosen to determine the degree of pedestrian comfort or discomfort at the building corners where relatively severe conditions frequently are found, near building entrances and on adjacent sidewalks where pedestrian traffic is heavy, and in the plaza areas where there has been discomfort experienced in the past. A

reference pedestrian position, located about a block away in an open area was also tested. These data are helpful in evaluating the degree of pedestrian comfort or discomfort in the proposed plaza area in terms of the undisturbed environment in the immediate vicinity.

Measurements were made with a single hot-film anemometer mounted with its axis vertical. The instrumentation used was a Thermo Systems constant temperature anemometer (Model 1050) with a 0.001 in. diameter platinum film sensing element 0.020 in. long. Output was directed to the on-line data acquisition system for analysis.

Calibration of the hot-wire anemometer was performed by comparing output with a pitot-static tube in the wind tunnel. The calibration data were fit to a variable exponent King's Law relationship of the form

$$E^2 = A + BU^n$$

where E is the hot-wire output voltage, U the velocity and A, B, and n are coefficients selected to fit the data. The above relationship was used to determine the mean velocity at measurement points using the measured mean voltage. The fluctuating velocity in the form $U_{rms}$ (root-mean-square velocity) was obtained from

$$U_{rms} = \frac{2\,E\,E_{rms}}{B\,n\,U^{n-1}}$$

where $E_{rms}$ is the root-mean-square voltage output from the anemometer. For interpretation all turbulence measurements for pedestrian winds were divided by the mean velocity outside the boundary-layer $U_\infty$. Turbulence intensity in velocity profile measurements used the local mean velocity.

## 3.3 Results and Discussion

Velocity and turbulence profiles approaching the model are shown in Figure 4. Profiles were taken upstream from the model which are characteristic of the boundary layer approaching the model and at the building site with building removed. The boundary-layer thickness, $\delta$, is shown in Figure 4. The corresponding prototype value of $\delta$ for this study is also shown in the figure. This value was established as a reasonable height for this study. The mean velocity profile approaching the modeled area has the form

$$\frac{U}{U_\infty} = \left(\frac{z}{\delta}\right)^n \ .$$

The exponent $n$ for the approach flow established for this study is shown in Figure 4. The value $n = 0.22$ is characteristic of the area about the Pet building site.

Profiles of longitudinal turbulence intensity in the flow approaching the modeled area are shown in Figure 4. The turbulence intensities are appropriate for the approach mean velocity profile selected. For the velocity profiles, turbulence intensity is defined as the root-mean-square about the mean of the longitudinal velocity fluctuations divided by the local mean velocity $U$,

$$Tu = \frac{U_{rms}}{U} \ .$$

Velocity data obtained at each of the pedestrian measurement locations shown in Figure 3 are listed in Table 2 as mean velocity $U/U_\infty$, turbulence intensity $U_{rms}/U_\infty$, and largest effective gust

$$U_{pk} = \frac{U + 3U_{rms}}{U_\infty} \ .$$

These data are plotted in polar form in Figure 6. A site map is superimposed on the polar plots to aid in visualization of the effects of the nearby structures on the velocity and turbulence magnitudes. The summary pages of Table 2 show that the largest velocities were measured at locations 12, 13 and 14 in the covered plaza for the existing configuration. Mean velocity percentages above 90 percent of $U_\infty$ were measured for this geometry. These values are quite high. With the addition of the greenhouse, these velocities decreased to 30-35 percent of $U_\infty$.

To enable a quantitative assessment of the wind environment, the wind-tunnel data were combined with wind frequency and direction information obtained at the local airport. Table 1 shows wind frequency by direction and magnitude obtained from summaries published by the National Weather Service. These data, obtained at an elevation of 20 ft, were converted to velocities at the reference velocity height for the wind-tunnel measurements and combined with the wind-tunnel data to obtain cumulative probability distributions (percent time a given velocity is exceeded) for wind velocity at each measuring location. The percentage times were summed by wind direction to obtain a percent time exceeded at each measuring position independent of wind direction (but accounting for the fact that the wind blows from different directions with varying frequency). These results are plotted in Figure 7.

Interpretation of Figure 7 is aided by a description of the effects of wind of various magnitudes on people. The earliest quantitative description of wind effects was established by Sir Francis Beaufort in 1806 for use at sea and is still in use today. Several recent investigators have added to the knowledge of wind effects of pedestrians.

These investigations along with suggested criteria for acceptance have been summarized by Penwarden and Wise (4) and Melbourne (5). The Beaufort scale (from ref. 4), based on mean velocity, is reproduced as Table 3 including qualitative descriptions of wind effects. Table 3 suggests that mean wind speeds below 12 mph are of minor concern and that mean speeds above 24 mph are definitely inconvenient. Quantitative criteria for acceptance from reference 5 are superimposed as dashed lines on Figure 7. The peak gust curves shown in Figure 7 are the percent of time during which a short gust of the stated magnitude could occur (say about one of these gusts per hour).

The data of Figure 7 show that the wind speeds on the plaza under the building in the existing configuration are unacceptable when compared to the published acceptability criteria. The data indicate that modifications should be made to improve the plaza wind environment. Addition of the greenhouse decreased wind speeds in the plaza to a level which should be comfortable for long-duration activities for 95 to 99 percent of the time. Reductions below this level are not needed. Addition of the north wall closure or west entrance canopy with the greenhouse in place provided a slight additional decrease in wind speeds below those attained by the greenhouse alone. These additions are not necessary and could contribute to stagnant air in the plaza on low wind days.

By blocking the wind flow through the plaza, the temperature under the greenhouse cover on the east side on warm, non-windy days may reach uncomfortable levels. Consideration could be given to operable doors or windows in the greenhouse which would permit a higher level of ventilation under the greenhouse when desired.

If the greenhouse solution is selected, that structure will be subjected to wind loading from both sides. This wind load should be determined by wind-tunnel test during the design stage to select an adequate wind load.

## REFERENCES

1.  Cermak, J. E., "Laboratory Simulation of the Atmospheric Boundary Layer," AIAA Jl., Vol. 9, September 1971.

2.  Cermak, J. E., "Applications of Fluid Mechanics to Wind Engineering," A Freeman Scholar Lecture, ASME J. of Fluids Engineering, Vol. 97, No. 1, March 1975.

3.  Cermak, J. E., "Aerodynamics of Buildings," Annual Review of Fluid Mechanics, Vol. 8, 1976, pp. 75-106.

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

5.  Melbourne, W. H., "Criteria for Environmental Wind Conditions," Jl. Industrial Aerodynamics, Vol. 3, pp. 241-247, 1978.

FIGURES
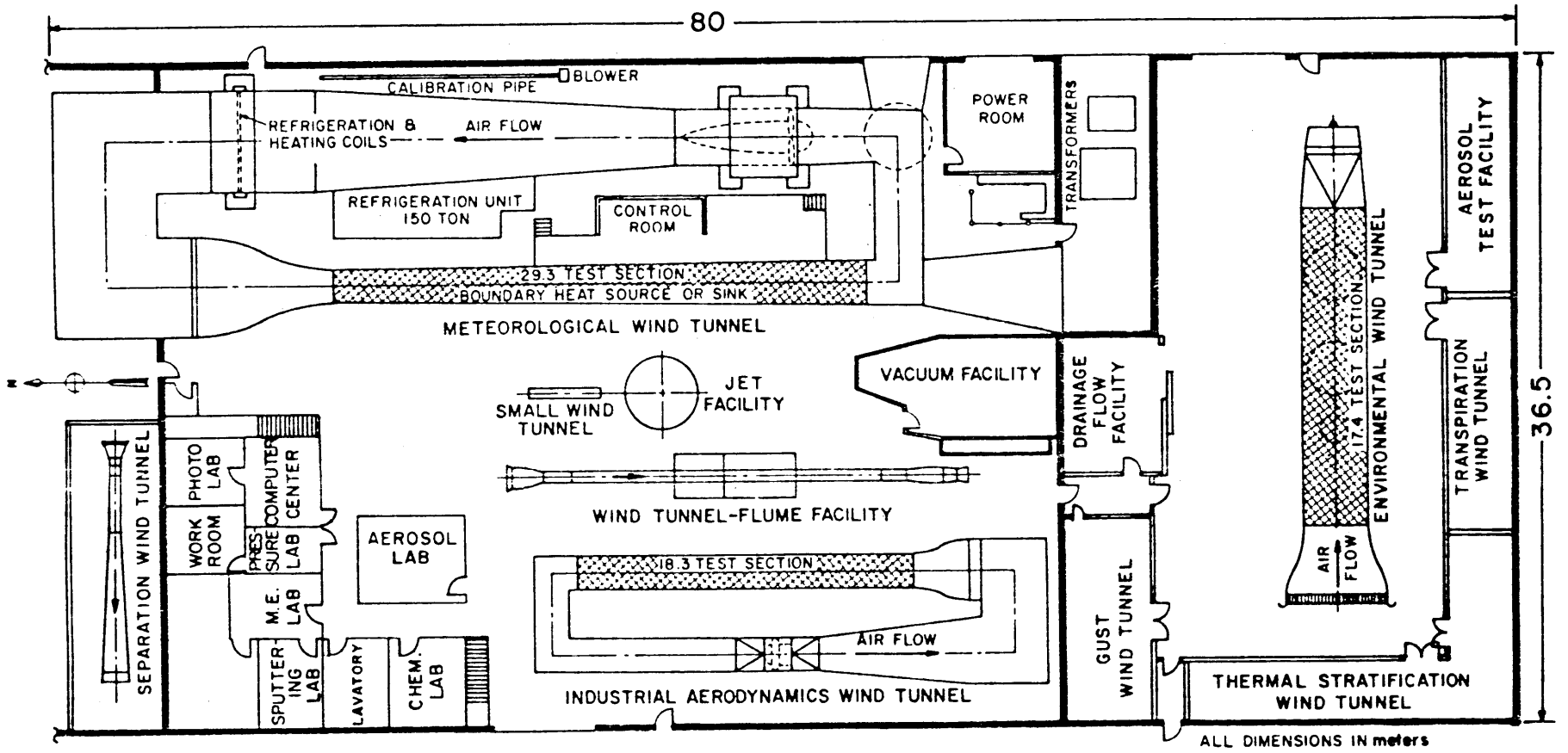
Figure 1. Fluid Dynamics and Diffusion Laboratory, Colorado State University

28.04

75 H.P.
Blower            Velocity Range: 0.5-25 m/s

Air Flow

7.93

6.39

18.29
16.76            Test Section

1.80

Upwind Roughness Elements

Building Model Turntable

Buildings Upstream of Turntable

Screens

<u>P L A N</u>

0   1   2   3   4   5
Scale, m

7.30
Adjustable Ceiling

3.95
3.66

1.80

2.13   1.22
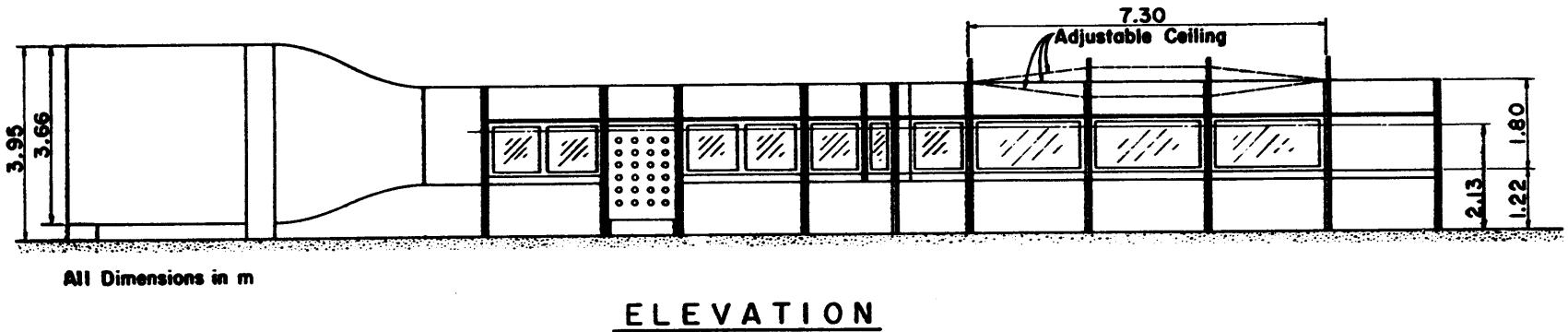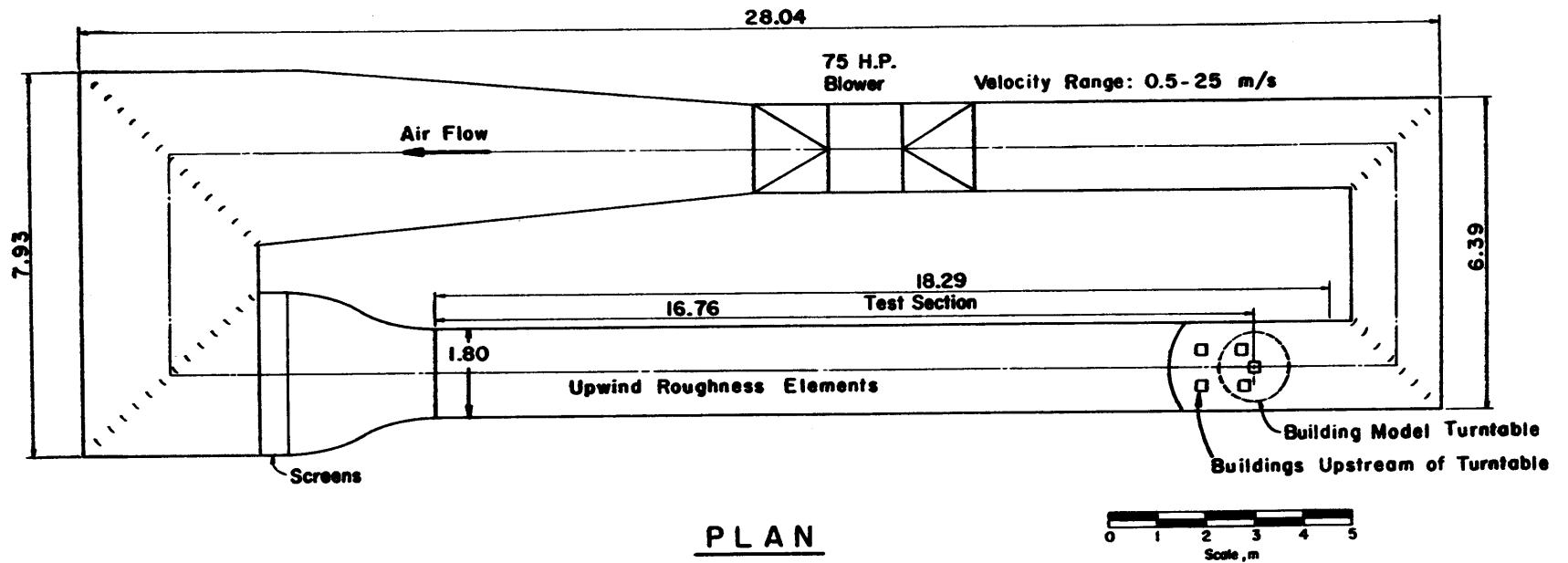
All Dimensions in m

<u>E L E V A T I O N</u>

INDUSTRIAL AERODYNAMICS WIND TUNNEL

Figure 2 - Wind Tunnel Configuration
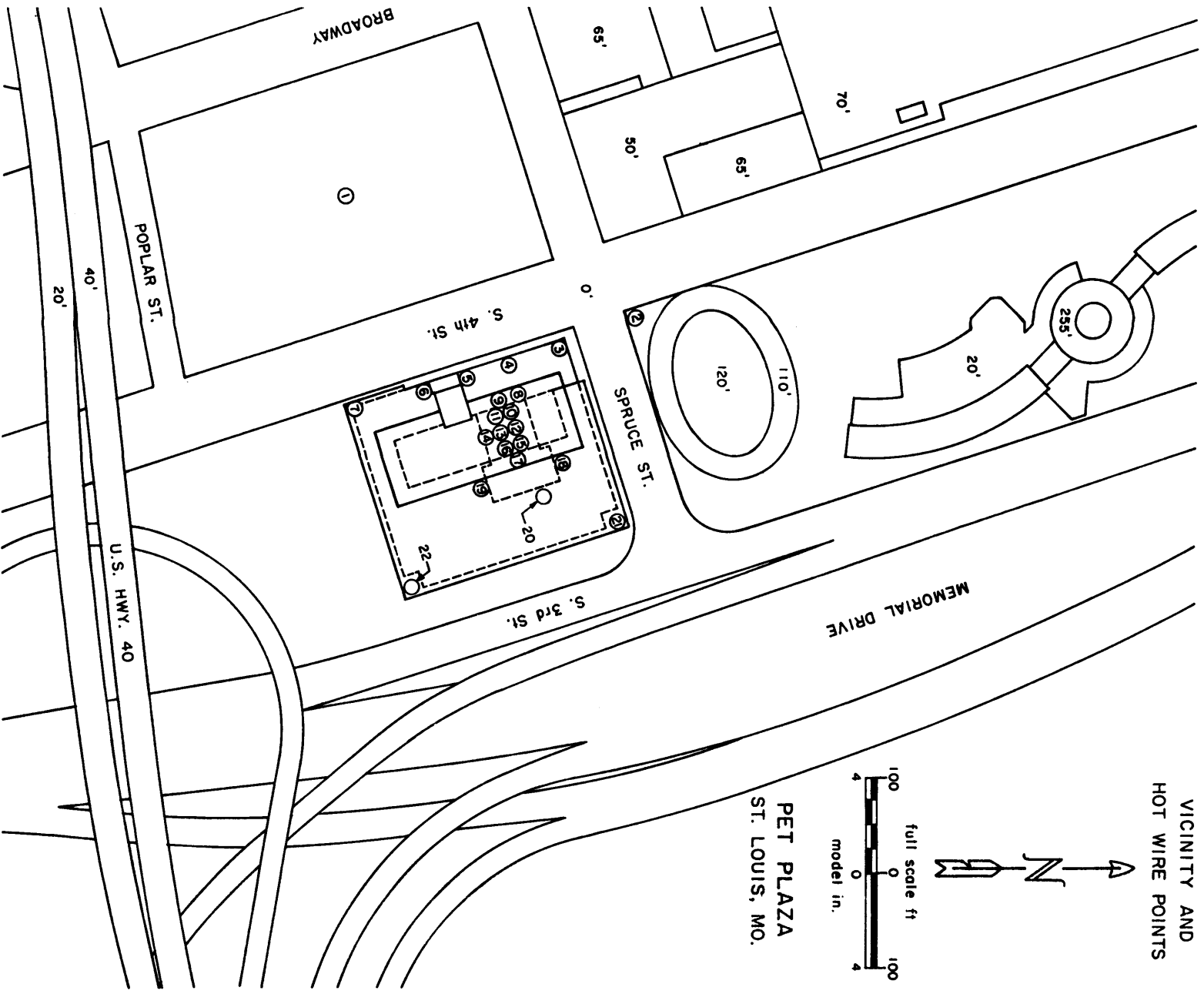
Figure 3. Pedestrian Wind Velocity Measuring Positions

16

VICINITY AND
HOT WIRE POINTS

PET PLAZA
ST. LOUIS, MO.

## MEAN VELOCITY PROFILES

$$\delta = 1000 \text{ ft. full scale}$$

$$\delta = 40.0 \text{ in. model scale}$$

$$\frac{U}{U\infty} = \left(\frac{Z}{\delta}\right)^n$$

□ $n = 0.22$

## TURBULENCE PROFILES

□ APPROACH

○ SITE 67 DEG.

△ SITE 292 DEG.

Z/δ

MEAN VELOCITY U/U∞

TURBULENCE INTENSITY, Urms/U, %

17
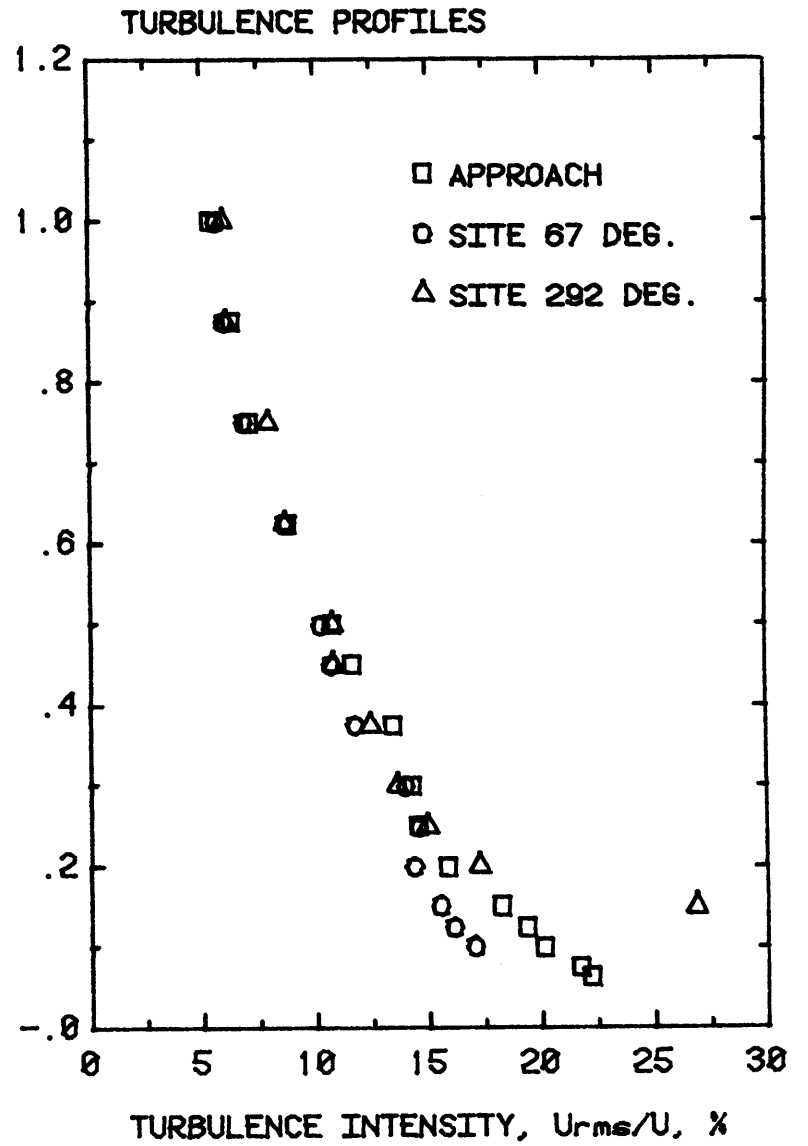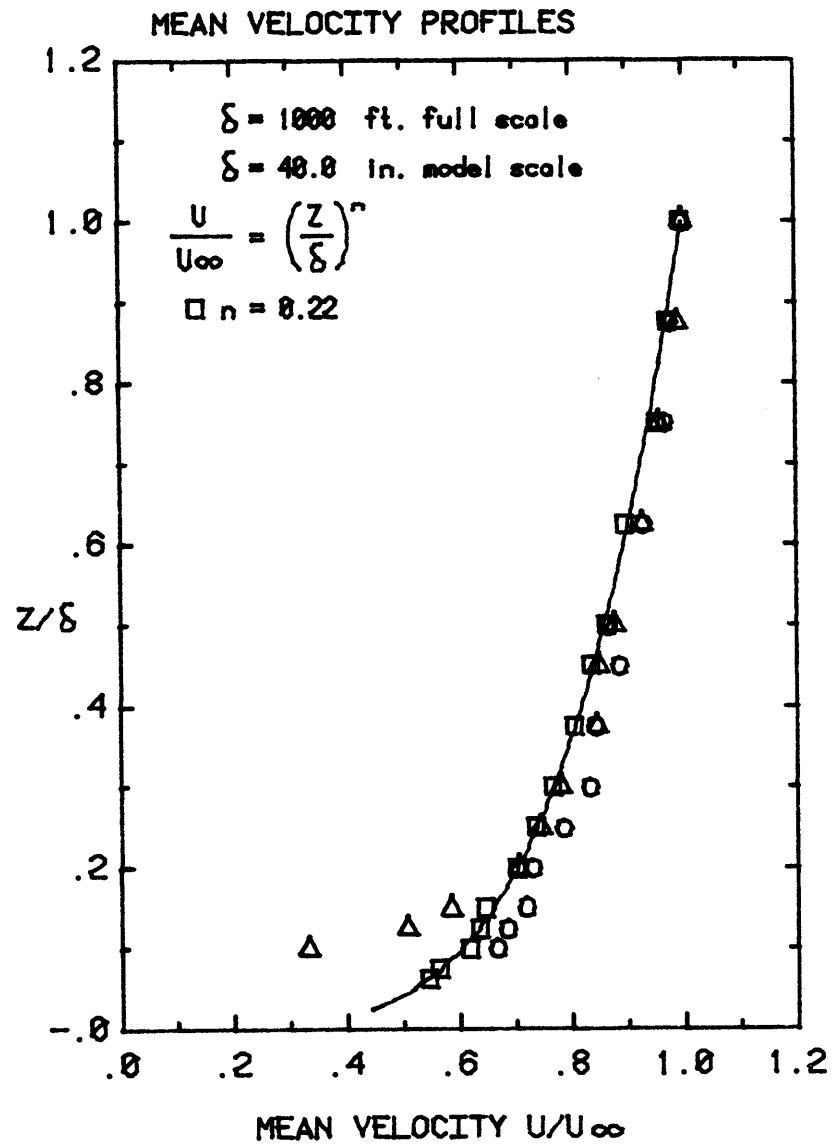
Figure 4.  Mean Velocity and Turbulence Profiles Approaching the Model

Figure 5a. Completed Model in the Wind Tunnel
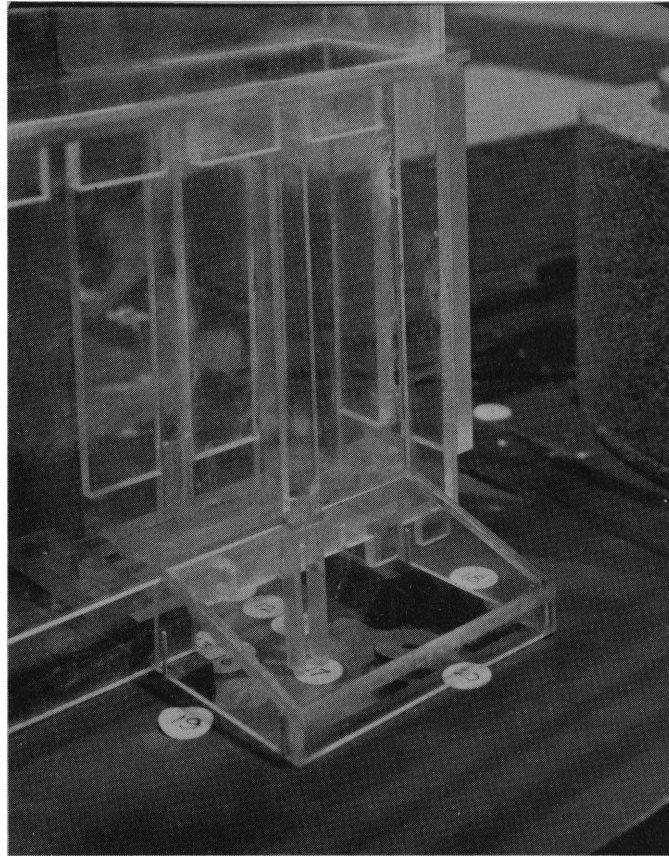
Greenhouse Design Option Blocking
Wind from Plaza Under Building


Figure 5b.  Completed Model in the Wind Tunnel

North
Wall
Closure

West
Entrance
Canopy
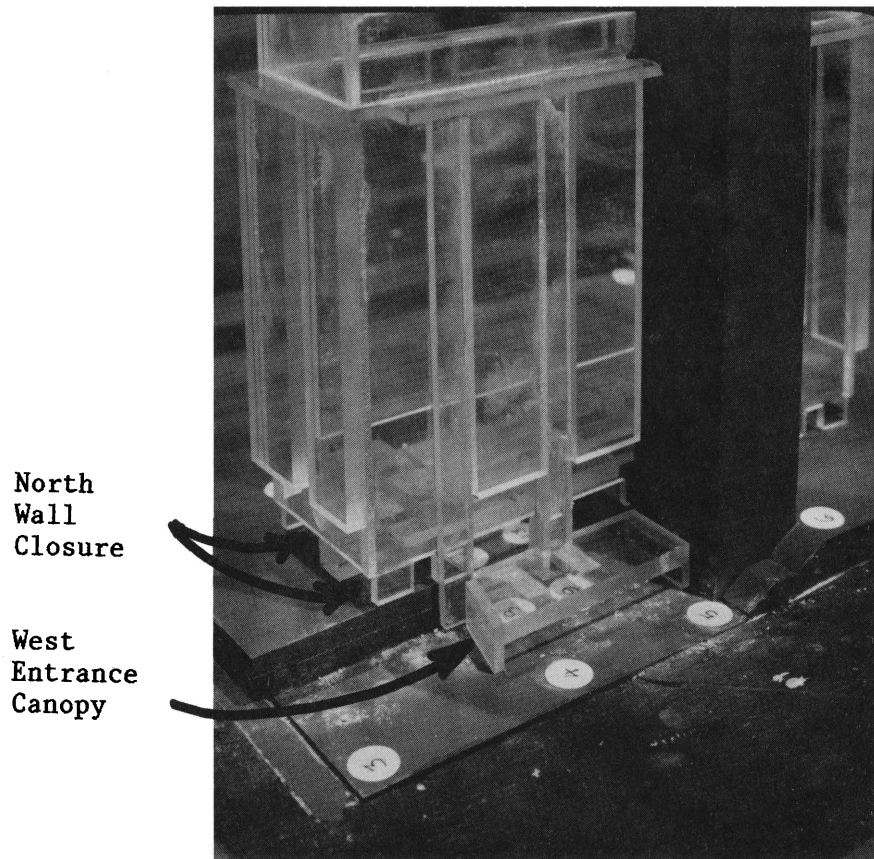
Design Options Used Individually in Conjunction
with the Greehouse Design Option

Figure 5c.  Completed Model in the Wind Tunnel

EXISTING CONFIGURATION
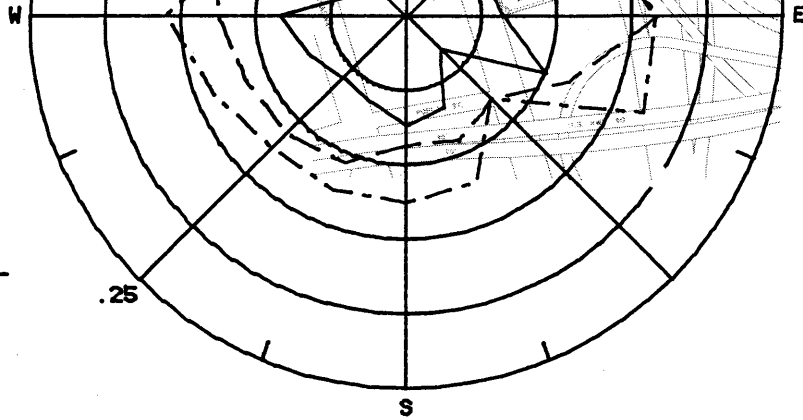
$$\frac{Umean}{Uinf}$$ ____

$$\frac{Umean+ 3*Urms}{Uinf}$$ _ . _

.25/Div

$$\frac{Urms}{Uinf}$$ _ _

.05/Div

Location 1

$$\frac{Umean}{Uinf}$$ ____

$$\frac{Umean+ 3*Urms}{Uinf}$$ _ . _
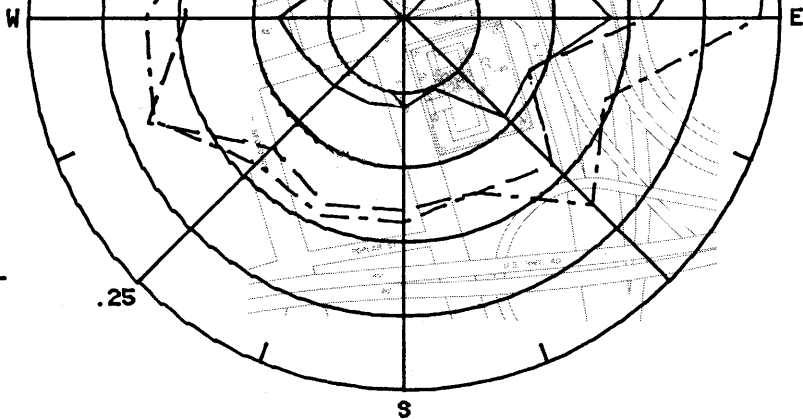
.25/Div

$$\frac{Urms}{Uinf}$$ _ _

.05/Div

Location 2

Figure 6a.  Mean Velocities and Turbulence Intensities
at Pedestrian Locations 1 and 2

EXISTING CONFIGURATION

Location 3

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ _ . _ .

.25/Div

$$\frac{Urms}{Uinf}$$ _ _

.05/Div

1.25

.25

N

W

E

S

Location 4

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ _ . _ .

.25/Div

$$\frac{Urms}{Uinf}$$ _ _

.05/Div

1.25

.25

N

W

E

S
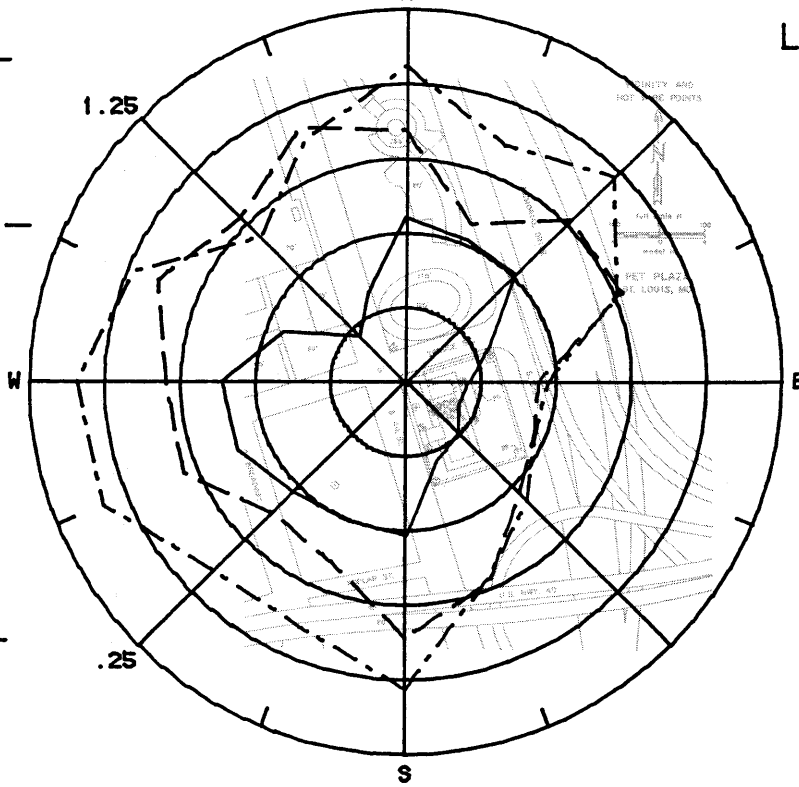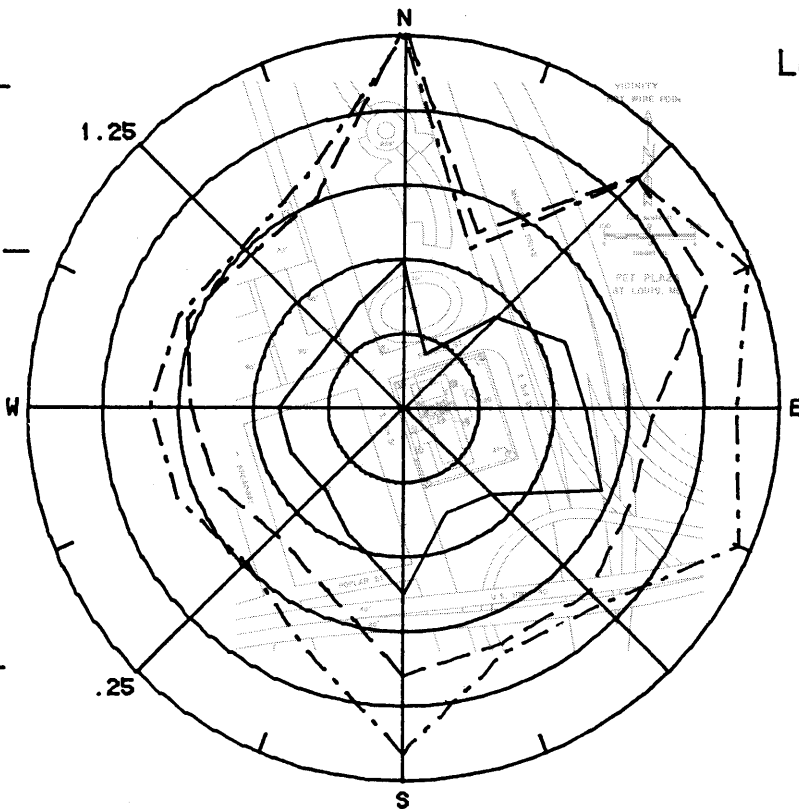
Figure 6b.   Mean Velocities and Turbulence Intensities
at Pedestrian Locations 3 and 4

EXISTING CONFIGURATION
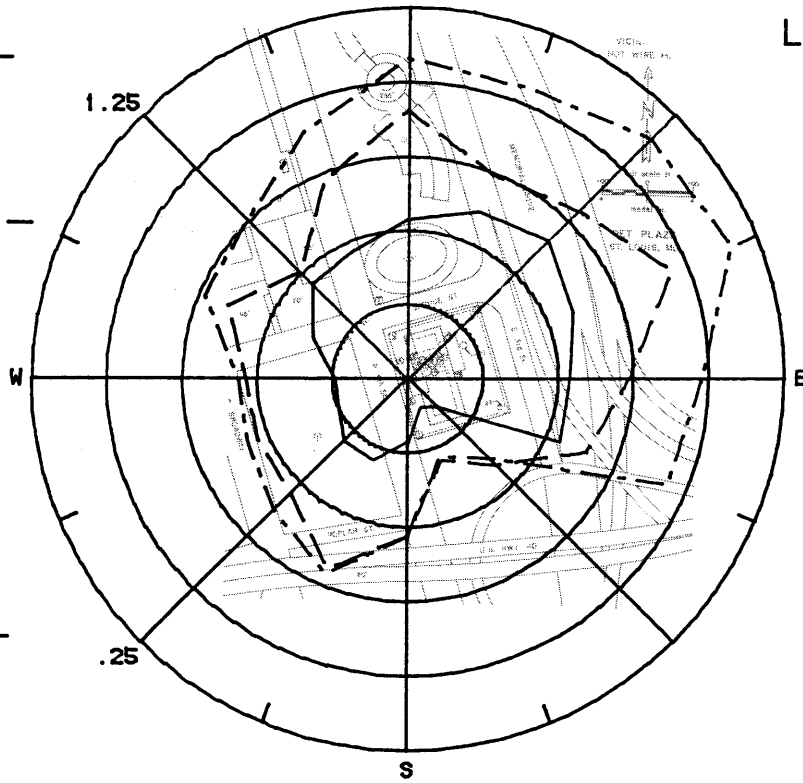
Location 5

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ __ . __

.25/Div

$$\frac{Urms}{Uinf}$$ __ __

.05/Div

1.25

.25

N
W    E
S

Location 6

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ __ . __

.25/Div

$$\frac{Urms}{Uinf}$$ __ __

.05/Div

1.25

.25
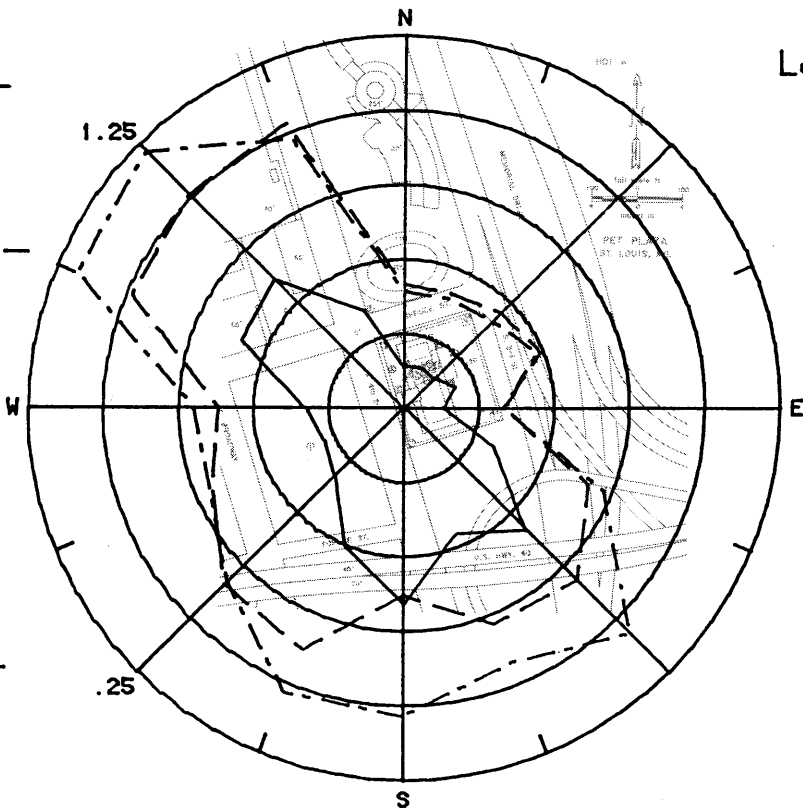
N
W    E
S

Figure 6c.  Mean Velocities and Turbulence Intensities
at Pedestrian Locations 5 and 6

EXISTING CONFIGURATION

Location 7

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ _ . _ . _
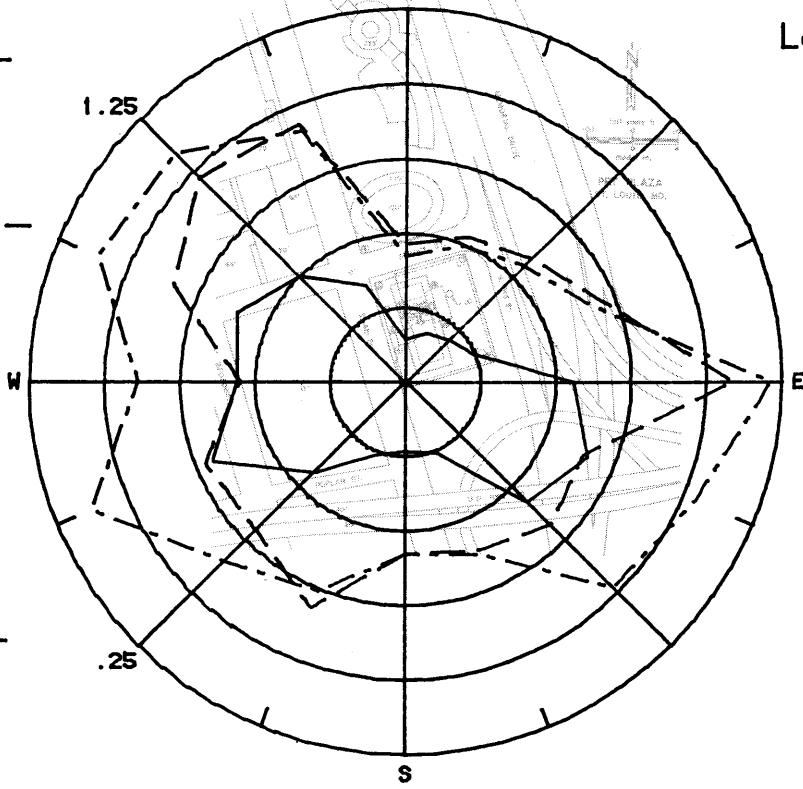
.25/Div

$$\frac{Urms}{Uinf}$$ __ __

.05/Div

1.25

.25

N

W

E

S

$$\frac{Umean}{Uinf}$$ _____

Location 8

$$\frac{Umean+3*Urms}{Uinf}$$ _ . _ . _

.25/Div

$$\frac{Urms}{Uinf}$$ __ __

.05/Div

1.25

.25

N

W

E
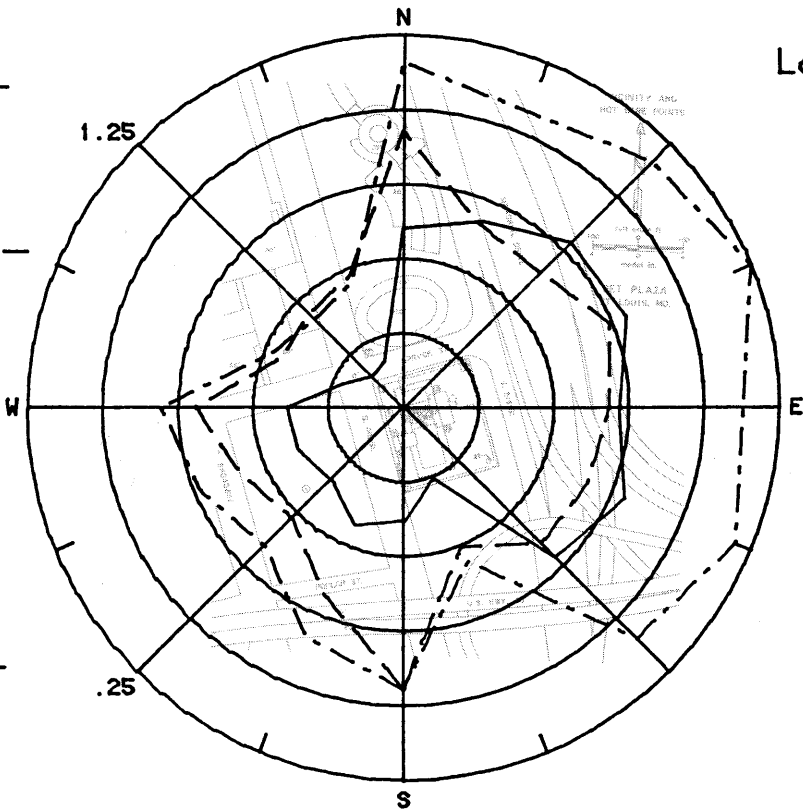
S

Figure 6d. Mean Velocities and Turbulence Intensities
at Pedestrian Locations 7 and 8

EXISTING CONFIGURATION

Location 9

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ _._._

.25/Div

$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div

Location 10

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ _._._

.25/Div

$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div

Figure 6e.   Mean Velocities and Turbulence Intensities
at Pedestrian Locations 9 and 10

EXISTING CONFIGURATION

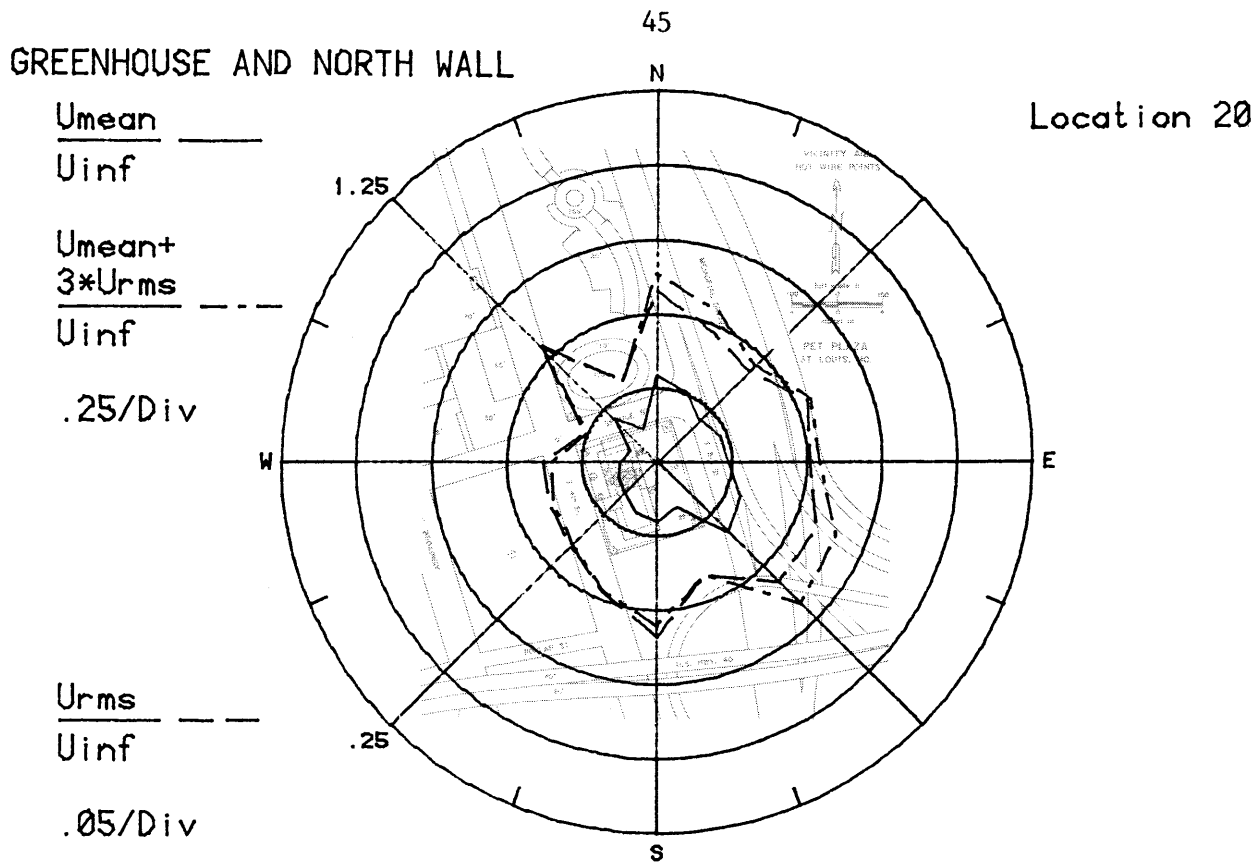Location 11

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ __ . __

.25/Div

$$\frac{Urms}{Uinf}$$ __ __

.05/Div

N

1.25

W · E

.25

S

Location 12

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ __ . __

.25/Div

$$\frac{Urms}{Uinf}$$ __ __

.05/Div

N

1.25

W · E

.25
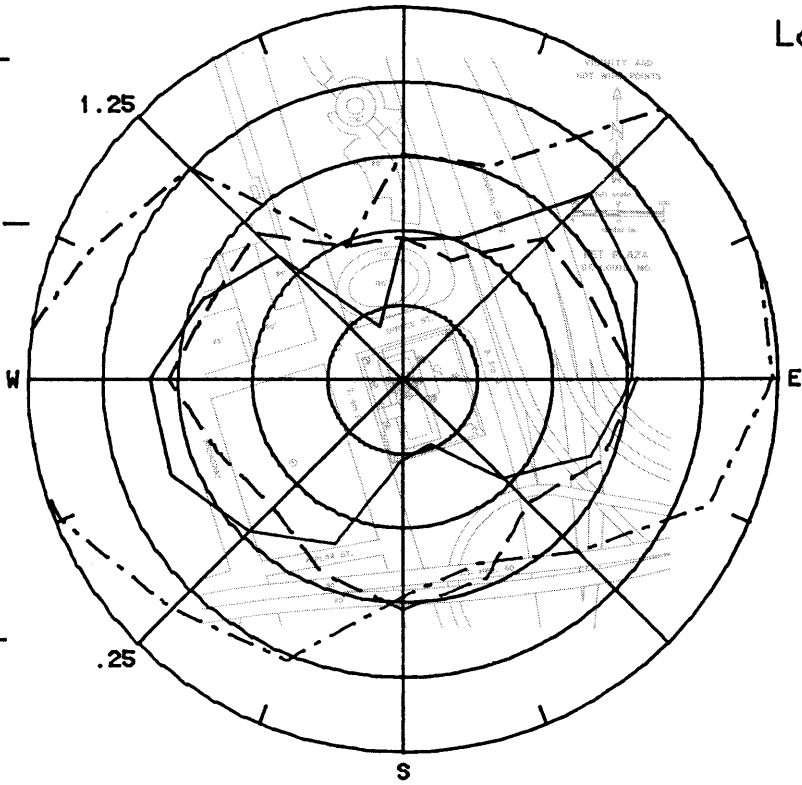
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Figure 6f.   Mean Velocities and Turbulence Intensities
at Pedestrian Locations 11 and 12
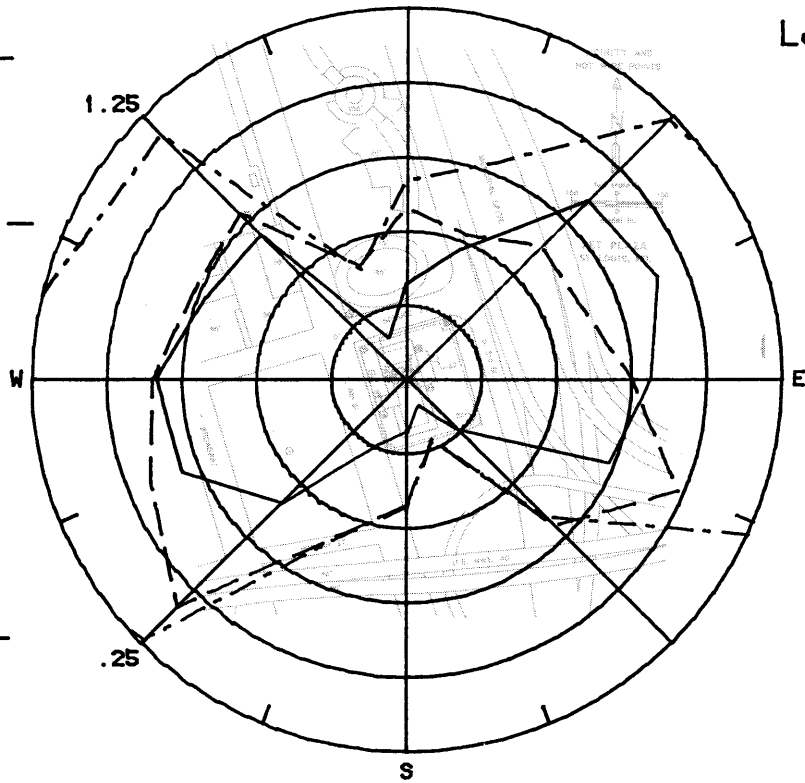
Figure 6g. Mean Velocities and Turbulence Intensities
at Pedestrian Locations 13 and 14

EXISTING CONFIGURATION

Location 15

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ _.._.._
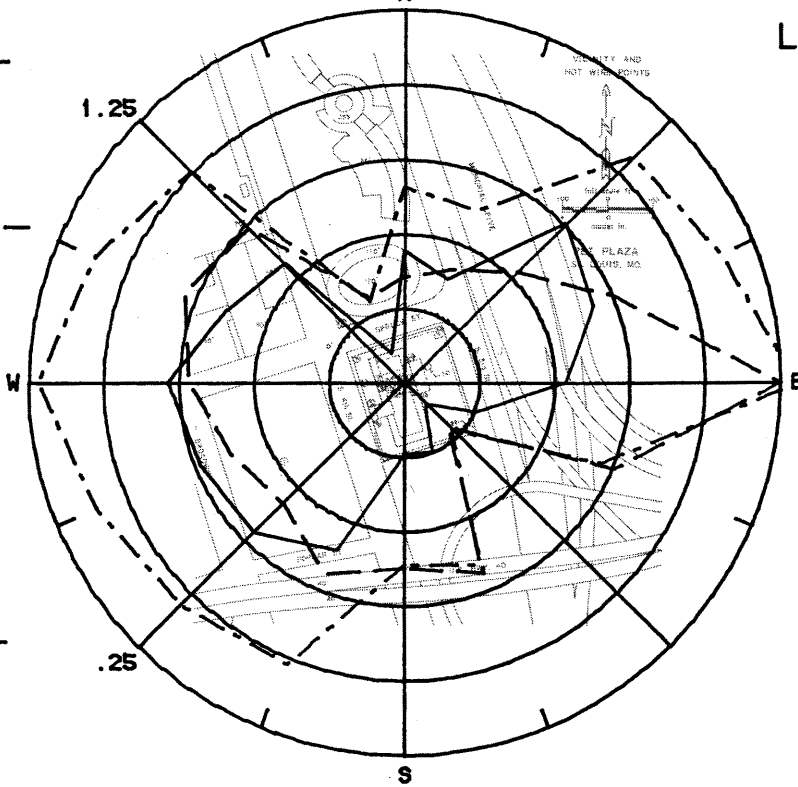
.25/Div

$$\frac{Urms}{Uinf}$$ __ __

.05/Div

1.25

N

W        E

.25

S

Location 16

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ _.._.._

.25/Div

$$\frac{Urms}{Uinf}$$ __ __

.05/Div

1.25

N

W        E

.25

S
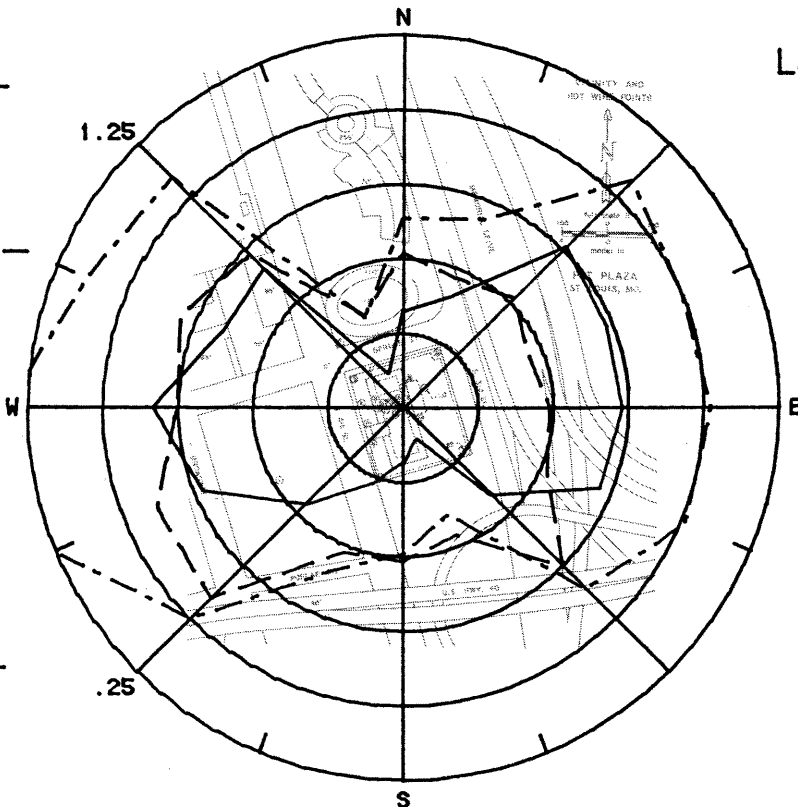
Figure 6h.   Mean Velocities and Turbulence Intensities
at Pedestrian Locations 15 and 16

EXISTING CONFIGURATION

Location 17

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ _·—·—·
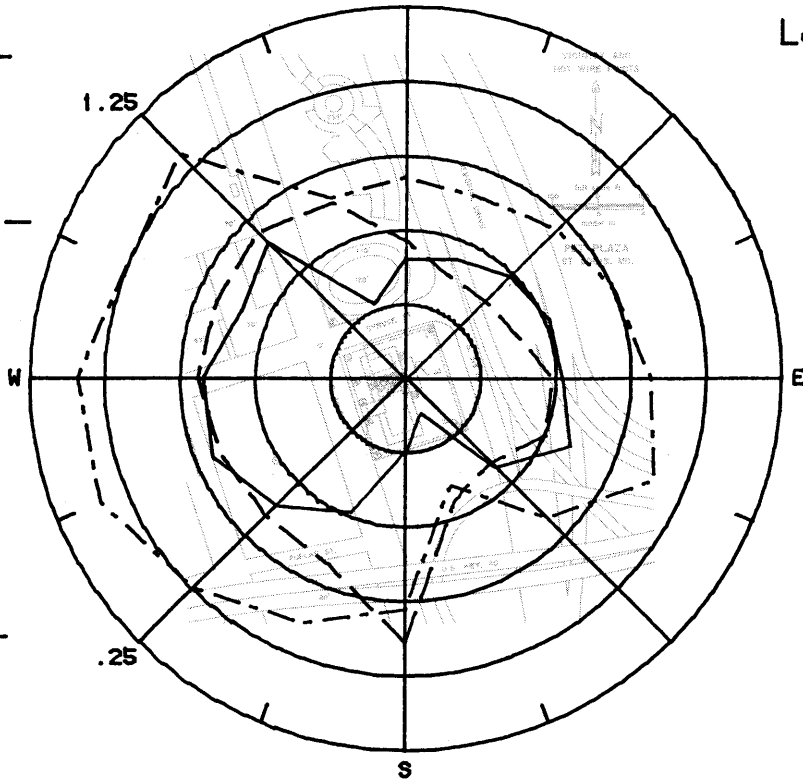
.25/Div

$$\frac{Urms}{Uinf}$$ _— — —

.05/Div

Location 18

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ _·—·—·
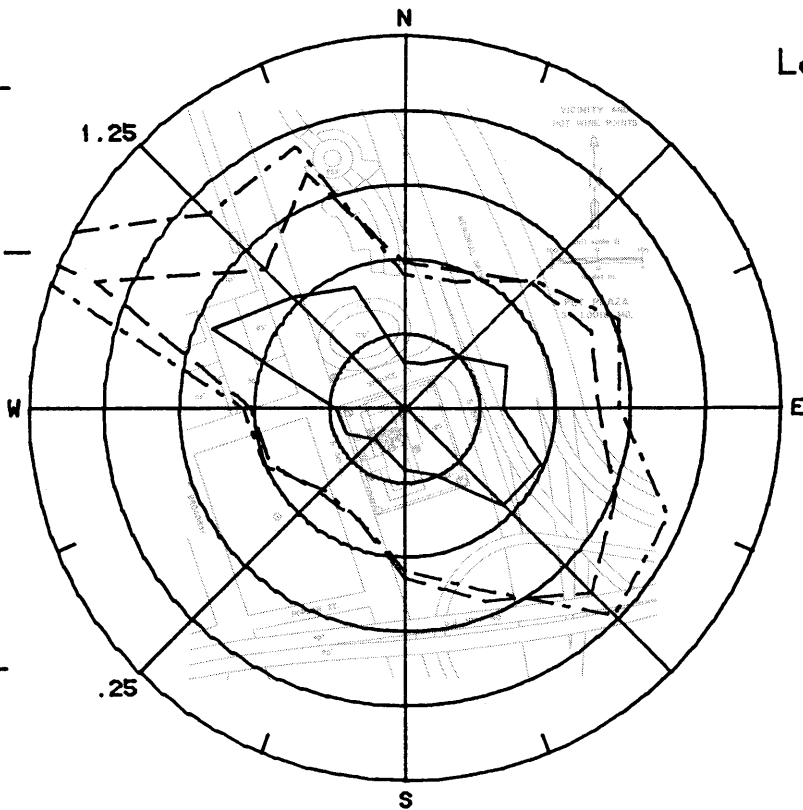
.25/Div

$$\frac{Urms}{Uinf}$$ _— — —

.05/Div

Figure 6i.  Mean Velocities and Turbulence Intensities
at Pedestrian Locations 17 and 18

EXISTING CONFIGURATION
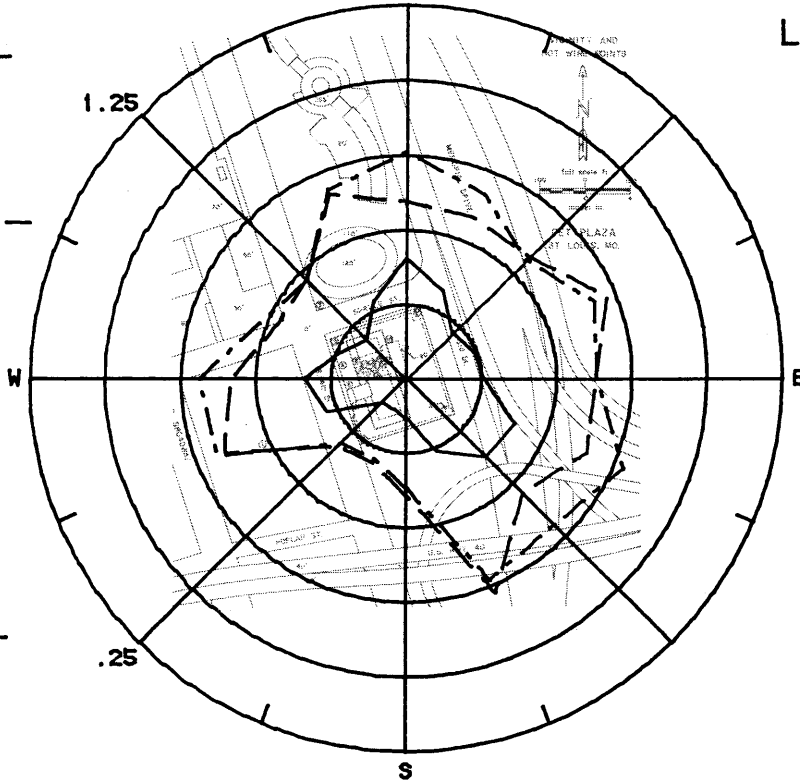
$$\frac{Umean}{Uinf}$$ ____

$$\frac{Umean+3*Urms}{Uinf}$$ _ _ . _

.25/Div

$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div

Location 19

N

1.25

W

E

.25

S

$$\frac{Umean}{Uinf}$$ ____

$$\frac{Umean+3*Urms}{Uinf}$$ _ _ . _

.25/Div

$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div

Location 20

N

1.25

W

E

.25
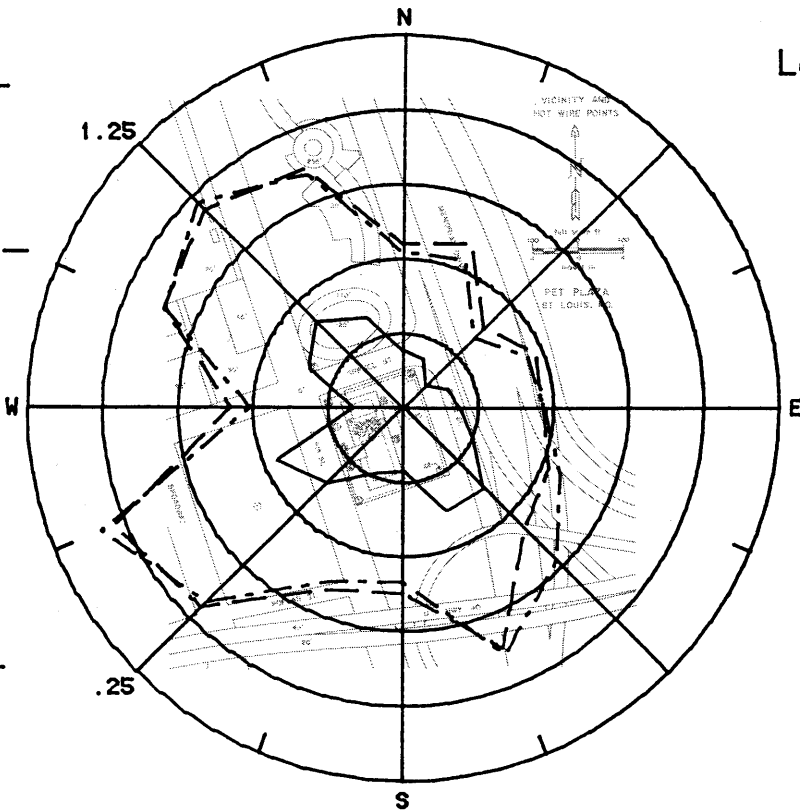
S

Figure 6j.   Mean Velocities and Turbulence Intensities
at Pedestrian Locations 19 and 20

EXISTING CONFIGURATION

Location 21

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ _ . _ . _
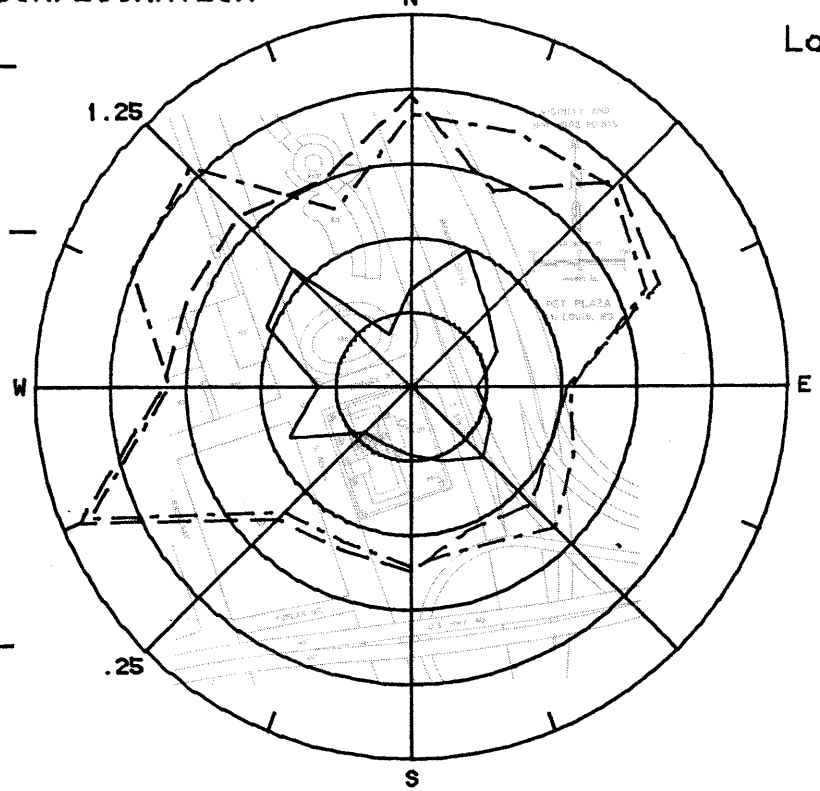
.25/Div

$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div

Location 22

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ _ . _ . _

.25/Div
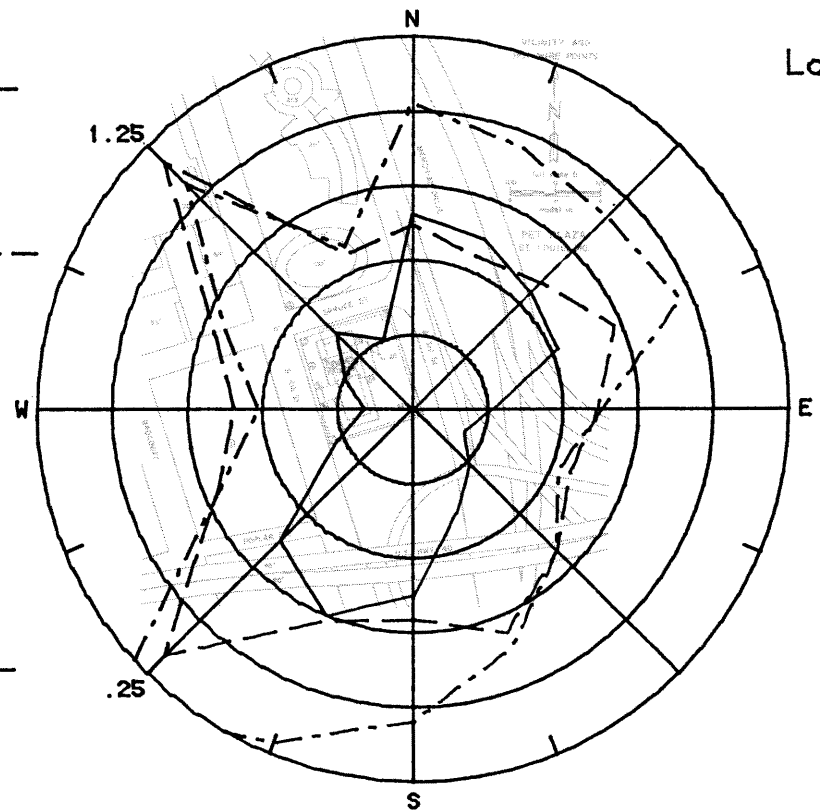
$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div

Figure 6k.  Mean Velocities and Turbulence Intensities
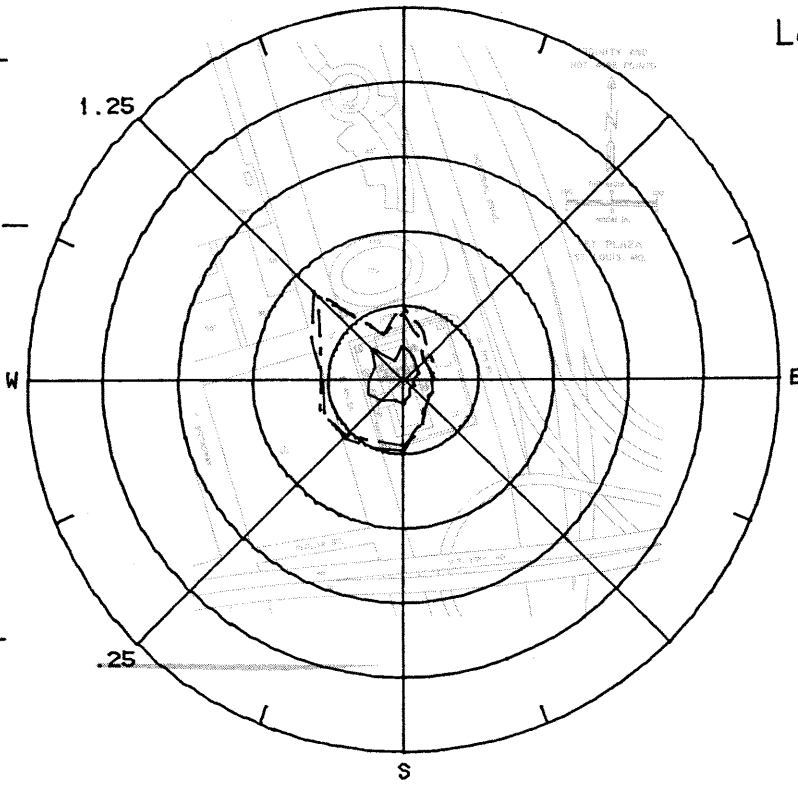at Pedestrian Locations 21 and 22

GREENHOUSE ONLY

Location 3

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+}{3*Urms}$$ ___ . ___
$$\overline{Uinf}$$

.25/Div

1.25

N

W

E

S

$$\frac{Urms}{Uinf}$$ ___ ___

.25

.05/Div

$$\frac{Umean}{Uinf}$$ _____

Location 4

$$\frac{Umean+}{3*Urms}$$ ___ . ___
$$\overline{Uinf}$$

.25/Div

1.25

N

W

E

S

$$\frac{Urms}{Uinf}$$ ___ ___

.25
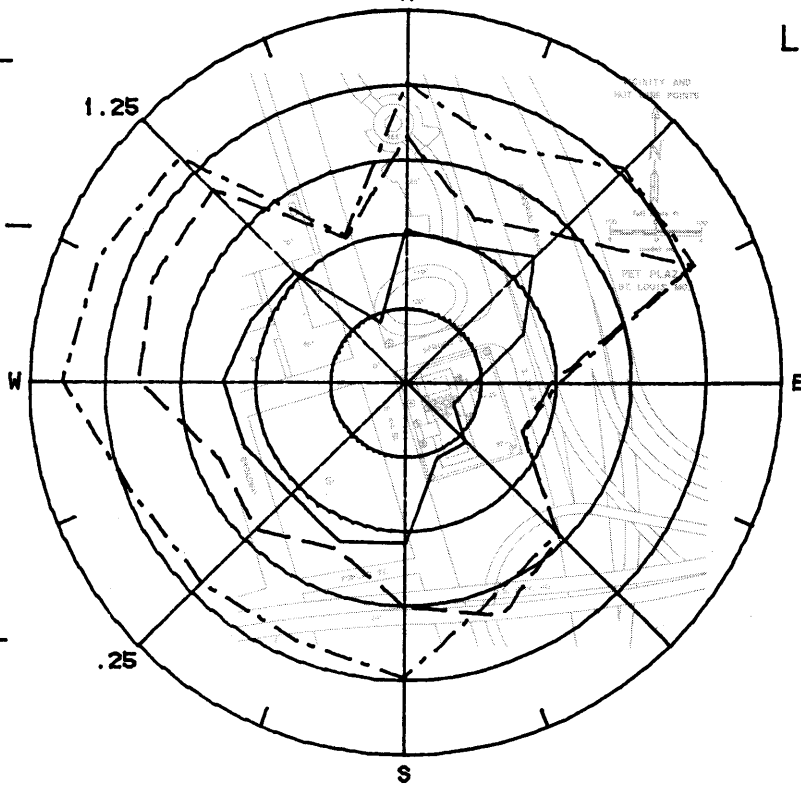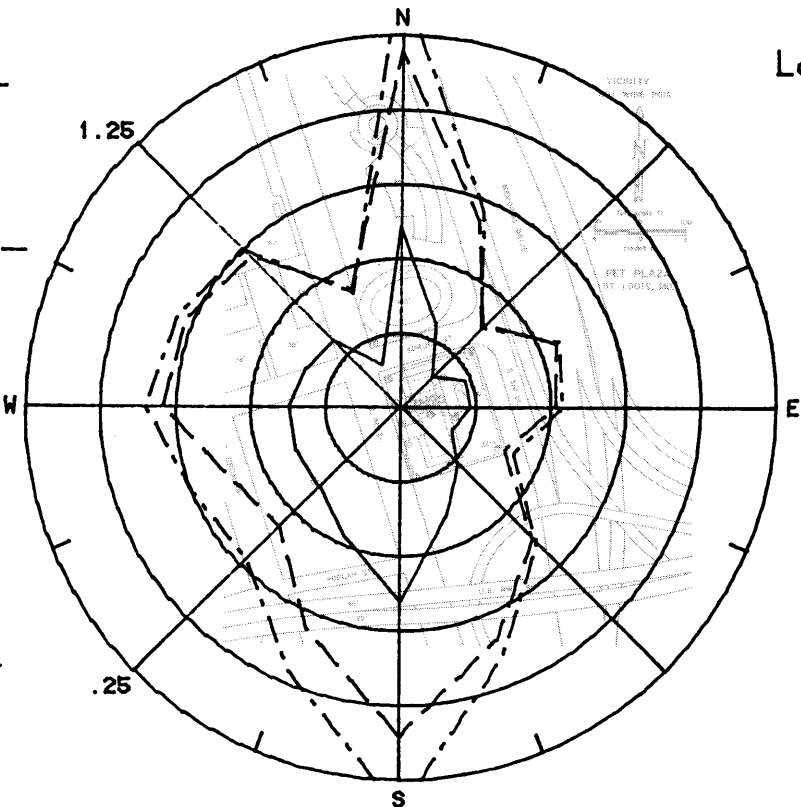
.05/Div
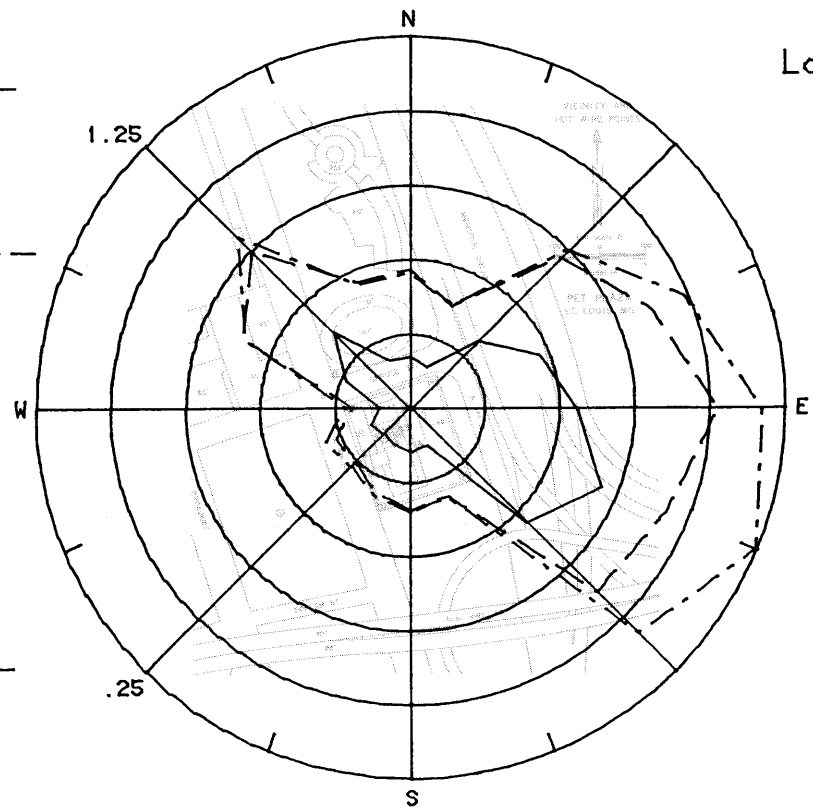
Figure 61.   Mean Velocities and Turbulence Intensities
             at Pedestrian Locations 3 and 4

GREENHOUSE ONLY
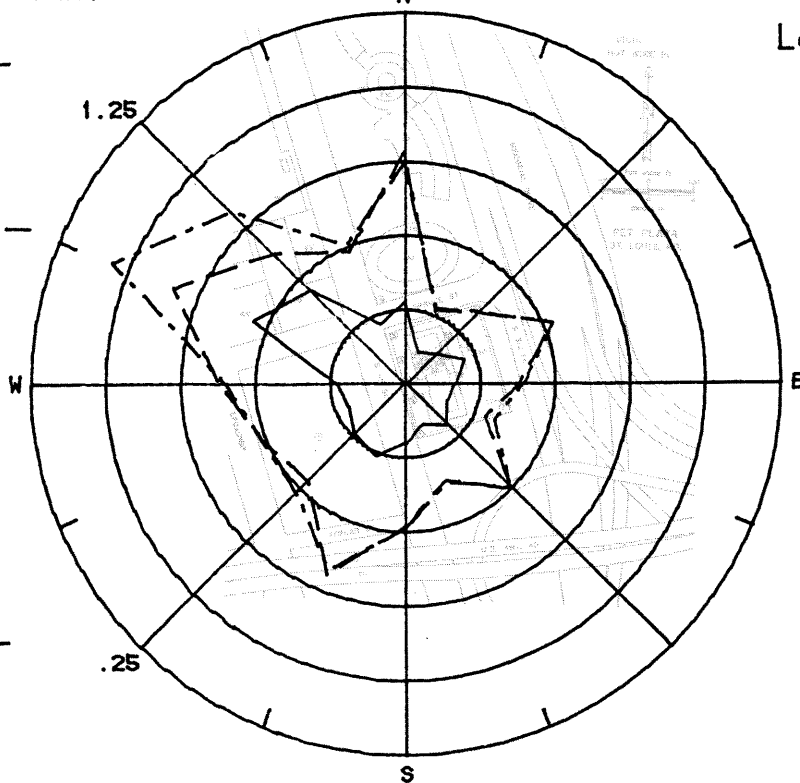
Location 5

$$\frac{Umean}{Uinf}$$ ____

$$\frac{Umean+3*Urms}{Uinf}$$ _ _ . _

.25/Div

$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div

Location 8
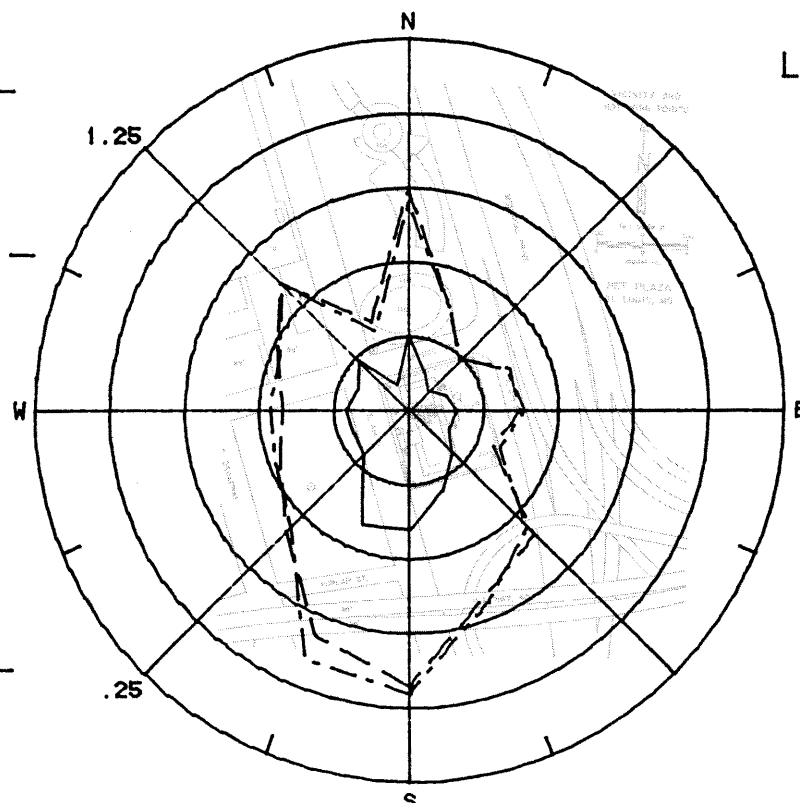
$$\frac{Umean}{Uinf}$$ ____

$$\frac{Umean+3*Urms}{Uinf}$$ _ _ . _

.25/Div

$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div

Figure 6m.  Mean Velocities and Turbulence Intensities
at Pedestrian Locations 5 and 8

GREENHOUSE ONLY

Location 9

$$\frac{Umean}{Uinf}$$ ____

$$\frac{Umean+3*Urms}{Uinf}$$ _ . _ . _
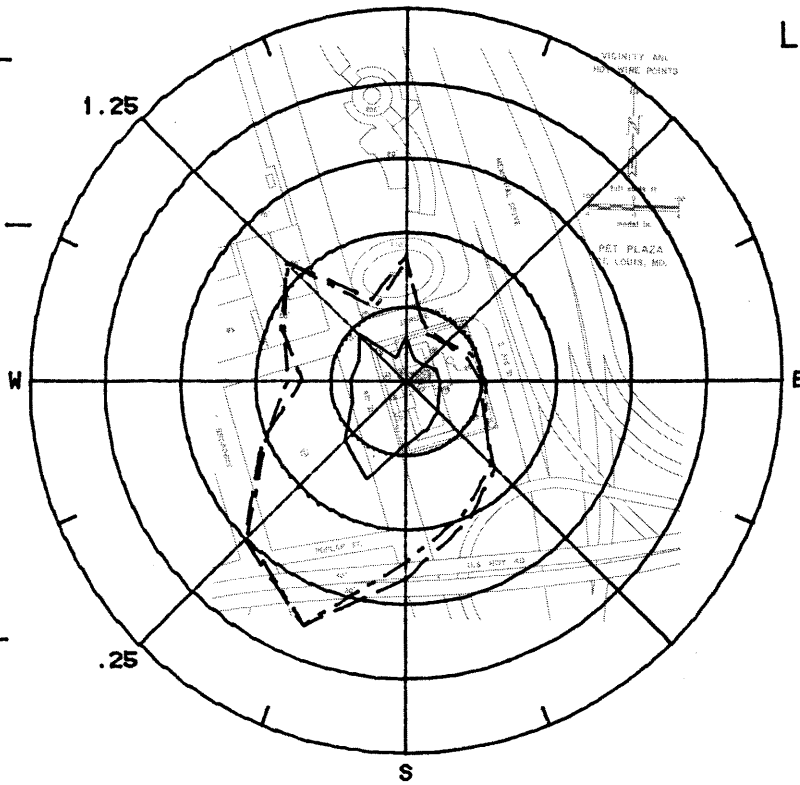
.25/Div

$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div

Location 10

$$\frac{Umean}{Uinf}$$ ____

$$\frac{Umean+3*Urms}{Uinf}$$ _ . _ . _

.25/Div
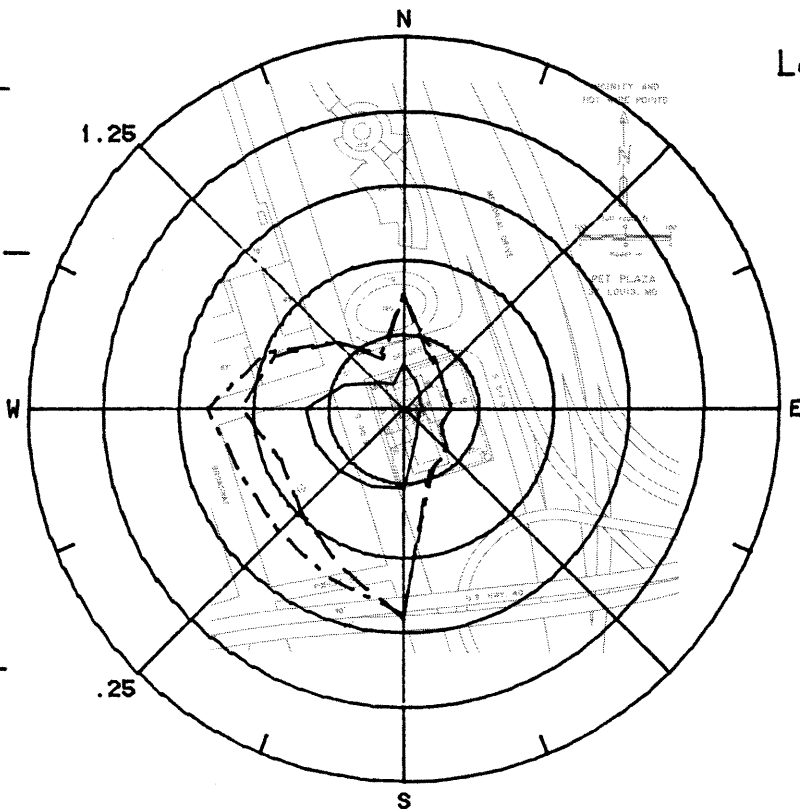
$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div

Figure 6n.  Mean Velocities and Turbulence Intensities
at Pedestrian Locations 9 and 10

GREENHOUSE ONLY

Umean ____
Uinf

Umean+
3*Urms ___ _ _
Uinf

.25/Div

Urms ___ _ _ _
Uinf

.05/Div

Location 11

Umean ____
Uinf

Umean+
3*Urms _ _ _ _
Uinf

.25/Div

Urms _ _ _
Uinf

.05/Div

Location 12

Figure 60. Mean Velocities and Turbulence Intensities
at Pedestrian Locations 11 and 12

GREENHOUSE ONLY

$$\frac{Umean}{Uinf}$$ _____

Location 13

$$\frac{Umean+}{3*Urms}$$ _ ._ _
$$\overline{Uinf}$$

.25/Div

$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div

$$\frac{Umean}{Uinf}$$ _____

Location 14

$$\frac{Umean+}{3*Urms}$$ _ ._ _
$$\overline{Uinf}$$

.25/Div

$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div

Figure 6p.   Mean Velocities and Turbulence Intensities
at Pedestrian Locations 13 and 14

GREENHOUSE ONLY

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+}{3*Urms}$$
$$\frac{}{Uinf}$$ _ ._ _

.25/Div

$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div

Location 17

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+}{3*Urms}$$
$$\frac{}{Uinf}$$ _ ._ _

.25/Div

$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div

Location 18

Figure 6q.   Mean Velocities and Turbulence Intensities
at Pedestrian Locations 17 and 18

GREENHOUSE ONLY

Location 20

$$\frac{Umean}{Uinf}$$ ____

$$\frac{Umean+}{Uinf}$$ _ . _
3*Urms

.25/Div

$$\frac{Urms}{Uinf}$$ _ _

.05/Div

Figure 6r.  Mean Velocities and Turbulence Intensities
at Pedestrian Location 20

GREENHOUSE AND NORTH WALL

Location 3

$$\frac{Umean}{Uinf} \quad \underline{\hspace{2cm}}$$

$$\frac{Umean+3*Urms}{Uinf} \quad \underline{\cdot}\,\underline{\cdot}\,\underline{\cdot}$$

.25/Div

$$\frac{Urms}{Uinf} \quad \underline{\hspace{0.5cm}}\ \underline{\hspace{0.5cm}}$$

.05/Div

Location 4

$$\frac{Umean}{Uinf} \quad \underline{\hspace{2cm}}$$

$$\frac{Umean+3*Urms}{Uinf} \quad \underline{\cdot}\,\underline{\cdot}\,\underline{\cdot}$$

.25/Div

$$\frac{Urms}{Uinf} \quad \underline{\hspace{0.5cm}}\ \underline{\hspace{0.5cm}}$$
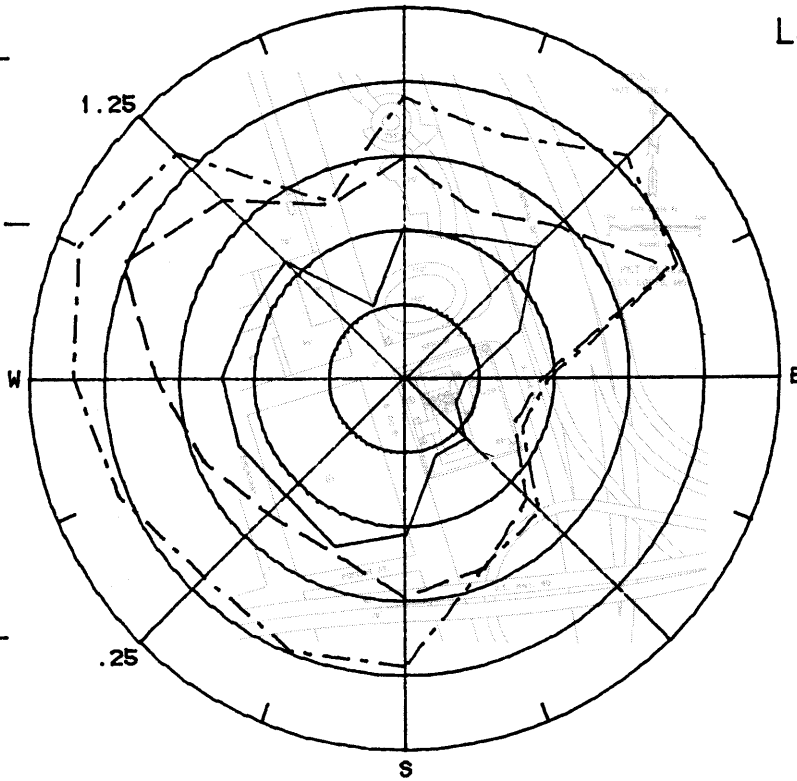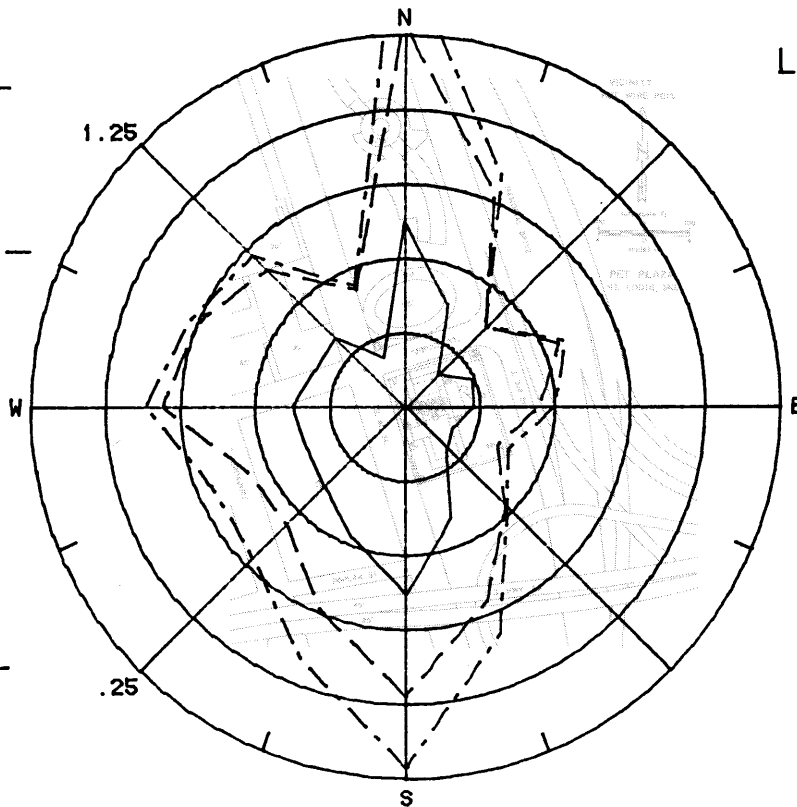
.05/Div

Figure 6s. Mean Velocities and Turbulence Intensities at Pedestrian Locations 3 and 4

GREENHOUSE AND NORTH WALL

Location 5

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ _ . _

.25/Div
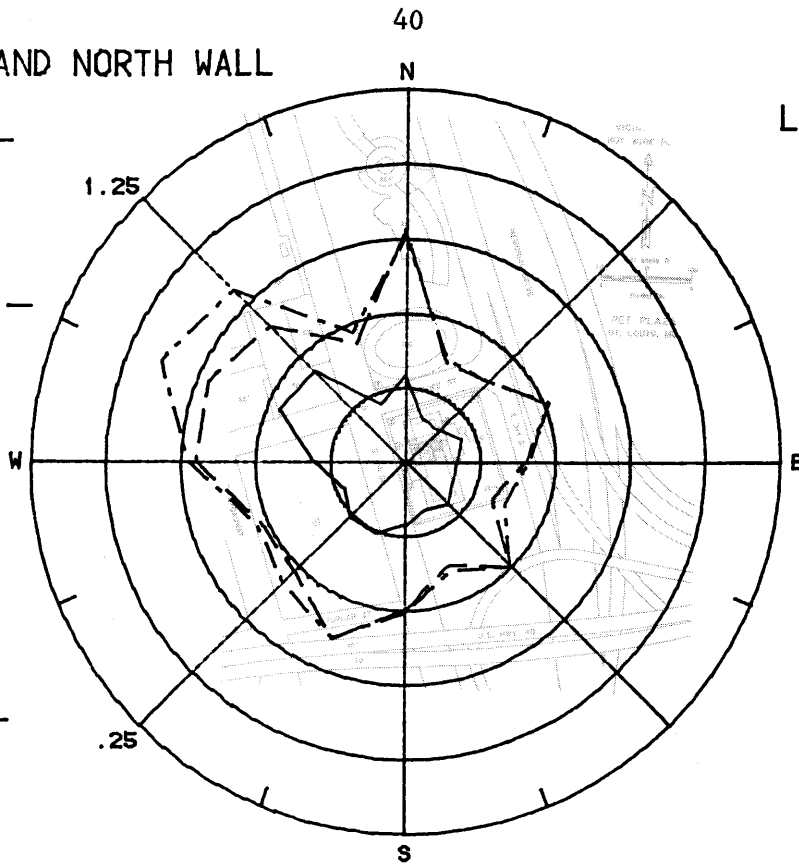
$$\frac{Urms}{Uinf}$$ _ _

.05/Div

Location 8

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+3*Urms}{Uinf}$$ _ . _

.25/Div
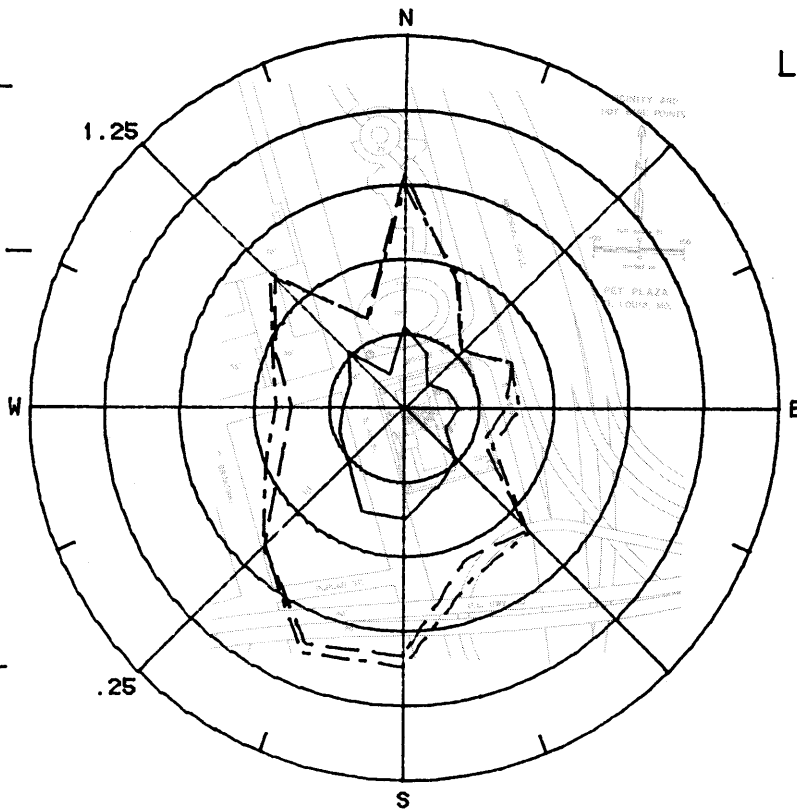
$$\frac{Urms}{Uinf}$$ _ _

.05/Div

Figure 6t.    Mean Velocities and Turbulence Intensities
at Pedestrian Locations 5 and 8

GREENHOUSE AND NORTH WALL

Location 9

$$\frac{Umean}{Uinf}$$ ____

$$\frac{Umean+3*Urms}{Uinf}$$ _ . _ . _

.25/Div

$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div



$$\frac{Umean}{Uinf}$$ ____
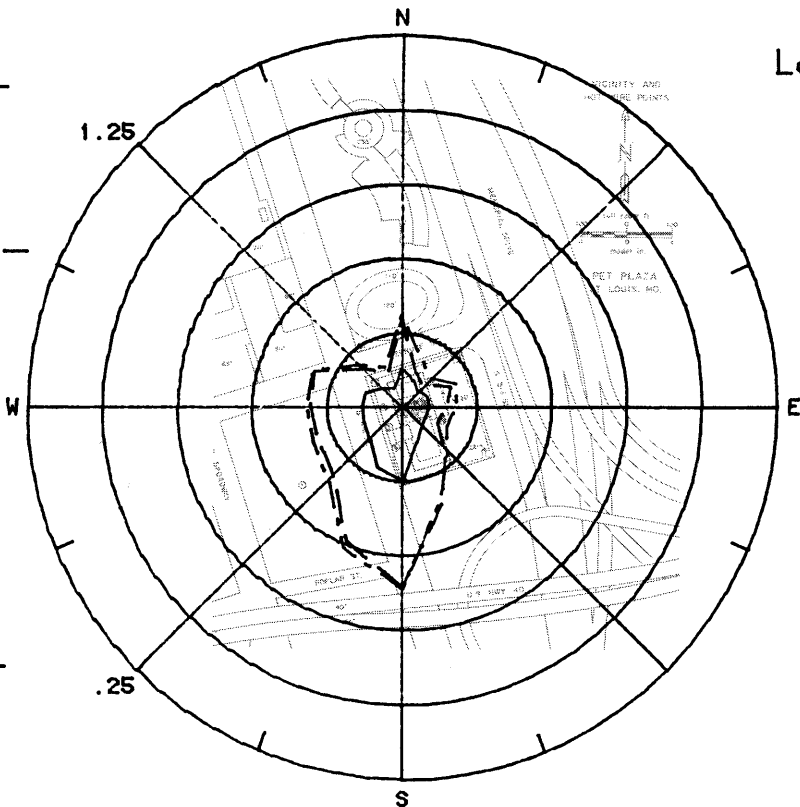
Location 10

$$\frac{Umean+3*Urms}{Uinf}$$ _ . _ . _

.25/Div

$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div



Figure 6u.  Mean Velocities and Turbulence Intensities
at Pedestrian Locations 9 and 10

GREENHOUSE AND NORTH WALL

Location 11

$$\frac{Umean}{Uinf} \underline{\qquad}$$

$$\frac{Umean+}{3*Urms} \underline{\qquad} \cdot \underline{\qquad}$$
$$Uinf$$

.25/Div

$$\frac{Urms}{Uinf} \underline{\qquad} \underline{\qquad}$$

.05/Div

Location 12

$$\frac{Umean}{Uinf} \underline{\qquad}$$

$$\frac{Umean+}{3*Urms} \underline{\qquad} \cdot \underline{\qquad}$$
$$Uinf$$

.25/Div

$$\frac{Urms}{Uinf} \underline{\qquad} \underline{\qquad}$$

.05/Div

Figure 6y.    Mean Velocities and Turbulence Intensities
at Pedestrian Locations 11 and 12

GREENHOUSE AND NORTH WALL

Location 13

Location 14

Figure 6w.  Mean Velocities and Turbulence Intensities
at Pedestrian Locations 13 and 14

GREENHOUSE AND NORTH WALL

$$\frac{Umean}{Uinf} \text{ ———}$$

$$\frac{Umean+}{3*Urms} \text{ —·—}$$
$$\frac{}{Uinf}$$

.25/Div

$$\frac{Urms}{Uinf} \text{ — —}$$

.05/Div

Location 17

1.25

N

W — E

.25

S

$$\frac{Umean}{Uinf} \text{ ———}$$

$$\frac{Umean+}{3*Urms} \text{ —·—}$$
$$\frac{}{Uinf}$$

.25/Div

$$\frac{Urms}{Uinf} \text{ — —}$$

.05/Div

Location 18

N

1.25

W — E

.25

S

Figure 6x.   Mean Velocities and Turbulence Intensities
at Pedestrian Locations 17 and 18

GREENHOUSE AND NORTH WALL

45

N

Location 20

Umean ____
Uinf

1.25

Umean+
3*Urms  _ . _
Uinf

.25/Div

W                                                    E

Urms  _ _
Uinf

.25

.05/Div

S

Figure 6y. Mean Velocities and Turbulence Intensities
at Pedestrian Location 20

GREENHOUSE AND CANOPY

$$\frac{Umean}{Uinf}$$ ____

$$\frac{Umean+}{3*Urms}$$ _ . _
$$\overline{Uinf}$$

.25/Div

$$\frac{Urms}{Uinf}$$ _ _

.05/Div

Location 3

1.25

N

W     E

.25

S

$$\frac{Umean}{Uinf}$$ ____

$$\frac{Umean+}{3*Urms}$$ _ . _
$$\overline{Uinf}$$

.25/Div

$$\frac{Urms}{Uinf}$$ _ _

.05/Div

Location 4

1.25

N

W     E

.25
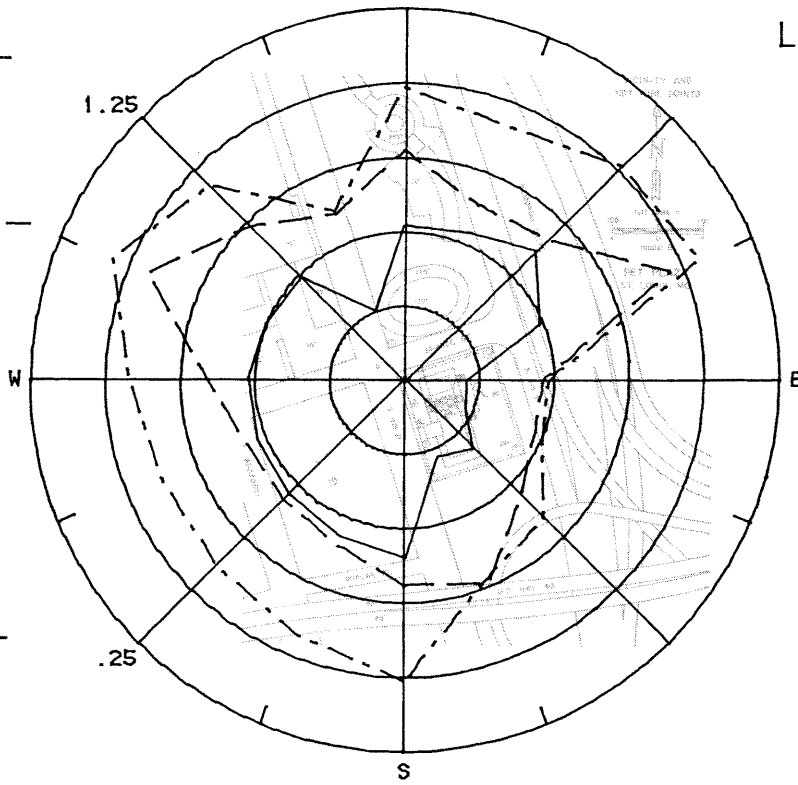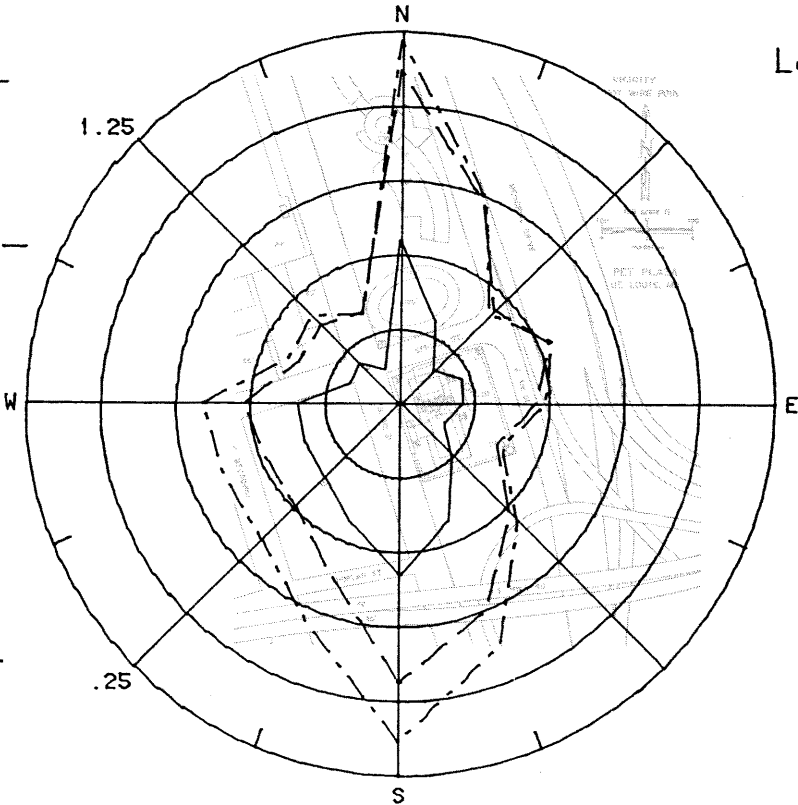
S

Figure 6z. Mean Velocities and Turbulence Intensities
at Pedestrian Locations 3 and 4

GREENHOUSE AND CANOPY
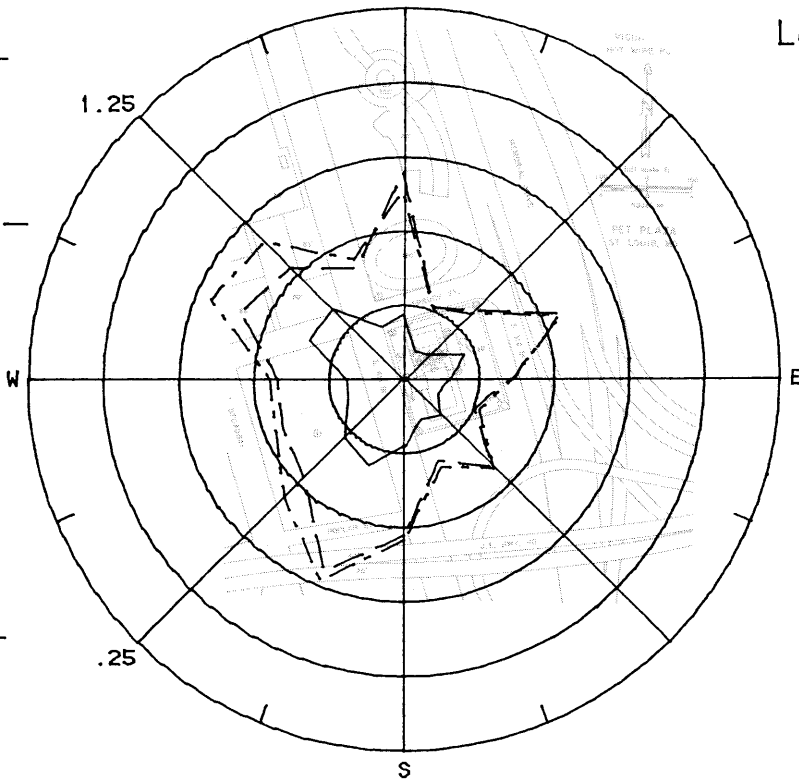
$$\frac{Umean}{Uinf}$$ _____

Location 5

$$\frac{Umean+3*Urms}{Uinf}$$ _ _ _

.25/Div

$$\frac{Urms}{Uinf}$$ _ _

.05/Div

$$\frac{Umean}{Uinf}$$ _____
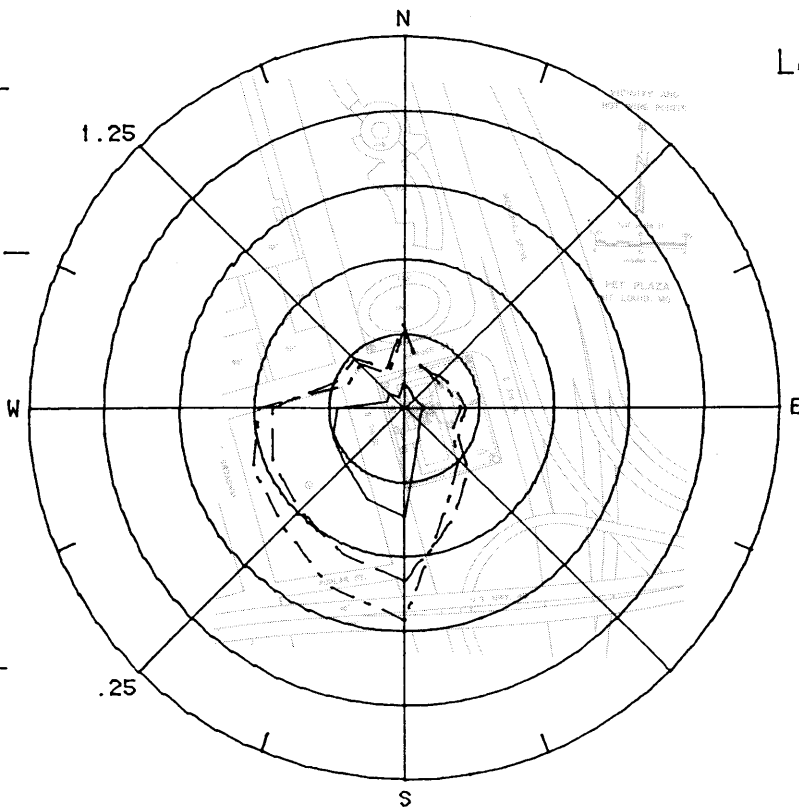
Location 8

$$\frac{Umean+3*Urms}{Uinf}$$ _ _

.25/Div

$$\frac{Urms}{Uinf}$$ _ _

.05/Div

Figure 6aa.  Mean Velocities and Turbulence Intensities
at Pedestrian Locations 5 and 8

GREENHOUSE AND CANOPY
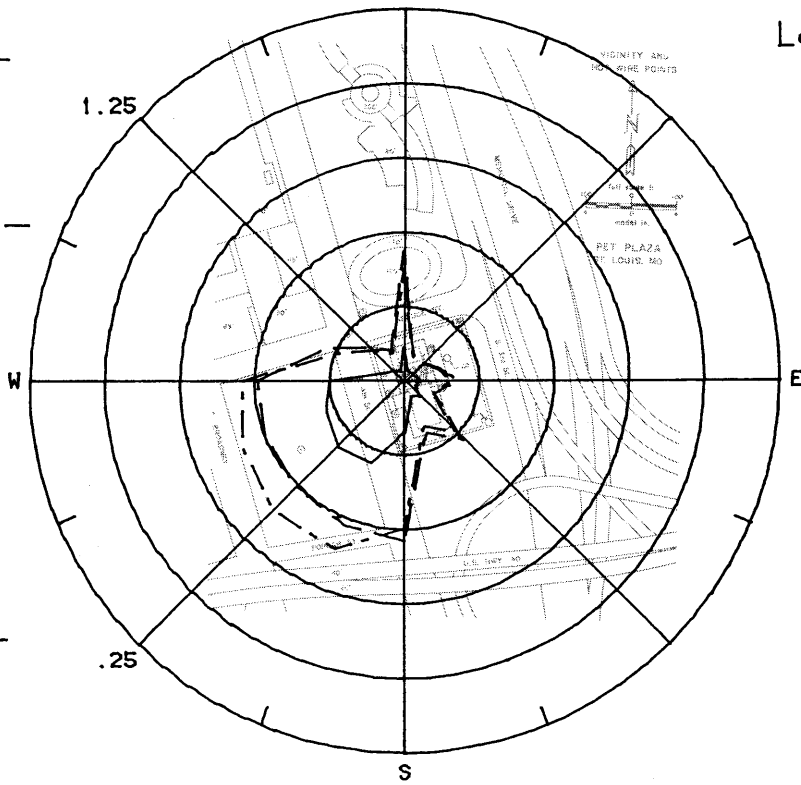
Location 9

$$\frac{Umean}{Uinf}$$ ____

$$\frac{Umean+3*Urms}{Uinf}$$ _ . _

.25/Div

$$\frac{Urms}{Uinf}$$ _ _

.05/Div

Location 10
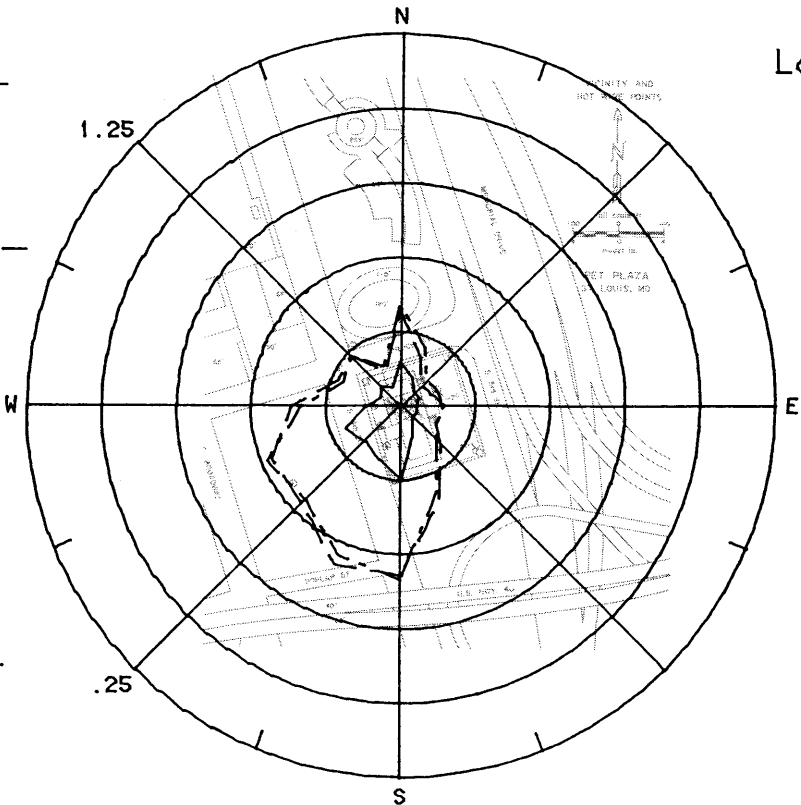
$$\frac{Umean}{Uinf}$$ ____

$$\frac{Umean+3*Urms}{Uinf}$$ _ . _

.25/Div

$$\frac{Urms}{Uinf}$$ _ _

.05/Div

Figure 6bb.   Mean Velocities and Turbulence Intensities
at Pedestrian Locations 9 and 10

# GREENHOUSE AND CANOPY

Location 11

Umean / Uinf ———
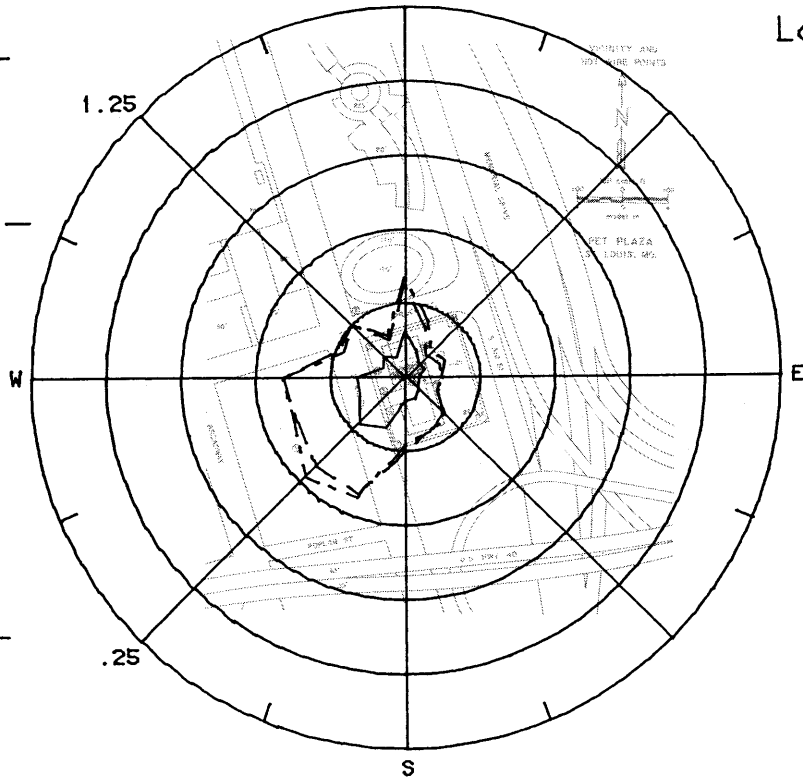
Umean+ 3*Urms / Uinf — · —

.25/Div

Urms / Uinf — —

.05/Div

Location 12

Umean / Uinf ———
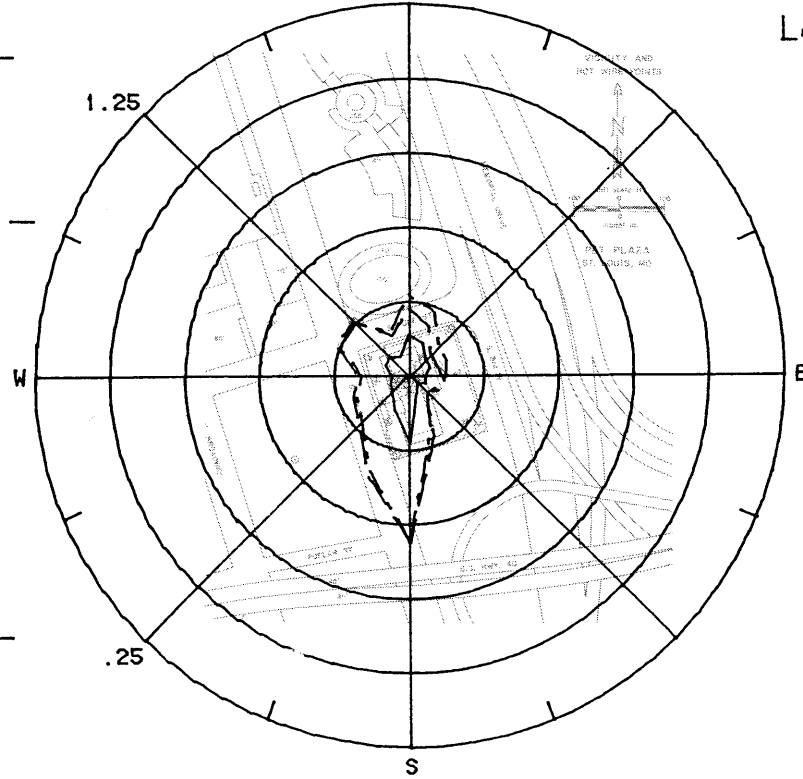
Umean+ 3*Urms / Uinf — · —

.25/Div

Urms / Uinf — —

.05/Div

Figure 6cc.  Mean Velocities and Turbulence Intensities
at Pedestrian Locations 11 and 12

GREENHOUSE AND CANOPY

Location 13

$\dfrac{Umean}{Uinf}$ ——

$\dfrac{Umean+3*Urms}{Uinf}$ — · —

.25/Div

$\dfrac{Urms}{Uinf}$ — —

.05/Div

50
N
1.25
W
E
.25
S

Location 14

$\dfrac{Umean}{Uinf}$ ——

$\dfrac{Umean+3*Urms}{Uinf}$ — · —
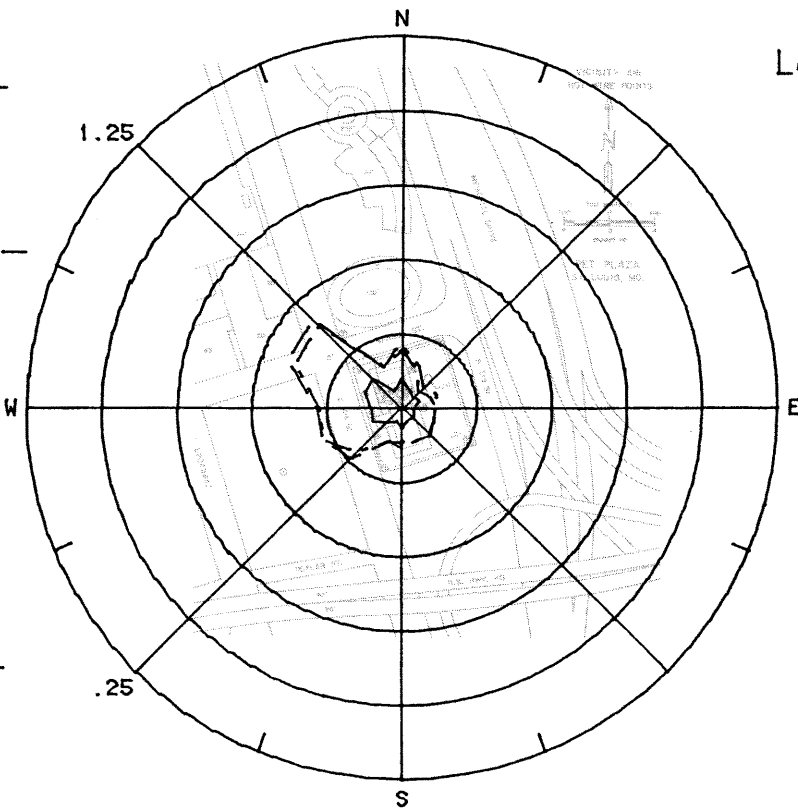
.25/Div

$\dfrac{Urms}{Uinf}$ — —

.05/Div

N
1.25
W
E
.25
S

Figure 6dd.   Mean Velocities and Turbulence Intensities
at Pedestrian Locations 13 and 14
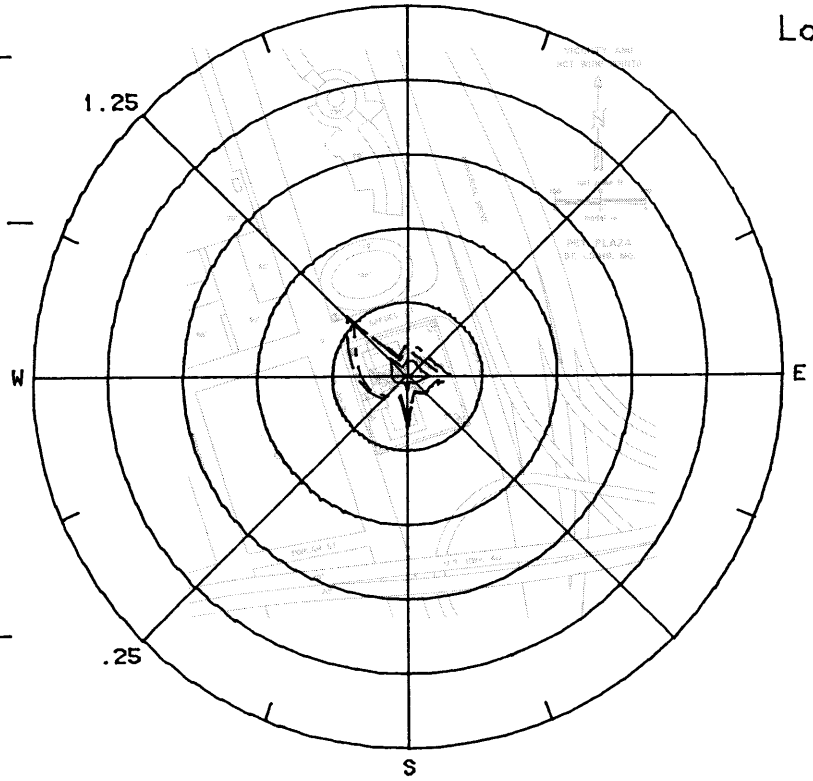
GREENHOUSE AND CANOPY



Figure 6ee.   Mean Velocities and Turbulence Intensities
at Pedestrian Locations 17 and 18

GREENHOUSE AND CANOPY

Location 20

$$\frac{Umean}{Uinf}$$ _____

$$\frac{Umean+}{3*Urms}$$
$$\frac{}{Uinf}$$ _ _ . _

.25/Div

$$\frac{Urms}{Uinf}$$ _ _ _

.05/Div

Figure 6ff.  Mean Velocities and Turbulence Intensities
at Pedestrian Location 20
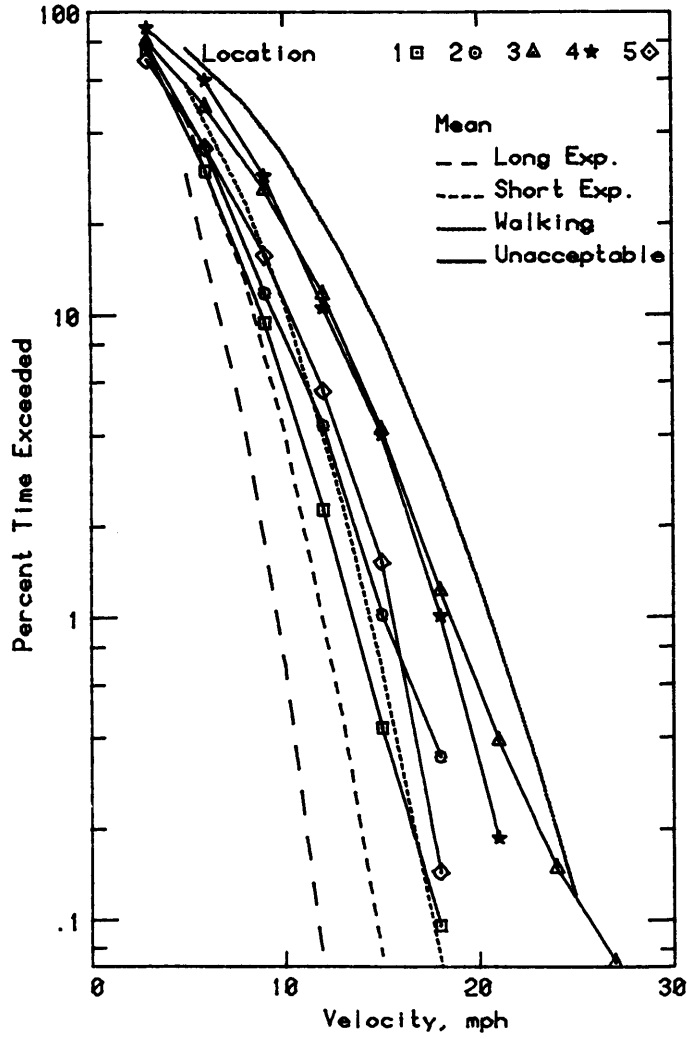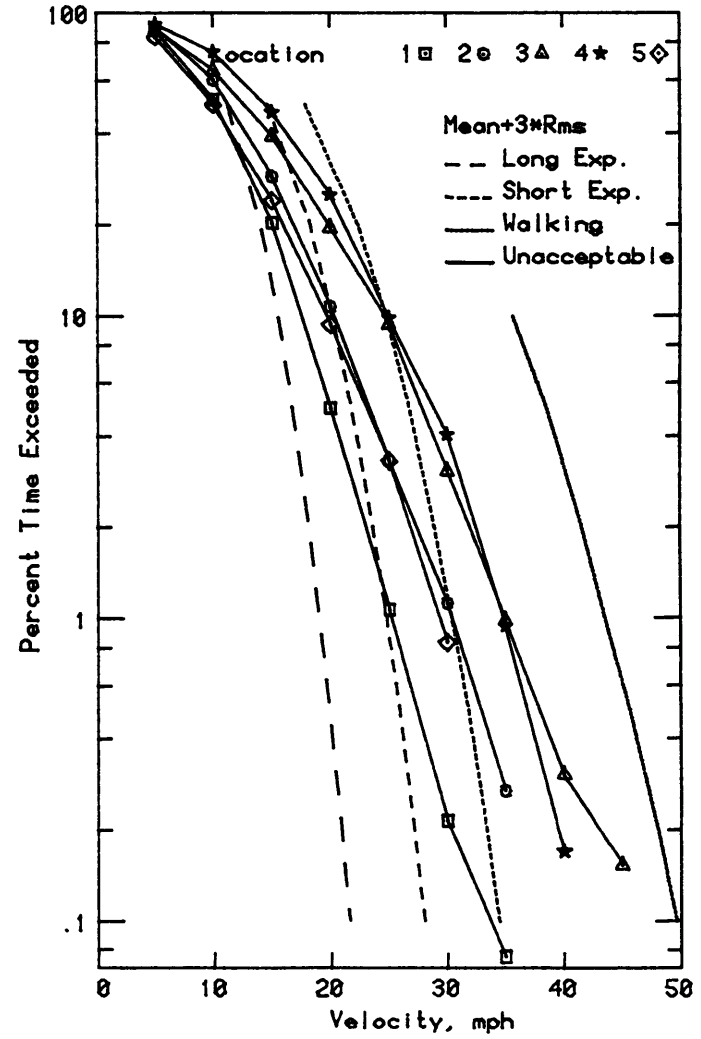
Figure 7a. Wind Velocity Probabilities for Pedestrian Locations
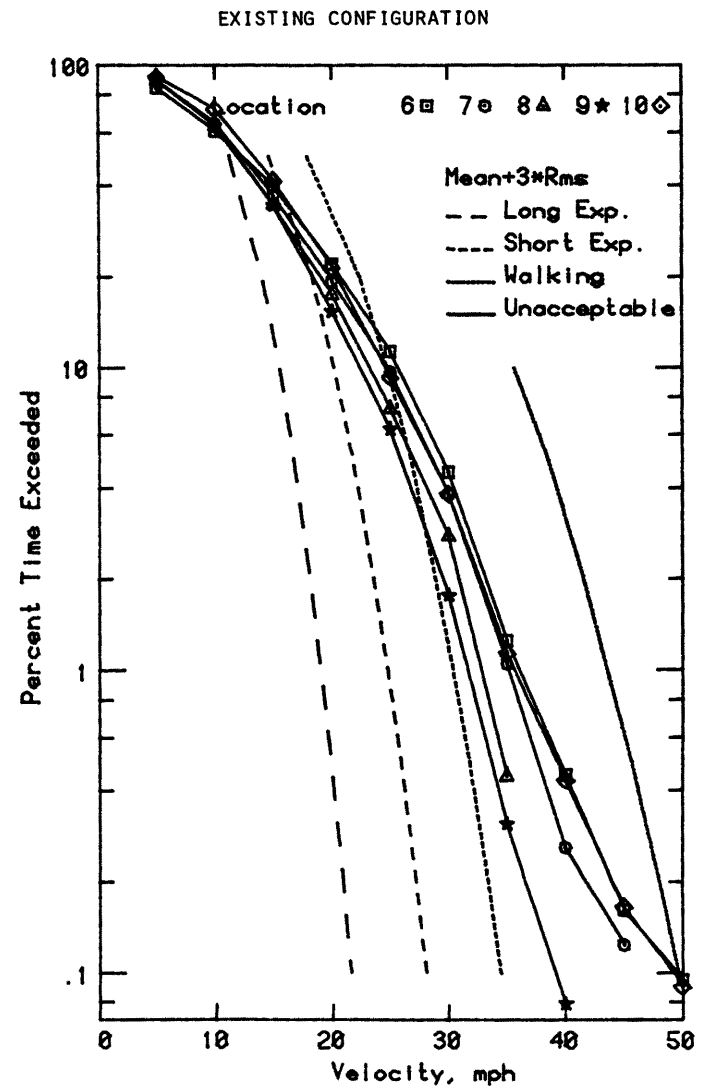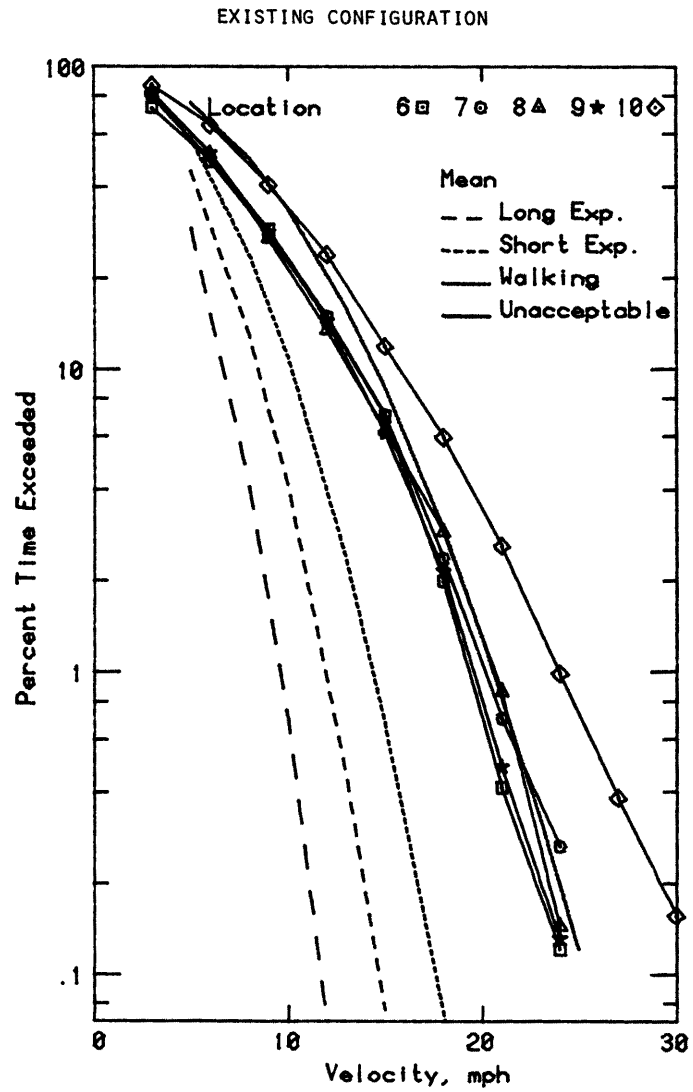
Figure 7b. Wind Velocity Probabilities for Pedestrian Locations

Location    11□ 12⊙ 13△ 14★ 15◇

Mean
  ── Long Exp.
  ---- Short Exp.
  ──── Walking
  ──── Unacceptable

Location    11□ 12⊙ 13△ 14★ 15◇

Mean+3*Rms
  ── Long Exp.
  ---- Short Exp.
  ──── Walking
  ──── Unacceptable

Percent Time Exceeded
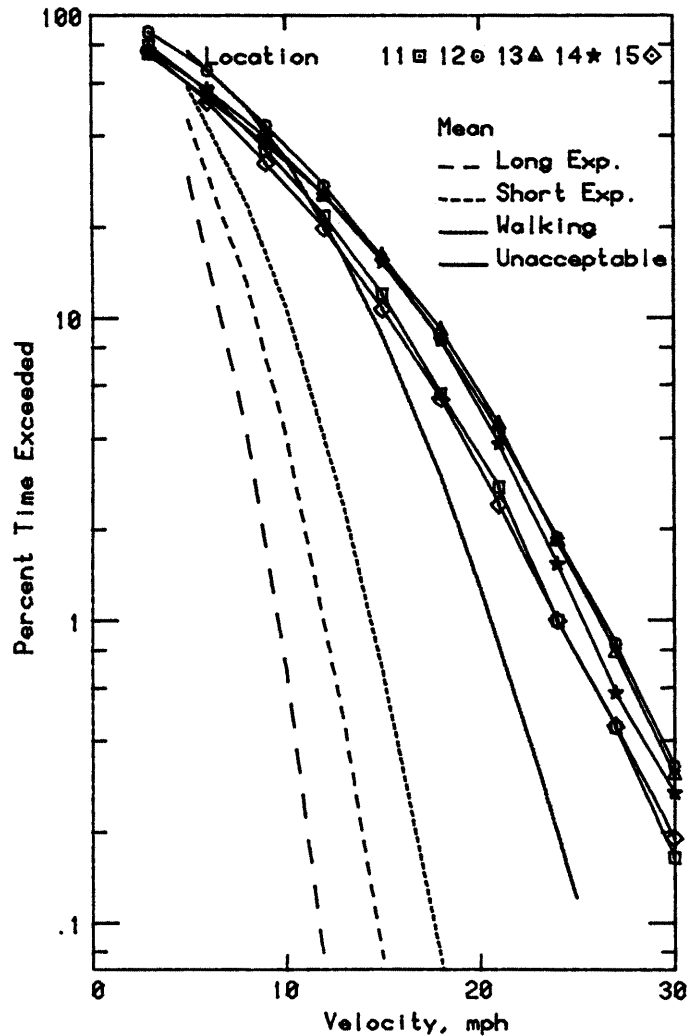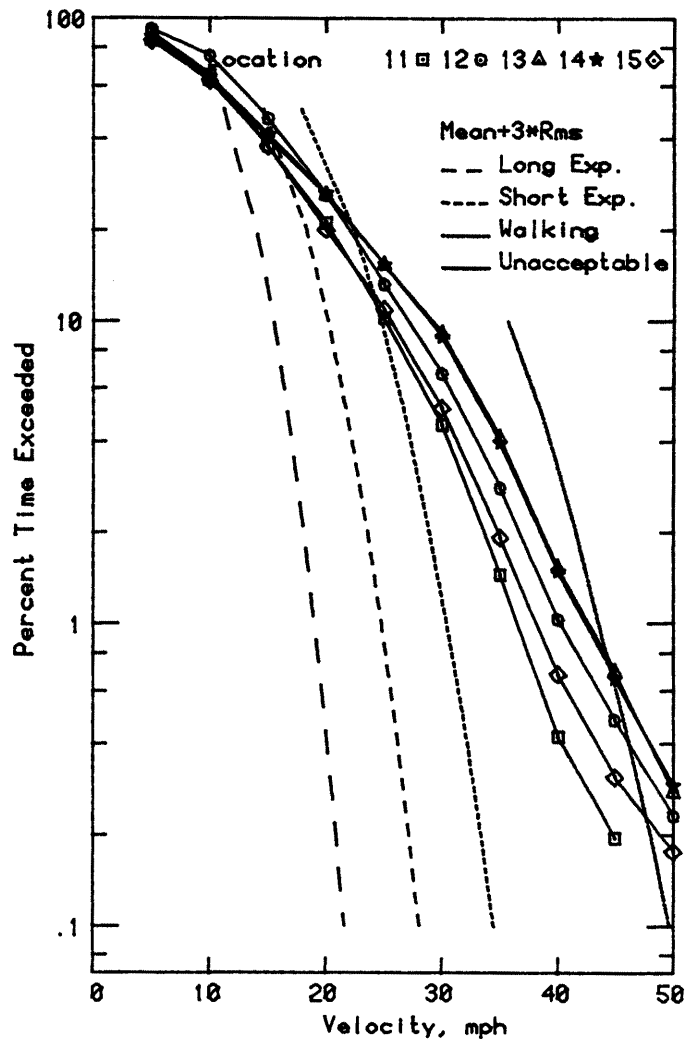
Velocity, mph

Figure 7c.  Wind Velocity Probabilities for Pedestrian Locations

55
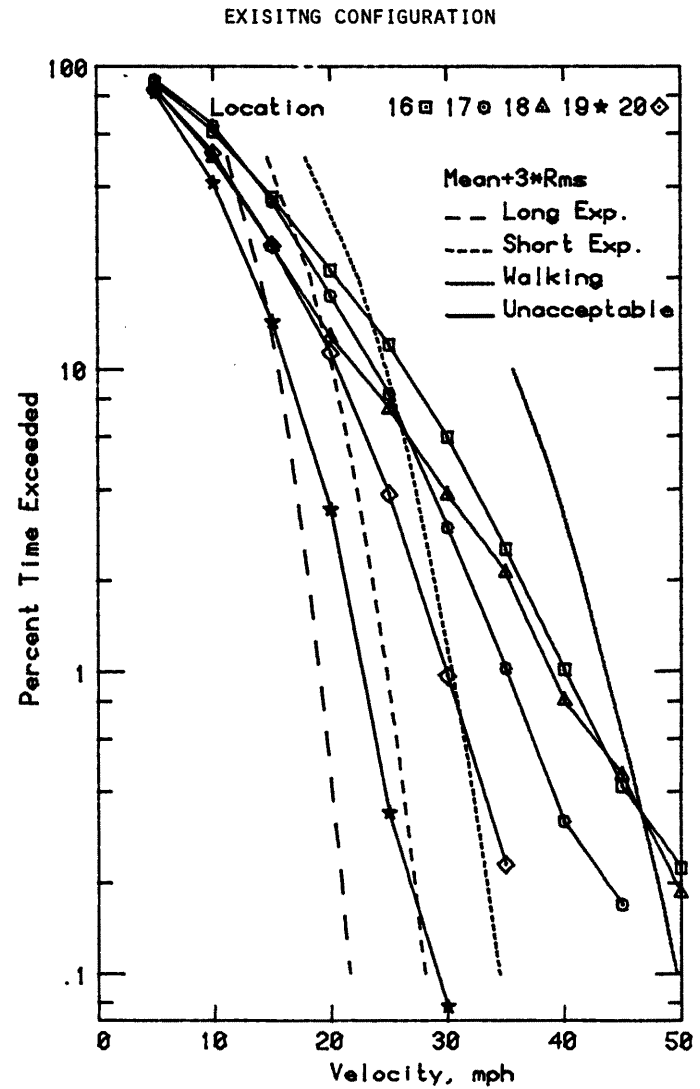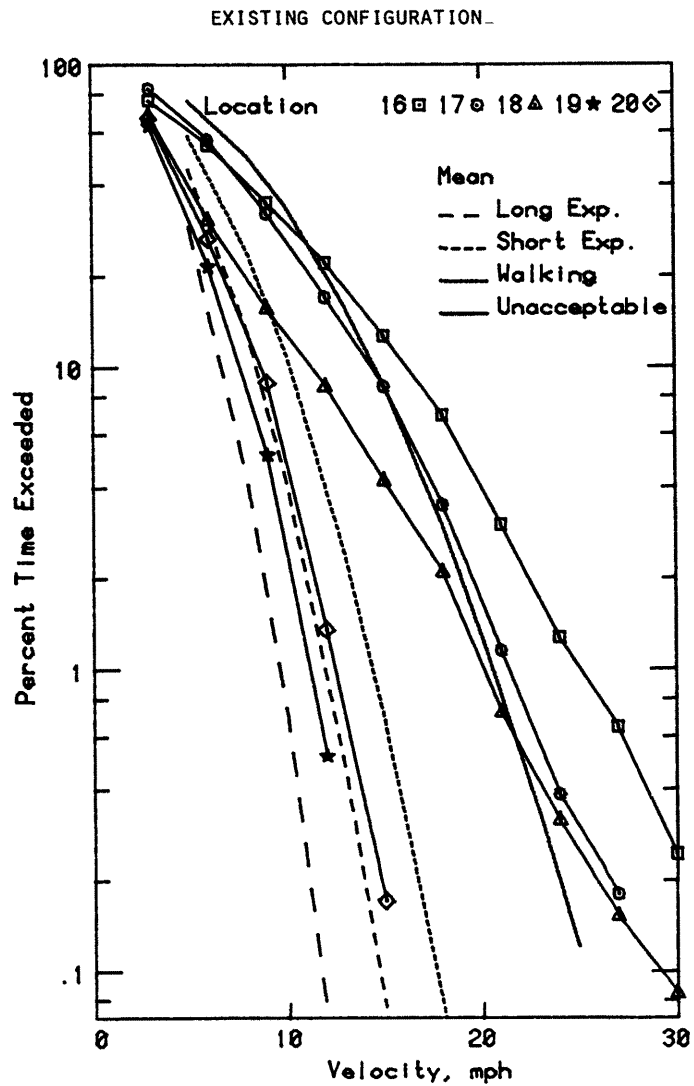
Figure 7d.   Wind Velocity Probabilities for Pedestrian Locations
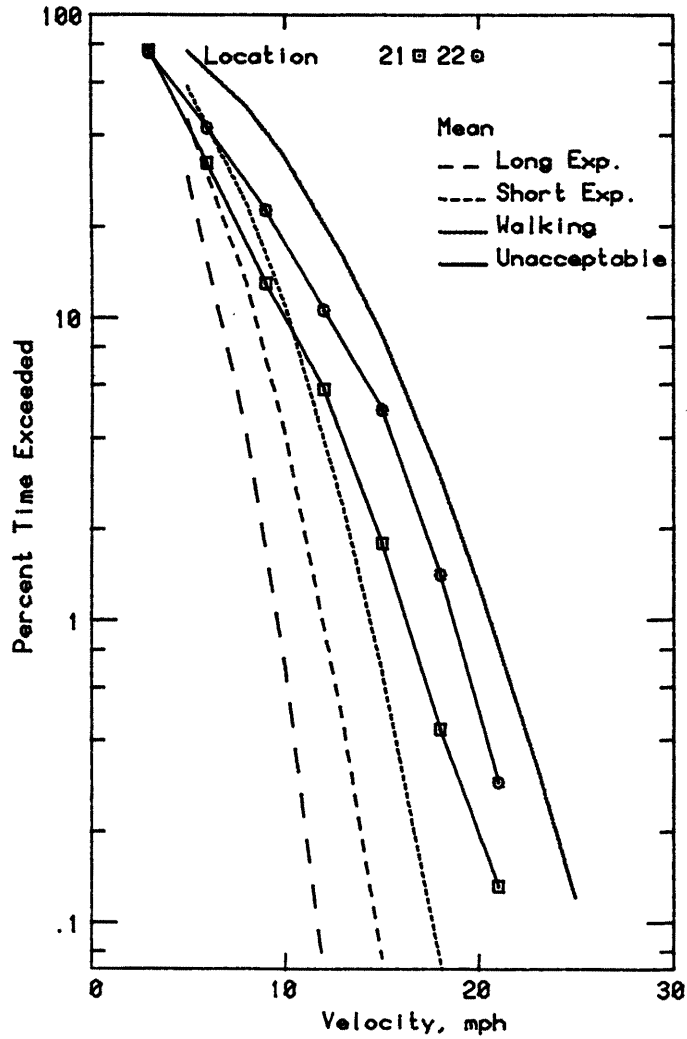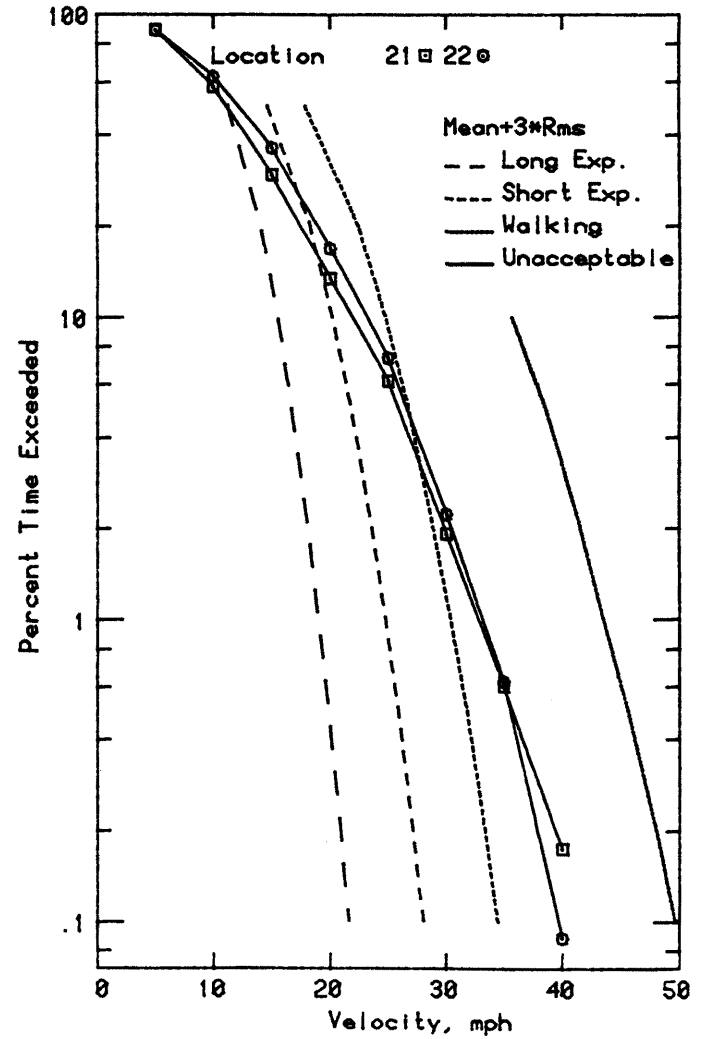
Figure 7e.   Wind Velocity Probabilities for Pedestrian Locations
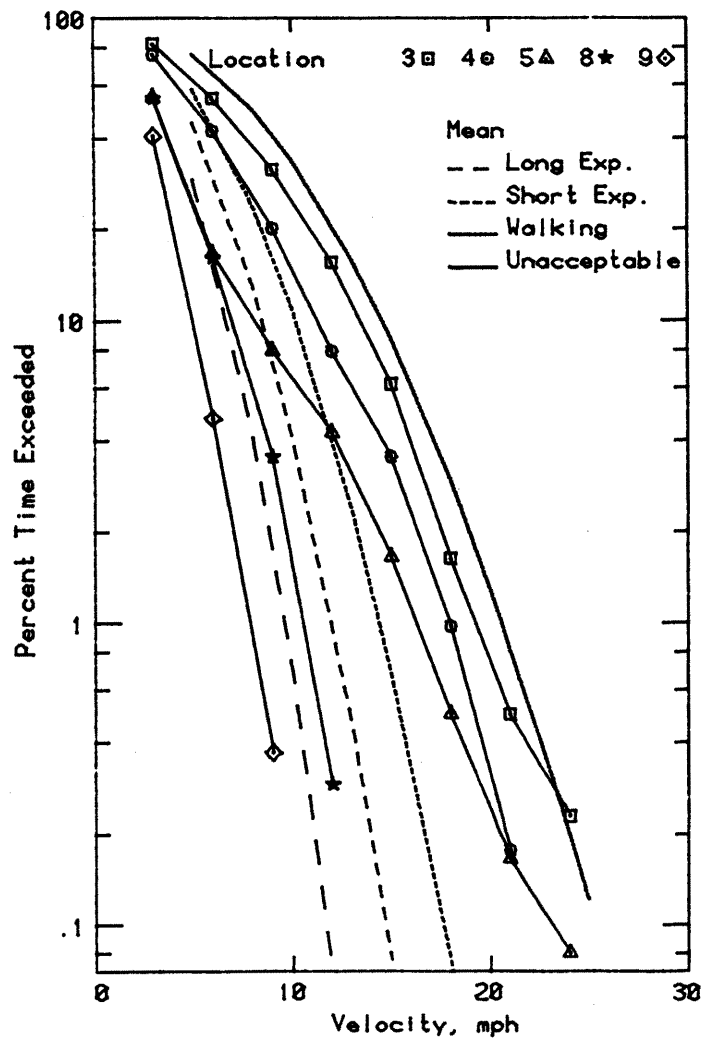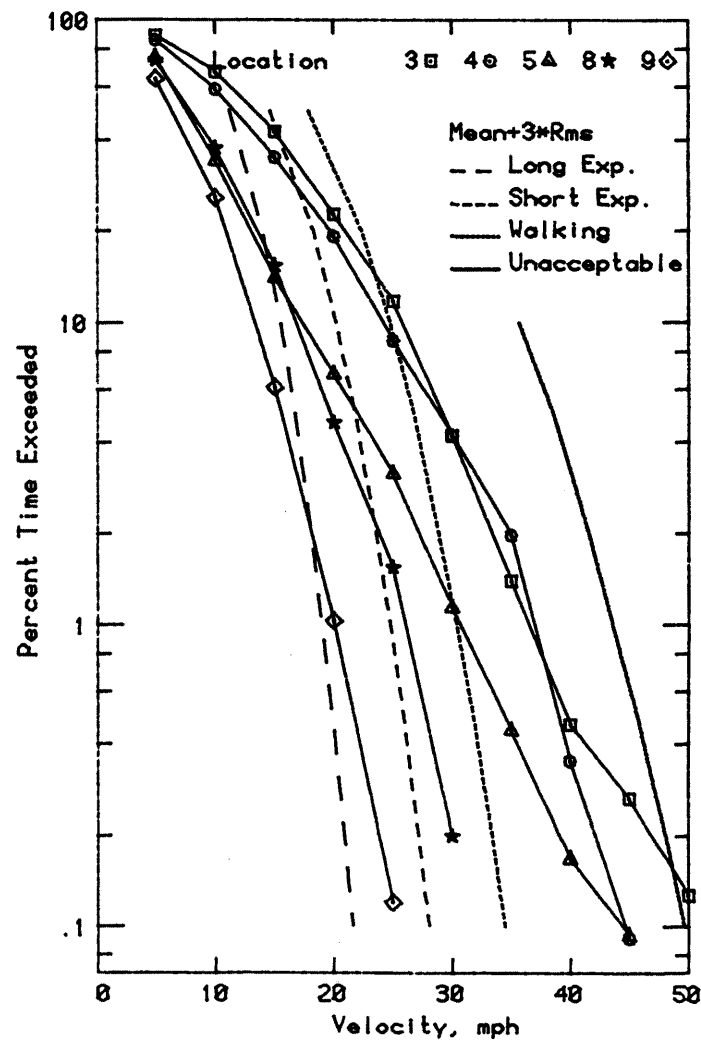
Figure 7f. Wind Velocity Probabilities for Pedestrian Locations

58
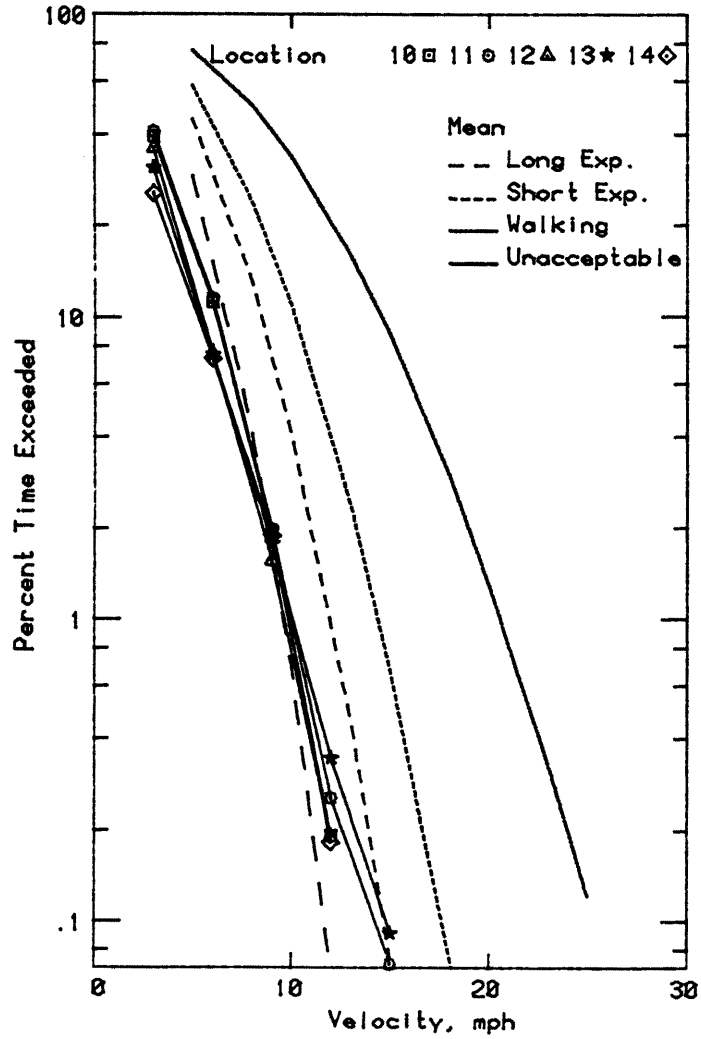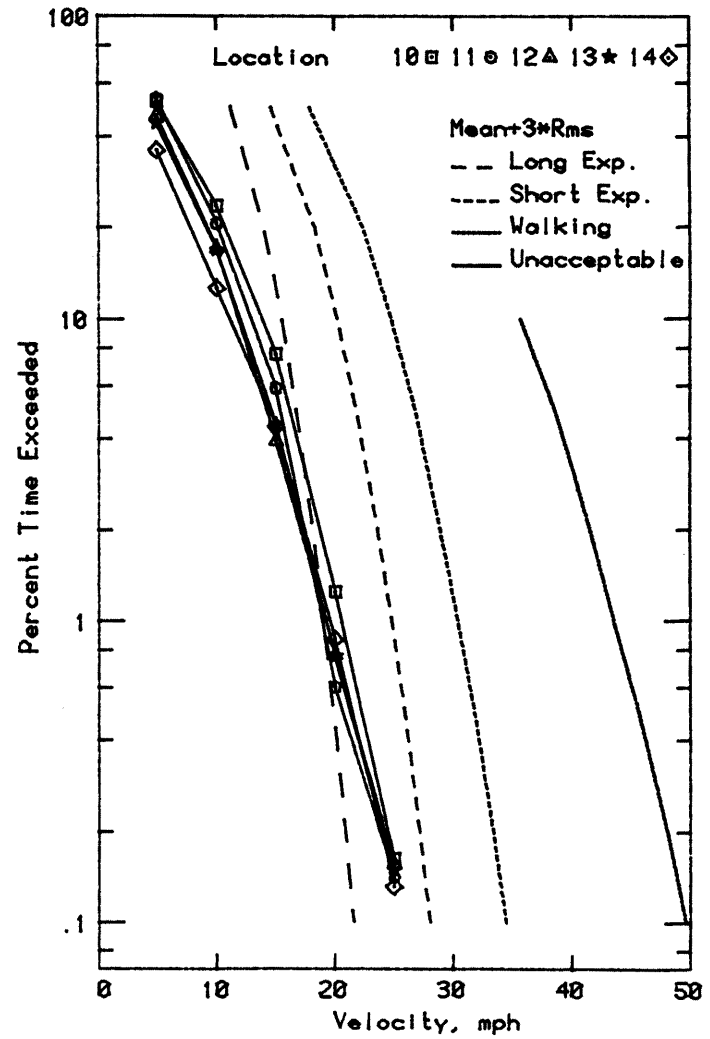
Figure 7g.  Wind Velocity Probabilities for Pedestrian Locations
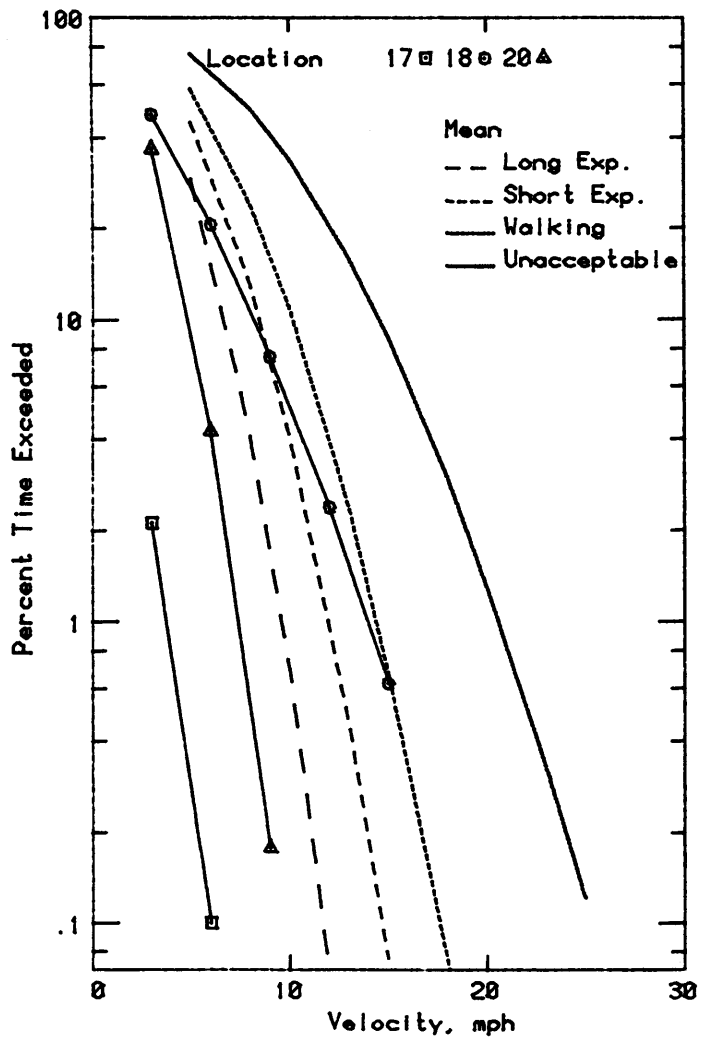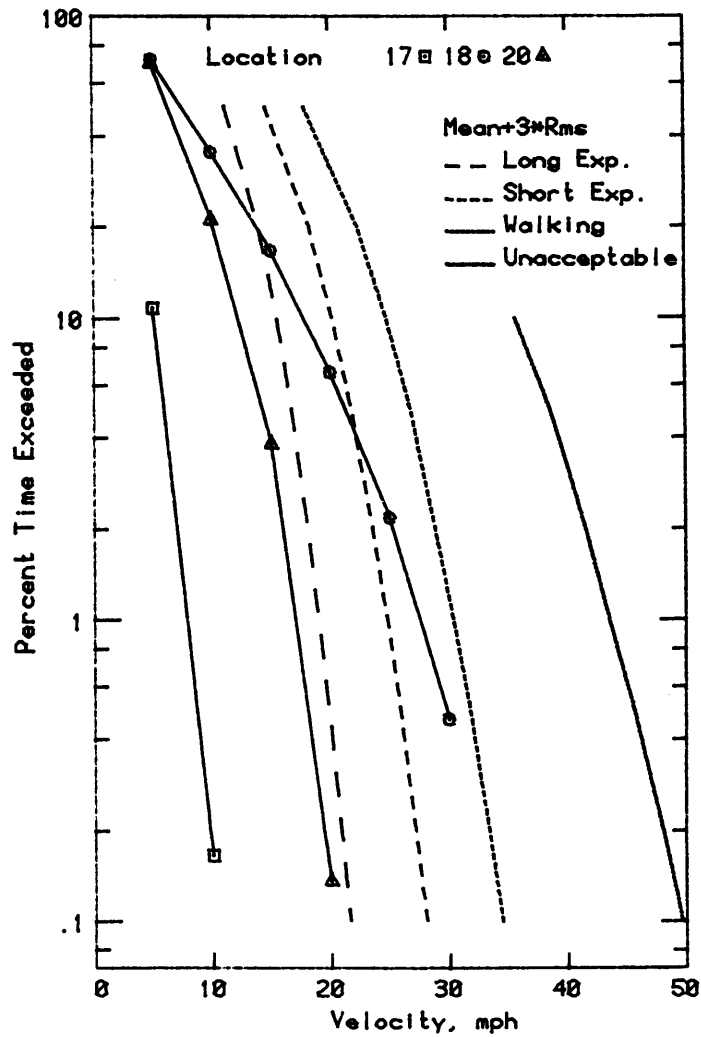
Figure 7h. Wind Velocity Probabilities for Pedestrian Locations

Figure 7i. Wind Velocity Probabilities for Pedestrian Locations

Figure 7j.  Wind Velocity Probabilities for Pedestrian Locations
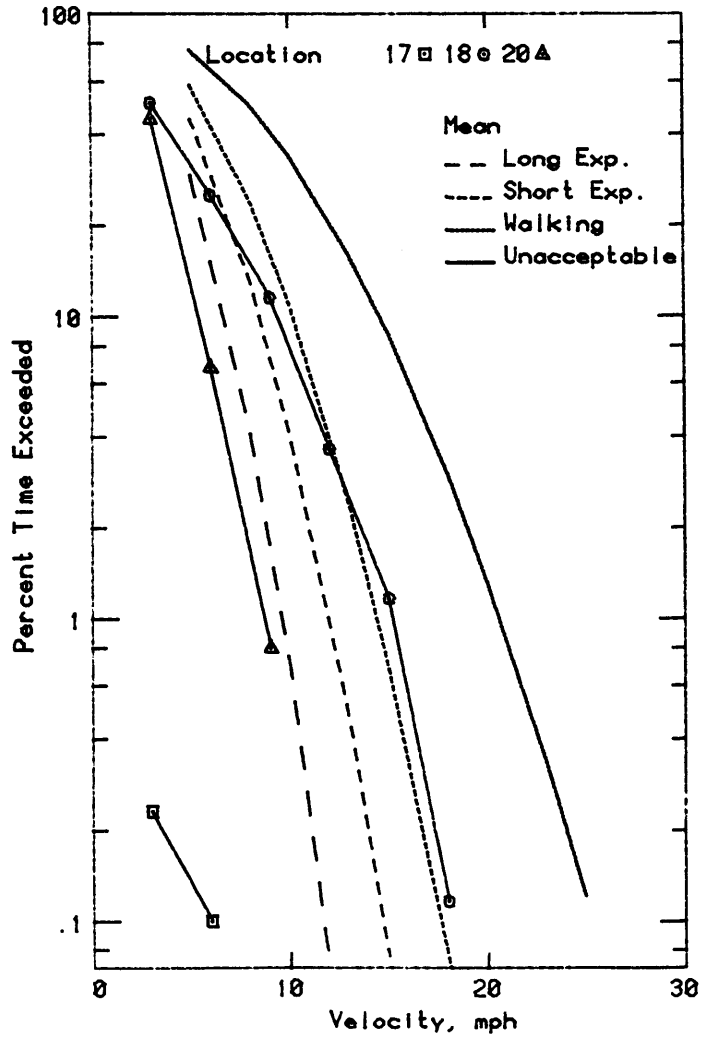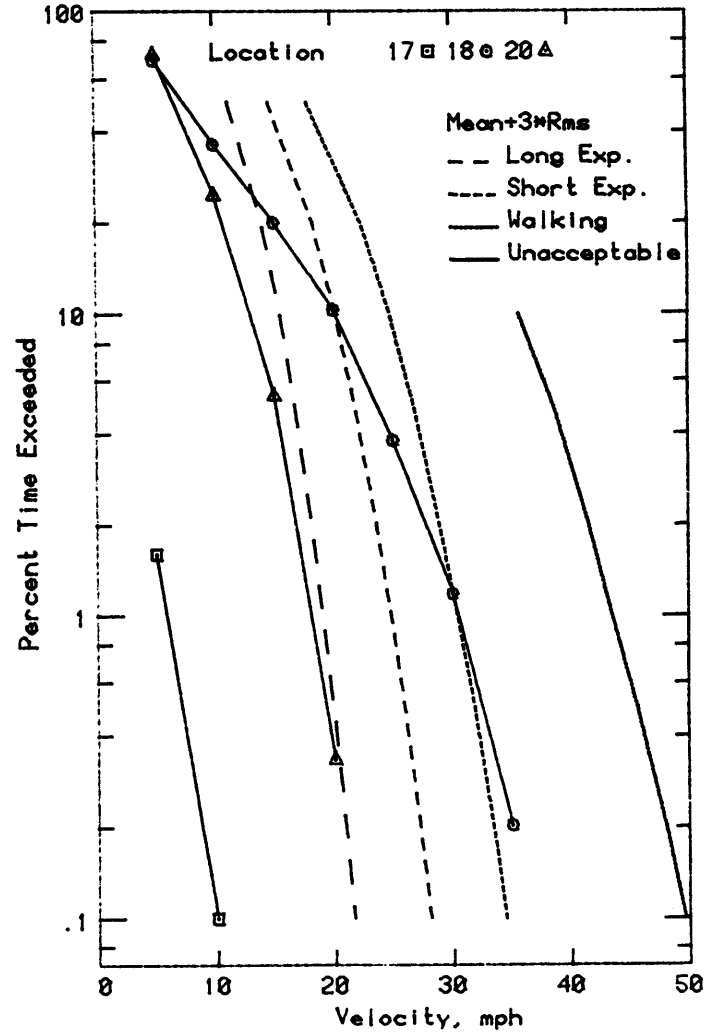
Figure 7k. Wind Velocity Probabilities for Pedestrian Locations

63
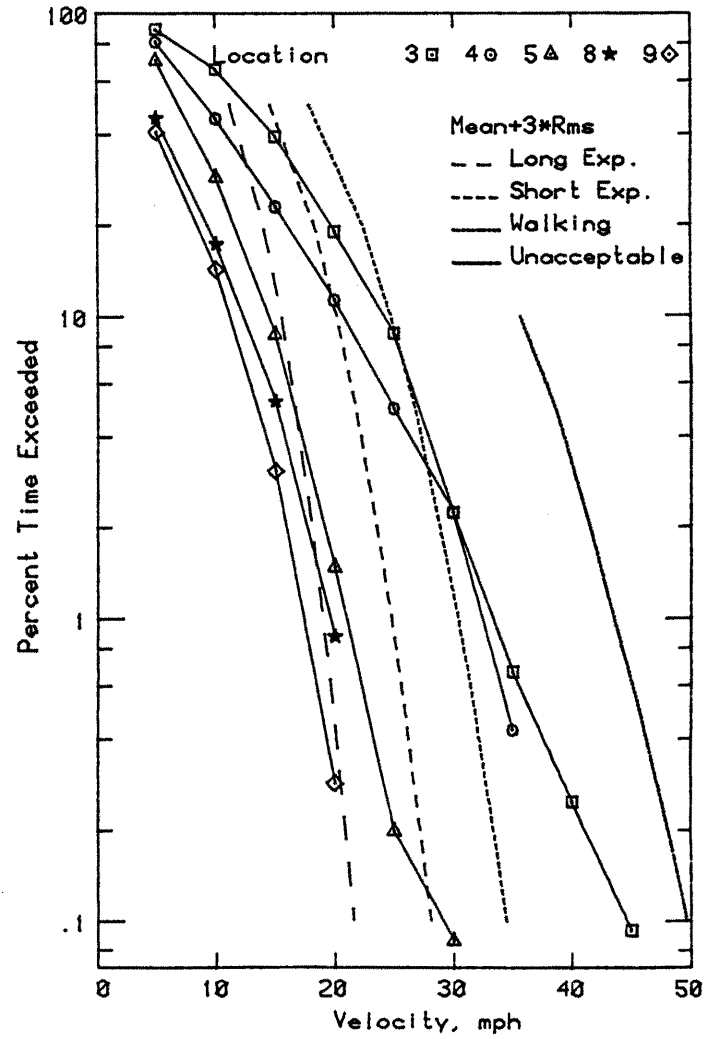
Figure 71.  Wind Velocity Probabilities for Pedestrian Locations
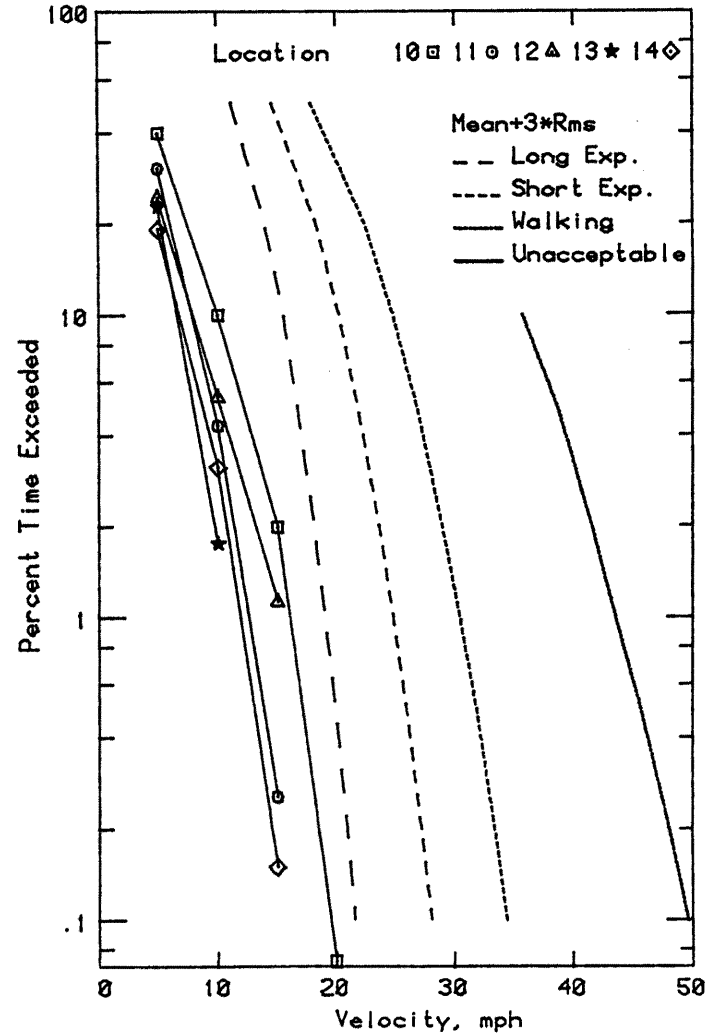
Figure 7m.  Wind Velocity Probabilities for Pedestrian Locations
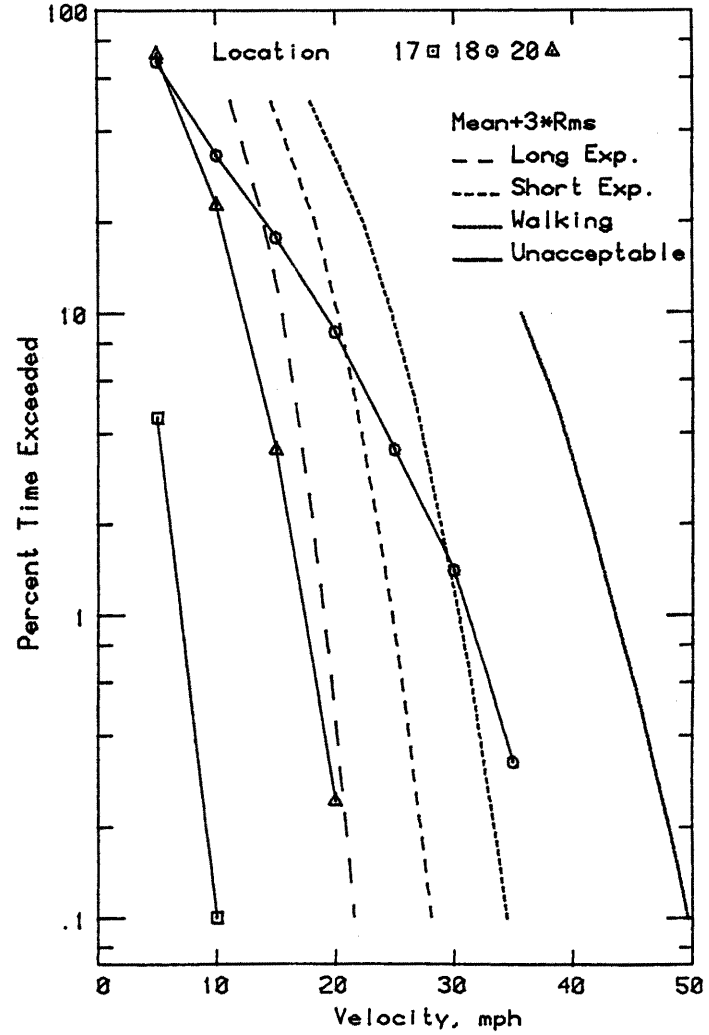
Figure 7n. Wind Velocity Probabilities for Pedestrian Locations

**TABLES**

TABLE 1

PERCENTAGE FREQUENCY OF WIND DIRECTION AND SPEED

ST. LOUIS, MISSOURI                    INT. ARPRT (1965-1974)

SEASON : ANNUAL        NO. OF OBS.= 29215     HT. OF MEAS.=  20. FT.

VELOCITY LEVELS IN MPH

| DIRECTION | 0- 3 | 4- 7 | 8-12 | 13-18 | 19-24 | 25-31 | 32 + | TOTAL |
|---|---|---|---|---|---|---|---|---|
| N | .20 | 1.10 | 2.10 | 1.40 | .10 | 0.00 | 0.00 | 4.90 |
| NNE | .30 | 1.30 | 1.20 | .40 | 0.00 | 0.00 | 0.00 | 3.30 |
| NE | .30 | 1.20 | 1.00 | .30 | 0.00 | 0.00 | 0.00 | 2.80 |
| ENE | .30 | 1.10 | 1.10 | .40 | 0.00 | 0.00 | 0.00 | 2.90 |
| E | .40 | 2.50 | 2.10 | .70 | 0.00 | 0.00 | 0.00 | 5.70 |
| ESE | .50 | 2.50 | 2.20 | 1.00 | .10 | 0.00 | 0.00 | 6.20 |
| SE | .30 | 2.00 | 3.30 | 1.80 | .20 | 0.00 | 0.00 | 7.50 |
| SSE | .20 | 1.40 | 3.60 | 2.50 | .20 | 0.00 | 0.00 | 8.00 |
| S | .20 | 2.10 | 5.30 | 3.30 | .30 | 0.00 | 0.00 | 11.20 |
| SSW | .10 | 1.00 | 2.00 | .70 | 0.00 | 0.00 | 0.00 | 3.90 |
| SW | .20 | 1.40 | 2.00 | .80 | .10 | 0.00 | 0.00 | 4.50 |
| WSW | .30 | 2.00 | 2.20 | 1.20 | .20 | 0.00 | 0.00 | 5.80 |
| W | .60 | 2.90 | 3.40 | 2.30 | .60 | .20 | 0.00 | 10.00 |
| WNW | .30 | 1.70 | 2.90 | 3.30 | .60 | .20 | 0.00 | 9.10 |
| NW | .20 | 1.20 | 2.30 | 1.90 | .20 | 0.00 | 0.00 | 5.70 |
| NNW | .10 | .90 | 1.70 | 1.10 | .10 | 0.00 | 0.00 | 3.80 |
| CALM | 4.70 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.70 |
| TOT | 9.10 | 26.20 | 38.40 | 23.10 | 2.70 | .50 | 0.00 | 100.00 |

## TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
## PET PLAZA-EXISTING CONFIGURATION

LOCATION   1

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 23.5 | 14.8 | 67.8 |
| 22.50 | 55.6 | 16.5 | 105.0 |
| 45.00 | 26.6 | 15.8 | 73.9 |
| 67.50 | 28.8 | 13.2 | 68.4 |
| 90.00 | 32.4 | 16.8 | 82.7 |
| 112.50 | 50.3 | 11.6 | 85.0 |
| 135.00 | 15.5 | 7.9 | 39.3 |
| 157.50 | 33.4 | 9.1 | 60.6 |
| 180.00 | 36.6 | 8.7 | 62.7 |
| 202.50 | 31.2 | 10.7 | 63.3 |
| 225.00 | 29.4 | 11.2 | 63.0 |
| 247.50 | 34.7 | 11.5 | 69.3 |
| 270.00 | 42.4 | 12.6 | 80.1 |
| 292.50 | 18.6 | 13.7 | 59.8 |
| 315.00 | 22.1 | 13.2 | 61.8 |
| 337.50 | 21.6 | 12.9 | 60.3 |

LOCATION   2

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 19.4 | 11.9 | 55.0 |
| 22.50 | 17.4 | 10.5 | 49.1 |
| 45.00 | 18.7 | 11.9 | 54.2 |
| 67.50 | 53.9 | 25.7 | 131.0 |
| 90.00 | 69.2 | 16.2 | 117.8 |
| 112.50 | 45.3 | 8.9 | 72.1 |
| 135.00 | 46.6 | 14.0 | 88.6 |
| 157.50 | 25.5 | 12.6 | 63.4 |
| 180.00 | 29.6 | 12.9 | 68.3 |
| 202.50 | 30.7 | 13.5 | 71.4 |
| 225.00 | 32.3 | 12.3 | 69.3 |
| 247.50 | 35.1 | 18.4 | 90.3 |
| 270.00 | 42.1 | 14.5 | 85.6 |
| 292.50 | 28.2 | 15.7 | 75.4 |
| 315.00 | 21.3 | 15.0 | 66.4 |
| 337.50 | 21.4 | 12.1 | 57.6 |

LOCATION   3

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 55.1 | 16.9 | 105.8 |
| 22.50 | 51.8 | 11.4 | 86.1 |
| 45.00 | 51.3 | 15.4 | 97.6 |
| 67.50 | 29.3 | 15.6 | 76.1 |
| 90.00 | 20.8 | 8.8 | 47.1 |
| 112.50 | 18.8 | 9.2 | 46.5 |
| 135.00 | 24.9 | 10.7 | 56.9 |
| 157.50 | 27.8 | 14.5 | 71.4 |
| 180.00 | 51.5 | 17.2 | 103.1 |
| 202.50 | 50.3 | 13.0 | 89.5 |
| 225.00 | 52.3 | 12.5 | 89.8 |
| 247.50 | 60.5 | 16.0 | 108.5 |
| 270.00 | 61.4 | 16.0 | 109.3 |
| 292.50 | 43.8 | 17.8 | 97.3 |
| 315.00 | 21.8 | 15.5 | 68.4 |
| 337.50 | 32.5 | 18.4 | 87.8 |

LOCATION   4

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 49.1 | 25.3 | 125.0 |
| 22.50 | 19.7 | 12.8 | 58.1 |
| 45.00 | 42.9 | 21.9 | 108.7 |
| 67.50 | 58.2 | 21.9 | 123.9 |
| 90.00 | 60.9 | 16.6 | 110.8 |
| 112.50 | 71.7 | 16.4 | 120.9 |
| 135.00 | 40.7 | 17.5 | 93.1 |
| 157.50 | 37.4 | 17.1 | 89.6 |
| 180.00 | 61.7 | 17.9 | 115.4 |
| 202.50 | 46.8 | 13.3 | 86.6 |
| 225.00 | 37.7 | 12.0 | 73.7 |
| 247.50 | 40.5 | 13.5 | 81.0 |
| 270.00 | 41.9 | 14.2 | 84.4 |
| 292.50 | 34.0 | 15.6 | 80.7 |
| 315.00 | 32.9 | 14.4 | 76.2 |
| 337.50 | 38.2 | 15.2 | 83.9 |

TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES

PET PLAZA-EXISTING CONFIGURATION

LOCATION 5

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 53.5 | 18.1 | 107.8 |
| 22.50 | 60.9 | 14.8 | 105.4 |
| 45.00 | 65.9 | 16.0 | 113.7 |
| 67.50 | 59.4 | 18.9 | 116.2 |
| 90.00 | 53.6 | 14.7 | 97.7 |
| 112.50 | 54.7 | 12.9 | 93.3 |
| 135.00 | 13.1 | 8.2 | 37.8 |
| 157.50 | 10.5 | 5.9 | 28.3 |
| 180.00 | 21.4 | 10.6 | 53.2 |
| 202.50 | 29.5 | 13.8 | 71.0 |
| 225.00 | 29.8 | 11.0 | 62.7 |
| 247.50 | 25.0 | 10.8 | 57.4 |
| 270.00 | 24.1 | 10.8 | 56.5 |
| 292.50 | 34.2 | 12.9 | 72.9 |
| 315.00 | 44.9 | 10.1 | 75.3 |
| 337.50 | 46.7 | 14.5 | 90.1 |

LOCATION 6

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 14.2 | 8.3 | 39.0 |
| 22.50 | 14.6 | 8.3 | 39.3 |
| 45.00 | 14.2 | 9.0 | 41.3 |
| 67.50 | 18.6 | 9.8 | 48.1 |
| 90.00 | 13.1 | 6.7 | 33.1 |
| 112.50 | 32.1 | 13.3 | 72.0 |
| 135.00 | 57.6 | 16.3 | 106.7 |
| 157.50 | 45.5 | 15.7 | 92.5 |
| 180.00 | 65.5 | 12.6 | 103.4 |
| 202.50 | 50.7 | 17.6 | 103.4 |
| 225.00 | 32.6 | 16.8 | 83.0 |
| 247.50 | 28.7 | 13.8 | 70.0 |
| 270.00 | 32.9 | 12.4 | 70.0 |
| 292.50 | 58.8 | 19.6 | 117.6 |
| 315.00 | 60.7 | 20.2 | 121.4 |
| 337.50 | 35.7 | 20.6 | 97.6 |

LOCATION 7

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 14.5 | 9.2 | 42.2 |
| 22.50 | 17.7 | 10.5 | 49.4 |
| 45.00 | 20.0 | 11.7 | 55.1 |
| 67.50 | 24.5 | 14.1 | 67.0 |
| 90.00 | 55.8 | 21.8 | 121.1 |
| 112.50 | 65.5 | 12.8 | 103.8 |
| 135.00 | 56.8 | 13.5 | 97.4 |
| 157.50 | 25.5 | 12.3 | 62.4 |
| 180.00 | 23.3 | 11.5 | 57.9 |
| 202.50 | 26.6 | 16.4 | 75.8 |
| 225.00 | 43.0 | 14.1 | 85.2 |
| 247.50 | 69.4 | 14.4 | 112.7 |
| 270.00 | 55.8 | 11.1 | 89.0 |
| 292.50 | 60.5 | 16.7 | 110.7 |
| 315.00 | 50.0 | 19.5 | 108.3 |
| 337.50 | 35.2 | 18.7 | 91.2 |

LOCATION 8

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 60.2 | 18.6 | 115.9 |
| 22.50 | 67.5 | 13.3 | 107.3 |
| 45.00 | 78.3 | 12.8 | 116.7 |
| 67.50 | 80.4 | 14.8 | 124.9 |
| 90.00 | 71.9 | 13.7 | 112.9 |
| 112.50 | 79.7 | 13.2 | 119.4 |
| 135.00 | 70.7 | 12.9 | 109.4 |
| 157.50 | 25.7 | 10.1 | 56.0 |
| 180.00 | 38.0 | 18.8 | 94.4 |
| 202.50 | 42.6 | 13.7 | 83.6 |
| 225.00 | 34.2 | 10.5 | 65.6 |
| 247.50 | 38.0 | 11.7 | 73.1 |
| 270.00 | 39.2 | 13.8 | 80.7 |
| 292.50 | 21.3 | 8.7 | 47.4 |
| 315.00 | 14.9 | 8.9 | 41.6 |
| 337.50 | 16.5 | 9.5 | 45.0 |

TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES

PET PLAZA-EXISTING CONFIGURATION

### LOCATION 9

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 63.2 | 16.0 | 111.2 |
| 22.50 | 72.7 | 10.5 | 104.2 |
| 45.00 | 76.7 | 12.0 | 112.9 |
| 67.50 | 72.1 | 14.3 | 114.9 |
| 90.00 | 52.6 | 14.8 | 97.0 |
| 112.50 | 72.8 | 13.2 | 112.4 |
| 135.00 | 60.2 | 12.8 | 98.7 |
| 157.50 | 14.9 | 8.2 | 39.5 |
| 180.00 | 27.6 | 15.9 | 75.4 |
| 202.50 | 54.6 | 15.1 | 100.0 |
| 225.00 | 47.7 | 12.1 | 84.0 |
| 247.50 | 50.9 | 11.3 | 84.7 |
| 270.00 | 55.8 | 11.9 | 91.5 |
| 292.50 | 29.3 | 10.1 | 59.5 |
| 315.00 | 16.4 | 8.4 | 41.4 |
| 337.50 | 20.4 | 13.2 | 60.0 |

### LOCATION 10

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 39.8 | 9.8 | 69.2 |
| 22.50 | 48.5 | 8.8 | 75.0 |
| 45.00 | 77.0 | 12.4 | 114.2 |
| 67.50 | 74.3 | 11.8 | 109.6 |
| 90.00 | 75.2 | 14.0 | 117.1 |
| 112.50 | 73.0 | 12.6 | 110.8 |
| 135.00 | 51.4 | 10.5 | 83.1 |
| 157.50 | 17.4 | 12.1 | 53.7 |
| 180.00 | 29.1 | 15.4 | 75.4 |
| 202.50 | 58.9 | 15.2 | 104.5 |
| 225.00 | 66.6 | 12.4 | 103.9 |
| 247.50 | 79.4 | 10.3 | 110.3 |
| 270.00 | 77.7 | 13.0 | 116.8 |
| 292.50 | 57.9 | 11.9 | 93.6 |
| 315.00 | 55.5 | 10.8 | 88.0 |
| 337.50 | 22.5 | 11.5 | 56.9 |

### LOCATION 11

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 43.9 | 11.2 | 77.7 |
| 22.50 | 47.1 | 10.7 | 79.2 |
| 45.00 | 81.3 | 12.6 | 119.3 |
| 67.50 | 80.2 | 12.9 | 119.0 |
| 90.00 | 75.7 | 17.5 | 128.2 |
| 112.50 | 61.2 | 20.2 | 121.8 |
| 135.00 | 31.8 | 12.0 | 67.8 |
| 157.50 | 12.9 | 9.4 | 41.1 |
| 180.00 | 20.2 | 11.0 | 53.3 |
| 202.50 | 38.6 | 15.0 | 83.6 |
| 225.00 | 61.8 | 14.9 | 106.6 |
| 247.50 | 77.4 | 11.7 | 112.5 |
| 270.00 | 78.9 | 11.4 | 113.0 |
| 292.50 | 61.4 | 13.0 | 100.4 |
| 315.00 | 58.2 | 11.8 | 93.6 |
| 337.50 | 14.4 | 8.5 | 40.0 |

### LOCATION 12

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 47.0 | 9.5 | 75.6 |
| 22.50 | 51.6 | 8.6 | 77.5 |
| 45.00 | 88.1 | 13.3 | 128.2 |
| 67.50 | 84.3 | 13.7 | 125.5 |
| 90.00 | 76.3 | 15.6 | 123.1 |
| 112.50 | 67.3 | 14.3 | 110.3 |
| 135.00 | 46.7 | 11.8 | 82.1 |
| 157.50 | 23.4 | 14.5 | 67.0 |
| 180.00 | 26.6 | 15.5 | 73.1 |
| 202.50 | 59.7 | 14.1 | 102.0 |
| 225.00 | 72.0 | 12.2 | 108.7 |
| 247.50 | 83.7 | 13.2 | 123.4 |
| 270.00 | 84.6 | 15.6 | 131.5 |
| 292.50 | 71.4 | 13.8 | 112.8 |
| 315.00 | 58.8 | 13.8 | 100.2 |
| 337.50 | 19.4 | 9.6 | 48.3 |

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# TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
## PET PLAZA-EXISTING CONFIGURATION

LOCATION 13

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 32.2 | 11.6 | 66.9 |
| 22.50 | 47.7 | 10.5 | 79.2 |
| 45.00 | 85.2 | 12.7 | 123.2 |
| 67.50 | 90.4 | 12.7 | 128.4 |
| 90.00 | 81.1 | 15.0 | 126.2 |
| 112.50 | 72.8 | 19.6 | 131.5 |
| 135.00 | 23.4 | 13.9 | 65.3 |
| 157.50 | 9.2 | 4.3 | 22.2 |
| 180.00 | 17.6 | 8.4 | 42.9 |
| 202.50 | 23.2 | 11.3 | 56.9 |
| 225.00 | 58.6 | 21.6 | 123.5 |
| 247.50 | 81.3 | 18.5 | 136.7 |
| 270.00 | 83.7 | 16.9 | 134.5 |
| 292.50 | 72.1 | 15.3 | 118.2 |
| 315.00 | 68.7 | 15.7 | 115.7 |
| 337.50 | 15.3 | 8.2 | 40.0 |

LOCATION 14

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 51.4 | 9.9 | 81.1 |
| 22.50 | 44.6 | 8.5 | 70.1 |
| 45.00 | 88.1 | 12.3 | 125.1 |
| 67.50 | 92.0 | 14.3 | 134.9 |
| 90.00 | 80.0 | 18.9 | 136.6 |
| 112.50 | 64.5 | 20.2 | 125.0 |
| 135.00 | 35.6 | 11.9 | 71.4 |
| 157.50 | 6.7 | 6.7 | 26.9 |
| 180.00 | 18.5 | 9.9 | 48.1 |
| 202.50 | 23.5 | 11.2 | 57.3 |
| 225.00 | 59.0 | 16.9 | 109.7 |
| 247.50 | 79.4 | 15.7 | 126.5 |
| 270.00 | 79.1 | 19.4 | 137.4 |
| 292.50 | 71.3 | 15.8 | 118.6 |
| 315.00 | 70.0 | 15.4 | 116.1 |
| 337.50 | 17.1 | 10.8 | 49.6 |

LOCATION 15

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 44.4 | 7.1 | 65.7 |
| 22.50 | 37.9 | 8.2 | 62.5 |
| 45.00 | 76.0 | 10.4 | 107.3 |
| 67.50 | 68.1 | 15.1 | 113.6 |
| 90.00 | 53.2 | 25.0 | 128.0 |
| 112.50 | 25.3 | 15.1 | 70.5 |
| 135.00 | 9.5 | 4.1 | 22.0 |
| 157.50 | 24.9 | 13.8 | 66.2 |
| 180.00 | 23.7 | 12.4 | 61.0 |
| 202.50 | 60.4 | 13.9 | 102.0 |
| 225.00 | 71.0 | 11.5 | 105.4 |
| 247.50 | 73.3 | 12.5 | 110.9 |
| 270.00 | 79.0 | 14.3 | 122.1 |
| 292.50 | 63.8 | 15.8 | 111.2 |
| 315.00 | 56.5 | 14.7 | 109.5 |
| 337.50 | 11.0 | 6.3 | 29.8 |

LOCATION 16

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 32.4 | 10.3 | 63.4 |
| 22.50 | 40.1 | 9.3 | 68.1 |
| 45.00 | 76.4 | 10.4 | 107.6 |
| 67.50 | 73.2 | 9.1 | 100.3 |
| 90.00 | 73.0 | 9.8 | 102.3 |
| 112.50 | 70.3 | 10.3 | 101.5 |
| 135.00 | 40.9 | 15.1 | 86.1 |
| 157.50 | 10.9 | 9.3 | 38.7 |
| 180.00 | 18.2 | 10.3 | 49.1 |
| 202.50 | 27.4 | 10.5 | 58.8 |
| 225.00 | 45.5 | 18.1 | 99.7 |
| 247.50 | 72.4 | 17.7 | 125.6 |
| 270.00 | 83.8 | 15.0 | 128.8 |
| 292.50 | 65.6 | 16.0 | 113.6 |
| 315.00 | 65.6 | 14.4 | 108.9 |
| 337.50 | 12.5 | 6.7 | 32.5 |

## TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
## PET PLAZA-EXISTING CONFIGURATION

LOCATION 17

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 40.0 | 9.3 | 67.8 |
| 22.50 | 43.2 | 7.5 | 65.6 |
| 45.00 | 48.5 | 7.4 | 70.8 |
| 67.50 | 51.9 | 7.9 | 75.6 |
| 90.00 | 52.4 | 9.8 | 81.7 |
| 112.50 | 59.6 | 10.0 | 89.6 |
| 135.00 | 42.0 | 8.1 | 66.2 |
| 157.50 | 12.6 | 8.7 | 38.8 |
| 180.00 | 24.5 | 17.7 | 77.7 |
| 202.50 | 48.5 | 13.5 | 89.0 |
| 225.00 | 60.4 | 13.1 | 99.7 |
| 247.50 | 69.5 | 13.3 | 109.4 |
| 270.00 | 67.6 | 13.8 | 109.1 |
| 292.50 | 59.1 | 13.6 | 99.9 |
| 315.00 | 64.4 | 13.9 | 106.1 |
| 337.50 | 27.3 | 12.8 | 65.6 |

LOCATION 18

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 15.5 | 9.8 | 44.8 |
| 22.50 | 16.0 | 9.9 | 45.7 |
| 45.00 | 24.8 | 11.8 | 60.3 |
| 67.50 | 36.8 | 13.5 | 77.1 |
| 90.00 | 32.8 | 12.9 | 71.6 |
| 112.50 | 49.2 | 15.2 | 94.7 |
| 135.00 | 45.7 | 17.6 | 98.3 |
| 157.50 | 23.7 | 14.0 | 65.8 |
| 180.00 | 20.4 | 11.4 | 54.6 |
| 202.50 | 15.9 | 8.1 | 40.3 |
| 225.00 | 14.5 | 8.1 | 38.6 |
| 247.50 | 21.4 | 9.8 | 50.6 |
| 279.00 | 23.2 | 10.2 | 53.9 |
| 292.50 | 69.5 | 22.2 | 136.2 |
| 315.00 | 52.8 | 13.1 | 92.0 |
| 337.50 | 43.9 | 17.0 | 94.9 |

LOCATION 19

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 40.3 | 11.9 | 75.9 |
| 22.50 | 32.2 | 11.7 | 67.2 |
| 45.00 | 21.6 | 11.5 | 56.3 |
| 67.50 | 24.5 | 14.4 | 67.7 |
| 90.00 | 25.8 | 12.6 | 63.6 |
| 112.50 | 39.3 | 13.0 | 78.2 |
| 135.00 | 36.8 | 10.9 | 69.5 |
| 157.50 | 26.1 | 15.6 | 72.9 |
| 180.00 | 13.2 | 7.8 | 36.7 |
| 202.50 | 10.8 | 6.0 | 28.9 |
| 225.00 | 11.1 | 6.4 | 30.4 |
| 247.50 | 28.7 | 13.1 | 67.9 |
| 270.00 | 34.0 | 11.6 | 68.8 |
| 292.50 | 23.3 | 9.3 | 51.3 |
| 315.00 | 18.6 | 9.3 | 46.6 |
| 337.50 | 28.3 | 13.4 | 68.4 |

LOCATION 20

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 19.1 | 11.0 | 52.1 |
| 22.50 | 17.7 | 11.9 | 53.5 |
| 45.00 | 10.6 | 7.6 | 33.3 |
| 67.50 | 16.2 | 9.6 | 44.9 |
| 90.00 | 19.0 | 9.3 | 46.9 |
| 112.50 | 25.0 | 10.5 | 56.5 |
| 135.00 | 38.0 | 11.4 | 72.3 |
| 157.50 | 37.1 | 17.4 | 89.3 |
| 180.00 | 21.3 | 12.4 | 58.6 |
| 202.50 | 23.4 | 13.2 | 63.1 |
| 225.00 | 35.6 | 18.9 | 92.4 |
| 247.50 | 46.0 | 20.8 | 108.3 |
| 270.00 | 16.6 | 11.5 | 51.1 |
| 292.50 | 34.2 | 17.2 | 85.9 |
| 315.00 | 40.8 | 18.7 | 96.9 |
| 337.50 | 32.7 | 17.3 | 84.5 |

# TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
## PET PLAZA-EXISTING CONFIGURATION

LOCATION 21

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 32.7 | 19.6 | 91.5 |
| 22.50 | 49.5 | 14.2 | 92.1 |
| 45.00 | 36.1 | 19.5 | 94.5 |
| 67.50 | 30.9 | 17.9 | 84.5 |
| 90.00 | 21.7 | 10.4 | 52.9 |
| 112.50 | 28.6 | 9.9 | 58.4 |
| 135.00 | 33.5 | 11.2 | 67.2 |
| 157.50 | 27.0 | 10.3 | 58.0 |
| 180.00 | 23.1 | 12.4 | 60.3 |
| 202.50 | 21.0 | 11.9 | 56.7 |
| 225.00 | 21.8 | 12.6 | 59.6 |
| 247.50 | 44.0 | 23.9 | 115.6 |
| 270.00 | 30.9 | 16.5 | 80.4 |
| 292.50 | 52.4 | 16.0 | 100.4 |
| 315.00 | 55.6 | 16.2 | 104.0 |
| 337.50 | 19.2 | 15.1 | 64.4 |

LOCATION 22

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 65.3 | 12.4 | 102.4 |
| 22.50 | 61.8 | 11.1 | 94.9 |
| 45.00 | 55.4 | 12.0 | 91.3 |
| 67.50 | 52.6 | 14.5 | 96.3 |
| 90.00 | 26.3 | 12.3 | 63.4 |
| 112.50 | 18.5 | 11.3 | 52.4 |
| 135.00 | 26.9 | 13.6 | 67.6 |
| 157.50 | 37.7 | 16.2 | 86.3 |
| 180.00 | 62.3 | 14.1 | 104.8 |
| 202.50 | 74.9 | 15.4 | 121.2 |
| 225.00 | 62.8 | 23.4 | 132.9 |
| 247.50 | 27.0 | 14.0 | 69.0 |
| 270.00 | 15.8 | 11.9 | 51.4 |
| 292.50 | 24.0 | 14.4 | 67.2 |
| 315.00 | 36.1 | 23.4 | 106.4 |
| 337.50 | 25.5 | 11.2 | 59.0 |

TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES

PET PLAZA-EXISTING CONFIGURATION

* * GREATEST VALUES * *

| | UMEAN/UINF (PERCENT) | | | | | URMS/UINF (PERCENT) | | | | | UMEAN+3*RMS/UINF (PERCENT) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOC | AZ | MEAN | RMS | M+3RMS | | LOC | AZ | MEAN | RMS | M+3RMS | LOC | AZ | MEAN | RMS | M+3RMS |
| 14 | 67.5 | 92.0 | 14.3 | 134.9 | | 2 | 67.5 | 53.9 | 25.7 | 131.0 | 14 | 270.0 | 79.1 | 19.4 | 137.4 |
| 13 | 67.5 | 90.4 | 12.7 | 128.4 | | 4 | 0.0 | 49.1 | 25.3 | 125.0 | 13 | 247.5 | 81.3 | 18.5 | 136.7 |
| 12 | 45.0 | 88.1 | 13.3 | 128.2 | | 15 | 90.0 | 53.2 | 25.0 | 128.0 | 14 | 90.0 | 80.0 | 18.9 | 136.6 |
| 14 | 45.0 | 88.1 | 12.3 | 125.1 | | 21 | 247.5 | 44.0 | 23.9 | 115.6 | 18 | 292.5 | 69.5 | 22.2 | 136.2 |
| 13 | 45.0 | 85.2 | 12.7 | 123.2 | | 22 | 315.0 | 36.1 | 23.4 | 106.4 | 14 | 67.5 | 92.0 | 14.3 | 134.9 |
| 12 | 270.0 | 84.6 | 15.6 | 131.5 | | 22 | 225.0 | 62.8 | 23.4 | 132.9 | 13 | 270.0 | 83.7 | 16.9 | 134.5 |
| 12 | 67.5 | 84.3 | 13.7 | 125.5 | | 18 | 292.5 | 69.5 | 22.2 | 136.2 | 22 | 225.0 | 62.8 | 23.4 | 132.9 |
| 16 | 270.0 | 83.8 | 15.0 | 128.8 | | 4 | 45.0 | 42.9 | 21.9 | 108.7 | 13 | 112.5 | 72.8 | 19.6 | 131.5 |
| 12 | 247.5 | 83.7 | 13.2 | 123.4 | | 4 | 67.5 | 58.2 | 21.9 | 123.9 | 12 | 270.0 | 84.6 | 15.6 | 131.5 |
| 13 | 270.0 | 83.7 | 16.9 | 134.5 | | 7 | 90.0 | 55.8 | 21.8 | 121.1 | 2 | 67.5 | 53.9 | 25.7 | 131.0 |

## TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
### PET PLAZA-GREENHOUSE ONLY

LOCATION   3

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 51.3 | 16.5 | 100.8 |
| 22.50 | 49.7 | 11.9 | 85.4 |
| 45.00 | 59.9 | 14.1 | 102.2 |
| 67.50 | 42.2 | 20.6 | 103.9 |
| 90.00 | 22.0 | 9.6 | 50.9 |
| 112.50 | 17.2 | 8.4 | 42.4 |
| 135.00 | 28.2 | 14.5 | 71.9 |
| 157.50 | 26.7 | 16.9 | 77.5 |
| 180.00 | 53.7 | 15.1 | 99.0 |
| 202.50 | 57.8 | 12.1 | 94.0 |
| 225.00 | 53.4 | 14.0 | 95.3 |
| 247.50 | 57.9 | 13.4 | 98.2 |
| 270.00 | 61.1 | 17.8 | 114.3 |
| 292.50 | 55.5 | 18.3 | 110.3 |
| 315.00 | 52.1 | 18.2 | 106.7 |
| 337.50 | 22.0 | 10.5 | 53.4 |

LOCATION   4

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 60.7 | 23.9 | 132.5 |
| 22.50 | 30.7 | 13.6 | 71.5 |
| 45.00 | 14.5 | 7.8 | 37.7 |
| 67.50 | 23.4 | 11.2 | 57.0 |
| 90.00 | 23.3 | 10.3 | 54.2 |
| 112.50 | 18.3 | 7.5 | 40.8 |
| 135.00 | 27.0 | 12.5 | 64.4 |
| 157.50 | 39.6 | 16.8 | 90.1 |
| 180.00 | 64.8 | 22.0 | 130.8 |
| 202.50 | 47.7 | 16.1 | 96.1 |
| 225.00 | 38.3 | 11.4 | 72.4 |
| 247.50 | 37.9 | 12.3 | 74.9 |
| 270.00 | 37.4 | 15.8 | 84.9 |
| 292.50 | 34.0 | 15.5 | 80.3 |
| 315.00 | 31.5 | 14.2 | 74.0 |
| 337.50 | 15.7 | 8.6 | 41.4 |

LOCATION   5

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 27.5 | 15.6 | 74.4 |
| 22.50 | 11.5 | 5.3 | 27.4 |
| 45.00 | 13.8 | 6.7 | 34.0 |
| 67.50 | 21.4 | 10.6 | 53.1 |
| 90.00 | 16.5 | 7.6 | 39.4 |
| 112.50 | 14.8 | 5.8 | 32.1 |
| 135.00 | 19.5 | 10.0 | 49.6 |
| 157.50 | 14.8 | 7.1 | 35.9 |
| 180.00 | 19.8 | 9.7 | 48.8 |
| 202.50 | 26.0 | 13.9 | 67.7 |
| 225.00 | 24.1 | 9.2 | 51.7 |
| 247.50 | 20.7 | 10.2 | 51.3 |
| 270.00 | 22.9 | 12.5 | 60.2 |
| 292.50 | 55.2 | 16.8 | 105.6 |
| 315.00 | 44.6 | 12.4 | 81.9 |
| 337.50 | 21.7 | 9.6 | 50.6 |

LOCATION   8

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 25.0 | 14.9 | 69.7 |
| 22.50 | 14.4 | 7.4 | 36.6 |
| 45.00 | 9.5 | 4.9 | 24.1 |
| 67.50 | 13.5 | 7.4 | 35.5 |
| 90.00 | 16.3 | 7.5 | 38.7 |
| 112.50 | 14.5 | 6.1 | 32.7 |
| 135.00 | 20.4 | 11.8 | 55.9 |
| 157.50 | 29.1 | 13.4 | 69.4 |
| 180.00 | 39.7 | 18.5 | 95.2 |
| 202.50 | 41.5 | 16.4 | 90.7 |
| 225.00 | 21.1 | 11.6 | 55.9 |
| 247.50 | 20.1 | 9.3 | 48.1 |
| 270.00 | 21.1 | 8.4 | 46.3 |
| 292.50 | 18.3 | 9.5 | 46.7 |
| 315.00 | 23.4 | 12.0 | 59.5 |
| 337.50 | 9.6 | 6.5 | 29.0 |

## TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES

### PET PLAZA-GREENHOUSE ONLY

LOCATION  9

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 14.6 | 8.4 | 39.9 |
| 22.50 | 7.9 | 3.4 | 18.2 |
| 45.00 | 7.8 | 3.6 | 18.6 |
| 67.50 | 10.7 | 4.3 | 23.5 |
| 90.00 | 11.4 | 5.0 | 26.5 |
| 112.50 | 11.7 | 5.6 | 28.4 |
| 135.00 | 14.8 | 8.4 | 39.9 |
| 157.50 | 17.6 | 10.4 | 48.9 |
| 180.00 | 21.2 | 13.3 | 61.1 |
| 202.50 | 35.2 | 17.8 | 88.5 |
| 225.00 | 29.1 | 15.2 | 74.6 |
| 247.50 | 19.1 | 10.4 | 50.2 |
| 270.00 | 18.7 | 6.9 | 39.4 |
| 292.50 | 17.1 | 9.0 | 44.1 |
| 315.00 | 22.0 | 11.2 | 55.6 |
| 337.50 | 8.8 | 5.9 | 26.6 |

LOCATION  10

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 14.8 | 7.7 | 37.9 |
| 22.50 | 10.2 | 4.1 | 22.5 |
| 45.00 | 7.4 | 3.4 | 17.5 |
| 67.50 | 6.0 | 3.0 | 15.1 |
| 90.00 | 6.4 | 3.2 | 16.0 |
| 112.50 | 5.5 | 2.7 | 13.6 |
| 135.00 | 6.8 | 4.2 | 19.5 |
| 157.50 | 10.6 | 4.4 | 23.9 |
| 180.00 | 26.5 | 14.0 | 68.5 |
| 202.50 | 28.0 | 11.3 | 62.0 |
| 225.00 | 29.6 | 9.7 | 58.7 |
| 247.50 | 31.9 | 8.9 | 58.7 |
| 270.00 | 33.0 | 10.8 | 65.5 |
| 292.50 | 21.2 | 9.3 | 49.0 |
| 315.00 | 12.5 | 6.3 | 31.4 |
| 337.50 | 8.9 | 3.6 | 19.8 |

LOCATION  11

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 12.1 | 6.0 | 30.0 |
| 22.50 | 9.9 | 4.0 | 22.0 |
| 45.00 | 7.1 | 2.8 | 15.6 |
| 67.50 | 8.8 | 4.4 | 21.9 |
| 90.00 | 5.4 | 2.8 | 13.7 |
| 112.50 | 7.1 | 4.1 | 19.3 |
| 135.00 | 5.0 | 3.8 | 16.5 |
| 157.50 | 15.3 | 6.2 | 33.9 |
| 180.00 | 22.3 | 10.9 | 55.1 |
| 202.50 | 14.6 | 7.2 | 36.3 |
| 225.00 | 22.6 | 8.3 | 47.4 |
| 247.50 | 27.4 | 8.0 | 51.3 |
| 270.00 | 34.1 | 7.9 | 57.9 |
| 292.50 | 24.1 | 10.5 | 55.6 |
| 315.00 | 29.9 | 10.4 | 61.1 |
| 337.50 | 9.8 | 4.2 | 22.5 |

LOCATION  12

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 13.1 | 5.3 | 28.9 |
| 22.50 | 11.5 | 4.0 | 23.4 |
| 45.00 | 8.6 | 3.0 | 17.7 |
| 67.50 | 7.7 | 2.9 | 16.4 |
| 90.00 | 8.3 | 2.7 | 16.5 |
| 112.50 | 5.1 | 1.8 | 10.6 |
| 135.00 | 3.7 | 1.6 | 8.4 |
| 157.50 | 8.7 | 3.0 | 17.8 |
| 180.00 | 19.2 | 9.4 | 47.5 |
| 202.50 | 26.3 | 9.8 | 55.6 |
| 225.00 | 26.3 | 8.2 | 50.7 |
| 247.50 | 29.7 | 9.9 | 59.4 |
| 270.00 | 32.9 | 10.6 | 64.8 |
| 292.50 | 20.2 | 7.9 | 43.9 |
| 315.00 | 15.5 | 7.0 | 36.4 |
| 337.50 | 9.5 | 3.6 | 20.3 |

## TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
## PET PLAZA-GREENHOUSE ONLY

LOCATION 13

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 11.4 | 5.0 | 26.6 |
| 22.50 | 8.4 | 3.3 | 18.4 |
| 45.00 | 5.3 | 2.1 | 11.5 |
| 67.50 | 5.2 | 2.3 | 12.2 |
| 90.00 | 4.1 | 2.4 | 11.3 |
| 112.50 | 4.4 | 2.3 | 11.3 |
| 135.00 | 3.7 | 2.0 | 9.6 |
| 157.50 | 10.0 | 3.7 | 21.1 |
| 180.00 | 18.0 | 8.9 | 44.8 |
| 202.50 | 11.5 | 4.3 | 24.4 |
| 225.00 | 14.7 | 6.6 | 34.4 |
| 247.50 | 24.2 | 10.7 | 56.2 |
| 270.00 | 35.1 | 9.6 | 64.0 |
| 292.50 | 18.6 | 8.8 | 45.0 |
| 315.00 | 26.0 | 11.2 | 59.6 |
| 337.50 | 9.0 | 3.7 | 20.1 |

LOCATION 14

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 8.1 | 3.5 | 18.6 |
| 22.50 | 5.4 | 2.9 | 13.8 |
| 45.00 | 4.0 | 1.6 | 8.9 |
| 67.50 | 4.8 | 2.1 | 11.0 |
| 90.00 | 3.9 | 2.1 | 10.0 |
| 112.50 | 3.7 | 2.0 | 9.8 |
| 135.00 | 3.8 | 1.9 | 9.6 |
| 157.50 | 8.4 | 3.1 | 17.5 |
| 180.00 | 13.5 | 5.1 | 28.9 |
| 202.50 | 11.4 | 3.5 | 22.0 |
| 225.00 | 11.1 | 5.8 | 28.4 |
| 247.50 | 20.4 | 10.7 | 52.5 |
| 270.00 | 32.5 | 9.9 | 62.2 |
| 292.50 | 17.8 | 6.7 | 37.9 |
| 315.00 | 33.3 | 12.1 | 69.6 |
| 337.50 | 8.8 | 4.5 | 22.3 |

LOCATION 17

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 8.2 | 3.2 | 17.7 |
| 22.50 | 10.3 | 3.7 | 21.5 |
| 45.00 | 8.3 | 3.7 | 19.5 |
| 67.50 | 8.5 | 3.9 | 20.3 |
| 90.00 | 5.1 | 2.3 | 12.0 |
| 112.50 | 5.2 | 2.0 | 11.2 |
| 135.00 | 4.7 | 1.9 | 10.3 |
| 157.50 | 2.9 | 1.4 | 7.1 |
| 180.00 | 7.9 | 3.4 | 18.0 |
| 202.50 | 8.2 | 2.5 | 15.8 |
| 225.00 | 7.8 | 2.1 | 14.2 |
| 247.50 | 8.1 | 2.9 | 16.9 |
| 270.00 | 10.4 | 4.5 | 23.9 |
| 292.50 | 8.9 | 4.2 | 21.5 |
| 315.00 | 11.4 | 5.8 | 28.7 |
| 337.50 | 5.4 | 1.4 | 9.6 |

LOCATION 18

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 21.4 | 10.8 | 53.8 |
| 22.50 | 17.8 | 7.9 | 41.3 |
| 45.00 | 32.3 | 14.0 | 74.3 |
| 67.50 | 46.0 | 17.9 | 99.5 |
| 90.00 | 53.9 | 17.9 | 107.5 |
| 112.50 | 57.1 | 16.5 | 106.6 |
| 135.00 | 44.8 | 14.9 | 89.4 |
| 157.50 | 9.8 | 5.1 | 25.1 |
| 180.00 | 12.7 | 8.3 | 37.6 |
| 202.50 | 13.1 | 7.3 | 35.1 |
| 225.00 | 14.4 | 8.6 | 40.2 |
| 247.50 | 12.6 | 8.6 | 38.4 |
| 270.00 | 10.1 | 5.6 | 26.8 |
| 292.50 | 24.6 | 14.0 | 66.7 |
| 315.00 | 32.9 | 15.7 | 79.9 |
| 337.50 | 18.5 | 11.2 | 52.1 |

## TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
## PET PLAZA-GREENHOUSE ONLY

LOCATION 20

| WIND<br>AZIMUTH | UMEAN/UINF<br>(PERCENT) | URMS/UINF<br>(PERCENT) | UMEAN+3*URMS/UINF<br>(PERCENT) |
|---|---|---|---|
| 0.00 | 23.6 | 10.3 | 54.6 |
| 22.50 | 24.8 | 10.2 | 55.3 |
| 45.00 | 16.8 | 8.2 | 41.4 |
| 67.50 | 19.2 | 9.4 | 47.4 |
| 90.00 | 22.5 | 10.0 | 52.5 |
| 112.50 | 28.9 | 11.4 | 63.2 |
| 135.00 | 27.8 | 10.0 | 57.8 |
| 157.50 | 15.2 | 8.1 | 39.6 |
| 180.00 | 17.6 | 11.8 | 53.1 |
| 202.50 | 15.3 | 9.1 | 42.6 |
| 225.00 | 13.5 | 8.2 | 38.2 |
| 247.50 | 11.0 | 7.4 | 33.3 |
| 270.00 | 10.8 | 8.0 | 34.8 |
| 292.50 | 9.1 | 6.4 | 28.1 |
| 315.00 | 20.8 | 12.3 | 57.8 |
| 337.50 | 9.1 | 5.7 | 26.2 |

## TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
### PET PLAZA-GREENHOUSE ONLY

* * GREATEST VALUES * *

| UMEAN/UINF (PERCENT) | | | | | URMS/UINF (PERCENT) | | | | | UMEAN+3*RMS/UINF (PERCENT) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOC | AZ | MEAN | RMS | M+3RMS | LOC | AZ | MEAN | RMS | M+3RMS | LOC | AZ | MEAN | RMS | M+3RMS |
| 4 | 180.0 | 64.8 | 22.0 | 130.8 | 4 | 0.0 | 60.7 | 23.9 | 132.5 | 4 | 0.0 | 60.7 | 23.9 | 132.5 |
| 3 | 270.0 | 61.1 | 17.8 | 114.3 | 4 | 180.0 | 64.8 | 22.0 | 130.8 | 4 | 180.0 | 64.8 | 22.0 | 130.8 |
| 4 | 0.0 | 60.7 | 23.9 | 132.5 | 3 | 67.5 | 42.2 | 20.6 | 103.9 | 3 | 270.0 | 61.1 | 17.8 | 114.3 |
| 3 | 45.0 | 59.9 | 14.1 | 102.2 | 8 | 180.0 | 39.7 | 18.5 | 95.2 | 3 | 292.5 | 55.5 | 18.3 | 110.3 |
| 3 | 247.5 | 57.9 | 13.4 | 98.2 | 3 | 292.5 | 55.5 | 18.3 | 110.3 | 18 | 90.0 | 53.9 | 17.9 | 107.5 |
| 3 | 202.5 | 57.8 | 12.1 | 94.0 | 3 | 315.0 | 52.1 | 18.2 | 106.7 | 3 | 315.0 | 52.1 | 18.2 | 106.7 |
| 18 | 112.5 | 57.1 | 16.5 | 106.6 | 18 | 90.0 | 53.9 | 17.9 | 107.5 | 18 | 112.5 | 57.1 | 16.5 | 106.6 |
| 3 | 292.5 | 55.5 | 18.3 | 110.3 | 18 | 67.5 | 46.0 | 17.9 | 99.5 | 5 | 292.5 | 55.2 | 16.8 | 105.6 |
| 5 | 292.5 | 55.2 | 16.8 | 105.6 | 9 | 202.5 | 35.2 | 17.8 | 88.5 | 3 | 67.5 | 42.2 | 20.6 | 103.9 |
| 18 | 90.0 | 53.9 | 17.9 | 107.5 | 3 | 270.0 | 61.1 | 17.8 | 114.3 | 3 | 45.0 | 59.9 | 14.1 | 102.2 |

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## TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
### PET PLAZA-GREENHOUSE AND NORTH WALL

LOCATION  3

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 50.2 | 14.8 | 94.7 |
| 22.50 | 51.8 | 12.1 | 88.2 |
| 45.00 | 62.1 | 14.4 | 105.3 |
| 67.50 | 41.2 | 19.1 | 98.6 |
| 90.00 | 20.7 | 9.2 | 48.4 |
| 112.50 | 18.7 | 7.9 | 42.5 |
| 135.00 | 29.0 | 11.5 | 63.5 |
| 157.50 | 27.6 | 13.8 | 69.0 |
| 180.00 | 52.6 | 14.7 | 96.8 |
| 202.50 | 61.1 | 12.7 | 99.2 |
| 225.00 | 55.9 | 12.9 | 94.5 |
| 247.50 | 59.7 | 14.5 | 103.2 |
| 270.00 | 60.8 | 16.5 | 110.3 |
| 292.50 | 56.2 | 20.3 | 117.0 |
| 315.00 | 55.6 | 17.0 | 106.6 |
| 337.50 | 26.5 | 12.7 | 64.5 |

LOCATION  4

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 62.2 | 25.4 | 138.4 |
| 22.50 | 37.6 | 15.7 | 84.6 |
| 45.00 | 15.3 | 7.6 | 38.0 |
| 67.50 | 24.5 | 11.1 | 57.8 |
| 90.00 | 23.1 | 9.0 | 50.0 |
| 112.50 | 17.2 | 6.7 | 37.1 |
| 135.00 | 19.6 | 9.5 | 48.0 |
| 157.50 | 40.1 | 14.1 | 82.5 |
| 180.00 | 62.7 | 19.4 | 121.0 |
| 202.50 | 47.4 | 14.8 | 91.8 |
| 225.00 | 38.3 | 11.2 | 71.9 |
| 247.50 | 35.9 | 11.4 | 70.0 |
| 270.00 | 37.9 | 16.2 | 86.6 |
| 292.50 | 32.4 | 14.9 | 77.1 |
| 315.00 | 32.7 | 13.0 | 71.7 |
| 337.50 | 18.3 | 8.5 | 43.9 |

LOCATION  5

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 26.9 | 15.5 | 75.5 |
| 22.50 | 15.4 | 7.2 | 37.0 |
| 45.00 | 15.4 | 7.7 | 38.4 |
| 67.50 | 20.2 | 10.3 | 51.2 |
| 90.00 | 17.1 | 8.0 | 41.2 |
| 112.50 | 16.9 | 6.2 | 35.6 |
| 135.00 | 19.7 | 9.9 | 49.5 |
| 157.50 | 17.0 | 7.5 | 39.5 |
| 180.00 | 20.9 | 9.9 | 50.6 |
| 202.50 | 25.6 | 12.8 | 64.1 |
| 225.00 | 26.4 | 10.4 | 57.6 |
| 247.50 | 22.5 | 10.5 | 54.0 |
| 270.00 | 30.6 | 14.0 | 72.6 |
| 292.50 | 45.8 | 14.2 | 88.5 |
| 315.00 | 42.9 | 12.8 | 81.4 |
| 337.50 | 21.1 | 8.6 | 46.9 |

LOCATION  6

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 27.1 | 15.7 | 74.1 |
| 22.50 | 19.9 | 9.2 | 47.4 |
| 45.00 | 11.3 | 5.4 | 27.3 |
| 67.50 | 15.2 | 7.8 | 38.7 |
| 90.00 | 18.6 | 6.7 | 38.8 |
| 112.50 | 14.7 | 5.7 | 31.8 |
| 135.00 | 24.3 | 11.7 | 59.3 |
| 157.50 | 28.5 | 10.9 | 61.2 |
| 180.00 | 37.0 | 16.6 | 86.9 |
| 202.50 | 37.5 | 17.2 | 89.1 |
| 225.00 | 26.6 | 13.2 | 66.1 |
| 247.50 | 23.6 | 8.8 | 50.0 |
| 270.00 | 20.3 | 7.5 | 42.8 |
| 292.50 | 19.6 | 9.3 | 47.6 |
| 315.00 | 26.6 | 12.3 | 63.4 |
| 337.50 | 12.3 | 6.5 | 31.8 |

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# TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
## PET PLAZA-GREENHOUSE AND NORTH WALL

LOCATION 9

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 16.9 | 9.3 | 44.7 |
| 22.50 | 8.7 | 3.4 | 18.8 |
| 45.00 | 9.2 | 4.0 | 21.2 |
| 67.50 | 11.9 | 5.3 | 27.8 |
| 90.00 | 13.5 | 5.3 | 29.5 |
| 112.50 | 14.0 | 5.8 | 31.4 |
| 135.00 | 16.8 | 9.9 | 46.5 |
| 157.50 | 24.1 | 11.2 | 57.9 |
| 180.00 | 18.7 | 10.7 | 50.9 |
| 202.50 | 29.6 | 16.1 | 77.8 |
| 225.00 | 26.5 | 15.3 | 72.6 |
| 247.50 | 16.2 | 8.0 | 40.2 |
| 270.00 | 15.1 | 6.6 | 35.0 |
| 292.50 | 19.6 | 9.7 | 48.6 |
| 315.00 | 27.0 | 10.6 | 58.7 |
| 337.50 | 12.8 | 6.8 | 33.2 |

LOCATION 10

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 12.9 | 6.0 | 30.8 |
| 22.50 | 10.0 | 2.5 | 17.5 |
| 45.00 | 7.6 | 2.0 | 13.6 |
| 67.50 | 9.3 | 3.6 | 20.1 |
| 90.00 | 9.1 | 3.0 | 18.1 |
| 112.50 | 8.5 | 2.6 | 16.2 |
| 135.00 | 9.2 | 4.1 | 21.6 |
| 157.50 | 12.7 | 7.0 | 33.8 |
| 180.00 | 24.7 | 12.1 | 61.0 |
| 202.50 | 22.1 | 9.8 | 51.4 |
| 225.00 | 15.3 | 6.5 | 34.8 |
| 247.50 | 14.0 | 6.0 | 32.1 |
| 270.00 | 13.3 | 6.1 | 31.6 |
| 292.50 | 12.9 | 6.3 | 31.9 |
| 315.00 | 9.3 | 3.6 | 20.1 |
| 337.50 | 6.9 | 2.5 | 14.3 |

LOCATION 11

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 13.3 | 7.8 | 36.6 |
| 22.50 | 9.0 | 2.0 | 15.1 |
| 45.00 | 9.8 | 2.9 | 18.4 |
| 67.50 | 14.1 | 4.7 | 28.1 |
| 90.00 | 7.9 | 2.8 | 16.4 |
| 112.50 | 8.0 | 3.5 | 18.5 |
| 135.00 | 9.6 | 4.2 | 22.1 |
| 157.50 | 13.4 | 6.8 | 33.8 |
| 180.00 | 19.5 | 9.6 | 48.4 |
| 202.50 | 12.4 | 5.5 | 28.9 |
| 225.00 | 14.0 | 6.3 | 33.0 |
| 247.50 | 15.6 | 5.8 | 33.1 |
| 270.00 | 22.4 | 7.5 | 44.9 |
| 292.50 | 19.8 | 8.8 | 46.3 |
| 315.00 | 26.6 | 9.6 | 55.6 |
| 337.50 | 11.0 | 4.6 | 24.9 |

LOCATION 12

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 11.4 | 4.0 | 23.4 |
| 22.50 | 6.4 | 1.6 | 11.3 |
| 45.00 | 7.7 | 1.8 | 12.9 |
| 67.50 | 9.3 | 2.7 | 17.3 |
| 90.00 | 8.4 | 1.9 | 14.2 |
| 112.50 | 8.4 | 1.9 | 14.2 |
| 135.00 | 6.3 | 1.3 | 10.3 |
| 157.50 | 6.3 | 1.9 | 12.1 |
| 180.00 | 16.8 | 8.4 | 42.0 |
| 202.50 | 21.1 | 8.6 | 47.1 |
| 225.00 | 14.0 | 5.6 | 30.7 |
| 247.50 | 13.9 | 5.6 | 30.5 |
| 270.00 | 12.3 | 4.9 | 26.9 |
| 292.50 | 11.4 | 5.1 | 26.7 |
| 315.00 | 16.1 | 8.0 | 40.0 |
| 337.50 | 7.8 | 3.3 | 17.7 |

## TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
## PET PLAZA-GREENHOUSE AND NORTH WALL

LOCATION 13

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 12.3 | 3.2 | 21.9 |
| 22.50 | 9.1 | 1.9 | 14.7 |
| 45.00 | 9.6 | 2.9 | 18.4 |
| 67.50 | 11.8 | 4.0 | 23.8 |
| 90.00 | 6.5 | 2.0 | 12.5 |
| 112.50 | 6.4 | 2.2 | 12.9 |
| 135.00 | 5.4 | 1.2 | 8.8 |
| 157.50 | 7.9 | 2.7 | 16.1 |
| 180.00 | 16.0 | 7.6 | 38.7 |
| 202.50 | 13.8 | 5.2 | 29.3 |
| 225.00 | 9.0 | 3.3 | 18.8 |
| 247.50 | 13.2 | 5.6 | 30.0 |
| 270.00 | 21.2 | 7.2 | 42.9 |
| 292.50 | 16.2 | 7.7 | 39.1 |
| 315.00 | 22.3 | 9.7 | 51.3 |
| 337.50 | 9.8 | 4.2 | 22.5 |

LOCATION 14

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 7.4 | 2.0 | 13.2 |
| 22.50 | 8.3 | 1.7 | 13.5 |
| 45.00 | 8.0 | 1.9 | 13.8 |
| 67.50 | 7.7 | 2.3 | 14.6 |
| 90.00 | 5.6 | 1.9 | 11.3 |
| 112.50 | 4.8 | 1.1 | 8.1 |
| 135.00 | 5.2 | 1.4 | 9.3 |
| 157.50 | 7.9 | 3.0 | 16.8 |
| 180.00 | 12.8 | 4.3 | 25.6 |
| 202.50 | 11.9 | 3.3 | 21.7 |
| 225.00 | 7.2 | 2.5 | 14.8 |
| 247.50 | 12.7 | 6.2 | 31.4 |
| 270.00 | 21.1 | 7.3 | 43.0 |
| 292.50 | 20.3 | 9.9 | 50.1 |
| 315.00 | 28.0 | 10.3 | 58.9 |
| 337.50 | 10.6 | 5.2 | 26.3 |

LOCATION 17

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 7.1 | 1.7 | 12.2 |
| 22.50 | 8.2 | 2.1 | 14.5 |
| 45.00 | 7.0 | 1.6 | 11.7 |
| 67.50 | 10.3 | 3.5 | 20.8 |
| 90.00 | 7.6 | 1.9 | 13.4 |
| 112.50 | 7.7 | 1.8 | 13.2 |
| 135.00 | 6.0 | 1.5 | 10.5 |
| 157.50 | 4.8 | .9 | 7.5 |
| 180.00 | 6.7 | 2.8 | 15.2 |
| 202.50 | 8.1 | 3.2 | 17.6 |
| 225.00 | 7.1 | 2.0 | 13.1 |
| 247.50 | 6.2 | 1.8 | 11.7 |
| 270.00 | 7.6 | 2.9 | 16.3 |
| 292.50 | 6.8 | 2.8 | 15.2 |
| 315.00 | 6.5 | 2.5 | 14.2 |
| 337.50 | 3.9 | .5 | 5.5 |

LOCATION 18

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 21.1 | 10.4 | 52.2 |
| 22.50 | 20.8 | 8.3 | 45.5 |
| 45.00 | 30.4 | 13.2 | 70.1 |
| 67.50 | 46.3 | 16.9 | 97.1 |
| 90.00 | 58.9 | 19.4 | 117.1 |
| 112.50 | 61.7 | 17.2 | 113.3 |
| 135.00 | 47.8 | 16.4 | 97.0 |
| 157.50 | 10.5 | 4.5 | 24.0 |
| 180.00 | 14.2 | 7.5 | 36.7 |
| 202.50 | 11.0 | 6.3 | 30.0 |
| 225.00 | 10.3 | 5.6 | 27.0 |
| 247.50 | 13.3 | 6.6 | 33.2 |
| 270.00 | 11.6 | 5.1 | 27.0 |
| 292.50 | 34.4 | 17.3 | 86.4 |
| 315.00 | 39.4 | 15.6 | 86.2 |
| 337.50 | 20.1 | 10.5 | 51.6 |

## TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
## PET PLAZA-GREENHOUSE AND NORTH WALL

LOCATION  20

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 29.0 | 11.6 | 63.7 |
| 22.50 | 25.7 | 9.6 | 54.3 |
| 45.00 | 20.0 | 8.7 | 46.0 |
| 67.50 | 22.9 | 10.8 | 55.5 |
| 90.00 | 23.8 | 10.2 | 54.3 |
| 112.50 | 30.0 | 11.5 | 64.4 |
| 135.00 | 33.2 | 11.5 | 67.5 |
| 157.50 | 16.5 | 8.2 | 41.3 |
| 180.00 | 19.6 | 11.8 | 55.1 |
| 202.50 | 18.5 | 9.5 | 47.1 |
| 225.00 | 15.3 | 8.0 | 39.4 |
| 247.50 | 14.1 | 7.7 | 37.3 |
| 270.00 | 12.2 | 7.6 | 35.0 |
| 292.50 | 9.5 | 5.2 | 25.0 |
| 315.00 | 20.7 | 11.1 | 54.0 |
| 337.50 | 11.9 | 5.9 | 29.6 |

TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES

PET PLAZA-GREENHOUSE AND NORTH WALL

* *  GREATEST VALUES  * *

| | UMEAN/UINF (PERCENT) | | | | | URMS/UINF (PERCENT) | | | | | UMEAN+3*RMS/UINF (PERCENT) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOC | AZ | MEAN | RMS | M+3RMS | | LOC | AZ | MEAN | RMS | M+3RMS | LOC | AZ | MEAN | RMS | M+3RMS |
| 4 | 180.0 | 62.7 | 19.4 | 121.0 | | 4 | 0.0 | 62.2 | 25.4 | 138.4 | 4 | 0.0 | 62.2 | 25.4 | 138.4 |
| 4 | 0.0 | 62.2 | 25.4 | 138.4 | | 3 | 292.5 | 56.2 | 20.3 | 117.0 | 4 | 180.0 | 62.7 | 19.4 | 121.0 |
| 3 | 45.0 | 62.1 | 14.4 | 105.3 | | 4 | 180.0 | 62.7 | 19.4 | 121.0 | 18 | 90.0 | 58.9 | 19.4 | 117.1 |
| 18 | 112.5 | 61.7 | 17.2 | 113.3 | | 18 | 90.0 | 58.9 | 19.4 | 117.1 | 3 | 292.5 | 56.2 | 20.3 | 117.0 |
| 3 | 202.5 | 61.1 | 12.7 | 99.2 | | 3 | 67.5 | 41.2 | 19.1 | 98.6 | 18 | 112.5 | 61.7 | 17.2 | 113.3 |
| 3 | 270.0 | 60.8 | 16.5 | 110.3 | | 18 | 292.5 | 34.4 | 17.3 | 86.4 | 3 | 270.0 | 60.8 | 16.5 | 110.3 |
| 3 | 247.5 | 59.7 | 14.5 | 103.2 | | 18 | 112.5 | 61.7 | 17.2 | 113.3 | 3 | 315.0 | 55.6 | 17.0 | 106.6 |
| 18 | 90.0 | 58.9 | 19.4 | 117.1 | | 8 | 292.5 | 37.5 | 17.2 | 89.1 | 3 | 45.0 | 62.1 | 14.4 | 105.3 |
| 3 | 292.5 | 56.2 | 20.3 | 117.0 | | 3 | 315.0 | 55.6 | 17.0 | 106.6 | 3 | 247.5 | 59.7 | 14.5 | 103.2 |
| 3 | 225.0 | 55.9 | 12.9 | 94.5 | | 18 | 67.5 | 46.3 | 16.9 | 97.1 | 3 | 202.5 | 61.1 | 12.7 | 99.2 |

## TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
### PET PLAZA-GREENHOUSE AND CANOPY

LOCATION 3

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 52.1 | 15.4 | 98.4 |
| 22.50 | 53.8 | 12.8 | 92.1 |
| 45.00 | 61.8 | 13.4 | 102.0 |
| 67.50 | 49.1 | 19.1 | 106.4 |
| 90.00 | 20.2 | 9.2 | 47.8 |
| 112.50 | 21.6 | 9.4 | 49.7 |
| 135.00 | 32.7 | 11.0 | 65.8 |
| 157.50 | 27.8 | 14.8 | 72.2 |
| 180.00 | 59.6 | 13.8 | 101.1 |
| 202.50 | 56.9 | 12.0 | 92.8 |
| 225.00 | 34.6 | 11.4 | 88.7 |
| 247.50 | 53.5 | 11.4 | 87.7 |
| 270.00 | 52.5 | 13.2 | 92.0 |
| 292.50 | 49.9 | 18.6 | 105.6 |
| 315.00 | 48.6 | 14.6 | 92.4 |
| 337.50 | 25.3 | 12.1 | 61.6 |

LOCATION 4

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 54.9 | 22.4 | 122.1 |
| 22.50 | 30.8 | 14.5 | 74.5 |
| 45.00 | 15.8 | 8.9 | 42.4 |
| 67.50 | 22.3 | 10.7 | 54.5 |
| 90.00 | 21.2 | 9.1 | 48.4 |
| 112.50 | 15.8 | 7.1 | 36.9 |
| 135.00 | 24.6 | 10.4 | 55.8 |
| 157.50 | 42.4 | 15.1 | 87.5 |
| 180.00 | 57.1 | 18.7 | 113.1 |
| 202.50 | 43.4 | 12.3 | 80.2 |
| 225.00 | 35.5 | 9.9 | 65.1 |
| 247.50 | 34.5 | 9.7 | 63.6 |
| 270.00 | 34.6 | 10.5 | 66.0 |
| 292.50 | 18.2 | 7.3 | 40.1 |
| 315.00 | 19.2 | 7.4 | 41.5 |
| 337.50 | 12.7 | 6.6 | 32.6 |

LOCATION 5

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 21.7 | 13.9 | 63.3 |
| 22.50 | 10.1 | 5.2 | 25.7 |
| 45.00 | 11.6 | 6.5 | 31.2 |
| 67.50 | 21.7 | 11.3 | 55.7 |
| 90.00 | 14.8 | 7.1 | 36.2 |
| 112.50 | 11.8 | 5.0 | 27.0 |
| 135.00 | 17.3 | 8.4 | 42.4 |
| 157.50 | 14.3 | 6.0 | 32.1 |
| 180.00 | 22.6 | 10.5 | 54.2 |
| 202.50 | 31.4 | 14.0 | 73.4 |
| 225.00 | 28.3 | 9.4 | 56.4 |
| 247.50 | 20.0 | 8.8 | 46.3 |
| 270.00 | 19.4 | 8.5 | 44.8 |
| 292.50 | 34.3 | 11.8 | 69.6 |
| 315.00 | 33.5 | 10.6 | 65.4 |
| 337.50 | 19.1 | 8.2 | 43.6 |

LOCATION 8

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 8.5 | 5.6 | 25.3 |
| 22.50 | 6.2 | 3.0 | 15.1 |
| 45.00 | 4.7 | 3.1 | 14.1 |
| 67.50 | 5.0 | 3.6 | 15.9 |
| 90.00 | 6.6 | 4.2 | 19.1 |
| 112.50 | 5.9 | 3.8 | 17.2 |
| 135.00 | 7.2 | 6.0 | 25.4 |
| 157.50 | 11.5 | 8.3 | 36.2 |
| 180.00 | 36.4 | 11.6 | 71.2 |
| 202.50 | 33.1 | 10.7 | 65.1 |
| 225.00 | 27.7 | 9.8 | 57.0 |
| 247.50 | 26.0 | 9.5 | 54.5 |
| 270.00 | 22.1 | 8.8 | 48.3 |
| 292.50 | 6.0 | 4.7 | 20.2 |
| 315.00 | 6.8 | 4.7 | 20.8 |
| 337.50 | 4.0 | 2.9 | 12.6 |

## TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
## PET PLAZA-GREENHOUSE AND CANOPY

LOCATION 9

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 11.4 | 6.7 | 37.5 |
| 22.50 | 3.3 | 1.8 | 8.6 |
| 45.00 | 3.6 | 1.7 | 8.6 |
| 67.50 | 4.1 | 2.4 | 11.3 |
| 90.00 | 5.4 | 3.6 | 16.1 |
| 112.50 | 4.0 | 2.1 | 10.4 |
| 135.00 | 7.2 | 5.6 | 24.0 |
| 157.50 | 5.5 | 3.7 | 16.7 |
| 180.00 | 17.4 | 10.8 | 49.8 |
| 202.50 | 29.7 | 10.5 | 61.2 |
| 225.00 | 31.4 | 10.1 | 61.8 |
| 247.50 | 28.4 | 10.1 | 58.6 |
| 270.00 | 24.8 | 9.8 | 54.1 |
| 292.50 | 7.0 | 5.7 | 24.1 |
| 315.00 | 5.0 | 3.2 | 14.5 |
| 337.50 | 3.4 | 2.2 | 9.9 |

LOCATION 10

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 14.5 | 6.4 | 33.6 |
| 22.50 | 10.7 | 3.5 | 21.3 |
| 45.00 | 6.4 | 2.0 | 12.4 |
| 67.50 | 6.7 | 2.2 | 13.1 |
| 90.00 | 5.5 | 2.9 | 14.3 |
| 112.50 | 5.8 | 2.5 | 13.4 |
| 135.00 | 5.5 | 3.8 | 17.0 |
| 157.50 | 10.9 | 6.9 | 31.5 |
| 180.00 | 24.2 | 11.4 | 58.5 |
| 202.50 | 19.7 | 11.6 | 54.4 |
| 225.00 | 16.8 | 9.3 | 44.8 |
| 247.50 | 20.4 | 9.3 | 48.3 |
| 270.00 | 11.0 | 7.2 | 32.8 |
| 292.50 | 7.2 | 4.5 | 20.7 |
| 315.00 | 9.1 | 4.7 | 23.2 |
| 337.50 | 6.8 | 2.5 | 14.4 |

LOCATION 11

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 15.0 | 6.2 | 33.5 |
| 22.50 | 9.9 | 3.6 | 20.7 |
| 45.00 | 6.5 | 2.0 | 12.5 |
| 67.50 | 7.0 | 2.5 | 14.4 |
| 90.00 | 4.4 | 2.5 | 11.8 |
| 112.50 | 4.6 | 2.3 | 11.5 |
| 135.00 | 6.2 | 3.9 | 17.9 |
| 157.50 | 7.9 | 4.0 | 19.9 |
| 180.00 | 7.9 | 5.0 | 23.0 |
| 202.50 | 18.2 | 8.5 | 43.6 |
| 225.00 | 22.1 | 8.5 | 47.5 |
| 247.50 | 16.6 | 7.8 | 40.0 |
| 270.00 | 16.5 | 8.2 | 41.1 |
| 292.50 | 7.9 | 4.7 | 22.2 |
| 315.00 | 9.8 | 4.9 | 24.6 |
| 337.50 | 7.1 | 2.7 | 15.2 |

LOCATION 12

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 13.6 | 4.5 | 27.0 |
| 22.50 | 12.2 | 3.6 | 23.1 |
| 45.00 | 8.0 | 2.0 | 14.2 |
| 67.50 | 7.7 | 2.0 | 13.7 |
| 90.00 | 5.4 | 2.2 | 12.0 |
| 112.50 | 5.7 | 2.0 | 11.6 |
| 135.00 | 3.6 | 1.7 | 8.6 |
| 157.50 | 6.0 | 4.3 | 18.9 |
| 180.00 | 21.8 | 11.2 | 55.4 |
| 202.50 | 13.1 | 7.3 | 35.0 |
| 225.00 | 8.3 | 4.7 | 22.4 |
| 247.50 | 6.9 | 4.1 | 19.1 |
| 270.00 | 5.8 | 3.4 | 15.9 |
| 292.50 | 9.1 | 5.3 | 25.0 |
| 315.00 | 9.3 | 5.2 | 24.8 |
| 337.50 | 7.1 | 2.9 | 15.8 |

# TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
## PET PLAZA-GREENHOUSE AND CANOPY

**LOCATION 13**

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 11.4 | 4.5 | 24.8 |
| 22.50 | 8.8 | 3.0 | 17.8 |
| 45.00 | 6.4 | 1.9 | 12.3 |
| 67.50 | 5.7 | 1.9 | 11.6 |
| 90.00 | 3.3 | 2.1 | 9.7 |
| 112.50 | 4.3 | 2.1 | 10.7 |
| 135.00 | 3.4 | 2.3 | 10.2 |
| 157.50 | 5.8 | 3.3 | 15.8 |
| 180.00 | 7.8 | 4.8 | 22.1 |
| 202.50 | 7.3 | 5.0 | 22.3 |
| 225.00 | 9.9 | 5.5 | 26.5 |
| 247.50 | 12.8 | 5.7 | 30.0 |
| 270.00 | 11.2 | 5.4 | 27.3 |
| 292.50 | 10.1 | 6.6 | 30.0 |
| 315.00 | 14.7 | 8.4 | 39.7 |
| 337.50 | 6.9 | 3.2 | 16.6 |

**LOCATION 14**

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 9.8 | 3.9 | 21.5 |
| 22.50 | 6.8 | 2.8 | 15.3 |
| 45.00 | 5.4 | 1.6 | 10.1 |
| 67.50 | 6.3 | 2.1 | 12.4 |
| 90.00 | 3.9 | 2.3 | 10.9 |
| 112.50 | 4.7 | 2.3 | 11.5 |
| 135.00 | 4.5 | 2.6 | 12.4 |
| 157.50 | 4.6 | 2.4 | 11.8 |
| 180.00 | 6.5 | 2.3 | 13.3 |
| 202.50 | 4.7 | 2.4 | 12.0 |
| 225.00 | 6.6 | 4.8 | 21.0 |
| 247.50 | 11.0 | 5.7 | 28.1 |
| 270.00 | 10.5 | 5.7 | 27.6 |
| 292.50 | 13.7 | 8.2 | 38.4 |
| 315.00 | 13.7 | 8.3 | 38.7 |
| 337.50 | 6.3 | 3.0 | 15.2 |

**LOCATION 17**

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 5.3 | 1.8 | 10.6 |
| 22.50 | 5.7 | 1.5 | 10.2 |
| 45.00 | 5.0 | 1.5 | 9.4 |
| 67.50 | 5.2 | 1.7 | 10.3 |
| 90.00 | 7.6 | 2.5 | 15.0 |
| 112.50 | 4.1 | 1.7 | 9.3 |
| 135.00 | 3.1 | 1.6 | 8.0 |
| 157.50 | 1.9 | 1.2 | 5.4 |
| 180.00 | 4.5 | 3.3 | 14.4 |
| 202.50 | 2.5 | 1.5 | 6.9 |
| 225.00 | 2.9 | 2.2 | 9.4 |
| 247.50 | 4.6 | 2.8 | 13.0 |
| 270.00 | 5.4 | 3.5 | 15.7 |
| 292.50 | 5.7 | 4.3 | 18.5 |
| 315.00 | 8.3 | 5.7 | 25.3 |
| 337.50 | 3.7 | 1.2 | 7.4 |

**LOCATION 18**

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 17.4 | 9.3 | 45.3 |
| 22.50 | 15.2 | 7.4 | 37.5 |
| 45.00 | 32.0 | 14.3 | 74.8 |
| 67.50 | 46.7 | 17.4 | 98.9 |
| 90.00 | 55.8 | 20.5 | 117.4 |
| 112.50 | 69.4 | 18.3 | 124.4 |
| 135.00 | 54.2 | 17.5 | 106.8 |
| 157.50 | 13.3 | 6.4 | 32.4 |
| 180.00 | 14.5 | 6.8 | 35.0 |
| 202.50 | 13.4 | 6.1 | 31.7 |
| 225.00 | 12.2 | 5.2 | 27.9 |
| 247.50 | 14.6 | 5.4 | 30.8 |
| 270.00 | 9.9 | 3.8 | 21.3 |
| 292.50 | 23.5 | 12.0 | 59.4 |
| 315.00 | 36.6 | 14.8 | 81.1 |
| 337.50 | 17.4 | 9.1 | 44.8 |

## TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
## PET PLAZA-GREENHOUSE AND CANOPY

LOCATION 20

| WIND AZIMUTH | UMEAN/UINF (PERCENT) | URMS/UINF (PERCENT) | UMEAN+3*URMS/UINF (PERCENT) |
|---|---|---|---|
| 0.00 | 25.4 | 10.2 | 56.1 |
| 22.50 | 27.8 | 10.2 | 58.5 |
| 45.00 | 16.6 | 8.4 | 41.7 |
| 67.50 | 18.8 | 9.3 | 46.8 |
| 90.00 | 23.6 | 10.4 | 54.7 |
| 112.50 | 31.2 | 10.9 | 64.0 |
| 135.00 | 31.3 | 9.9 | 61.2 |
| 157.50 | 21.0 | 9.5 | 49.5 |
| 180.00 | 17.7 | 9.2 | 45.3 |
| 202.50 | 20.2 | 8.6 | 45.9 |
| 225.00 | 16.6 | 7.5 | 39.2 |
| 247.50 | 17.6 | 8.7 | 43.8 |
| 270.00 | 18.4 | 9.1 | 45.6 |
| 292.50 | 10.5 | 4.8 | 24.9 |
| 315.00 | 17.7 | 7.4 | 40.0 |
| 337.50 | 10.7 | 5.4 | 27.0 |

## TABLE 2--PEDESTRIAN WIND VELOCITIES AND TURBULENCE INTENSITIES
### PET PLAZA-GREENHOUSE AND CANOPY

* * GREATEST VALUES * *

| UMEAN/UINF (PERCENT) | | | | | URMS/UINF (PERCENT) | | | | | UMEAN+3*RMS/UINF (PERCENT) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOC | AZ | MEAN | RMS | M+3RMS | LOC | AZ | MEAN | RMS | M+3RMS | LOC | AZ | MEAN | RMS | M+3RMS |
| 18 | 112.5 | 69.4 | 18.3 | 124.4 | 4 | 0.0 | 54.9 | 22.4 | 122.1 | 18 | 112.5 | 69.4 | 18.3 | 124.4 |
| 3 | 45.0 | 61.8 | 13.4 | 102.0 | 18 | 90.0 | 55.8 | 20.5 | 117.4 | 4 | 0.0 | 54.9 | 22.4 | 122.1 |
| 3 | 180.0 | 59.6 | 13.8 | 101.1 | 3 | 67.5 | 49.1 | 19.1 | 106.4 | 18 | 90.0 | 55.8 | 20.5 | 117.4 |
| 4 | 180.0 | 57.1 | 18.7 | 113.1 | 4 | 180.0 | 57.1 | 18.7 | 113.1 | 4 | 180.0 | 57.1 | 18.7 | 113.1 |
| 3 | 202.5 | 56.9 | 12.0 | 92.8 | 3 | 292.5 | 49.9 | 18.6 | 105.6 | 18 | 135.0 | 54.2 | 17.5 | 106.8 |
| 18 | 90.0 | 55.8 | 20.5 | 117.4 | 18 | 112.5 | 69.4 | 18.3 | 124.4 | 3 | 67.5 | 49.1 | 19.1 | 106.4 |
| 4 | 0.0 | 54.9 | 22.4 | 122.1 | 18 | 135.0 | 54.2 | 17.5 | 106.8 | 3 | 292.5 | 49.9 | 18.6 | 105.6 |
| 3 | 225.0 | 54.6 | 11.4 | 88.7 | 18 | 67.5 | 46.7 | 17.4 | 98.9 | 3 | 45.0 | 61.8 | 13.4 | 102.0 |
| 18 | 135.0 | 54.2 | 17.5 | 106.8 | 3 | 0.0 | 52.1 | 15.4 | 98.4 | 3 | 180.0 | 59.6 | 13.8 | 101.1 |
| 3 | 22.5 | 53.8 | 12.8 | 92.1 | 4 | 157.5 | 42.4 | 15.1 | 87.5 | 18 | 67.5 | 46.7 | 17.4 | 98.9 |

TABLE 3

SUMMARY OF WIND EFFECTS ON PEOPLE

|  | Beaufort number | Speed (mph) | Effects |
|---|---|---|---|
| Calm, light air | 0, 1 | 0- 3 | Calm, no noticeable wind |
| Light breeze | 2 | 4- 7 | Wind felt on face |
| Gentle breeze | 3 | 8-12 | Wind extends light flag<br>Hair is disturbed<br>Clothing flaps |
| Moderate breeze | 4 | 13-18 | Raises dust, dry soil and<br>  loose paper<br>Hair disarranged |
| Fresh breeze | 5 | 19-24 | Force of wind felt on body<br>Drifting snow becomes airborne<br>Limit of agreeable wind on land |
| Strong breeze | 6 | 25-31 | Umbrellas used with difficulty<br>Hair blown straight<br>Difficult to walk steadily<br>Wind noise on ears unpleasant<br>Windborne snow above head<br>  height (blizzard) |
| Near gale | 7 | 32-38 | Inconvenience felt when walking |
| Gale | 8 | 39-46 | Generally impedes progress<br>Great difficulty with balance<br>  in gusts |
| Strong gale | 9 | 47-54 | People blown over by gusts |

Note:  Table from Reference 4, p. 40.