Fig 86. View towards the east.

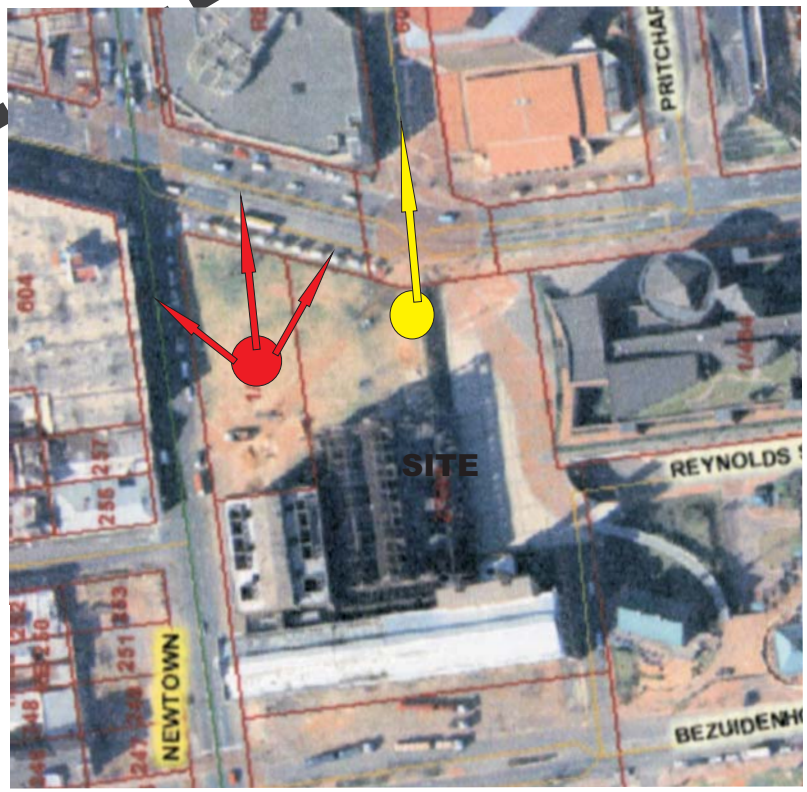


Fig 87. Location of viewpoints.

Views.

Fig 88. View up into Kerk Street.

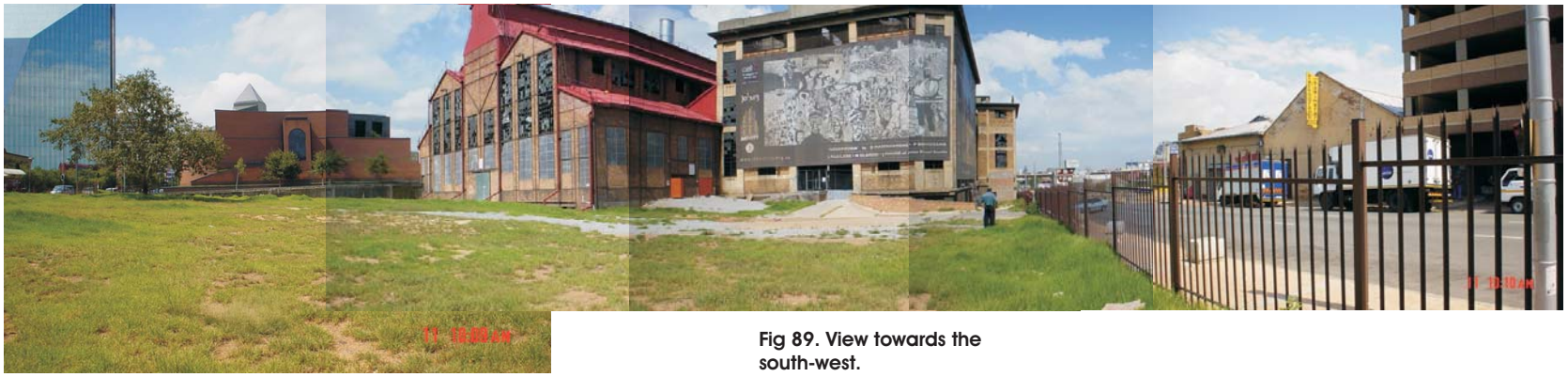


Fig 89. View towards the south-west.

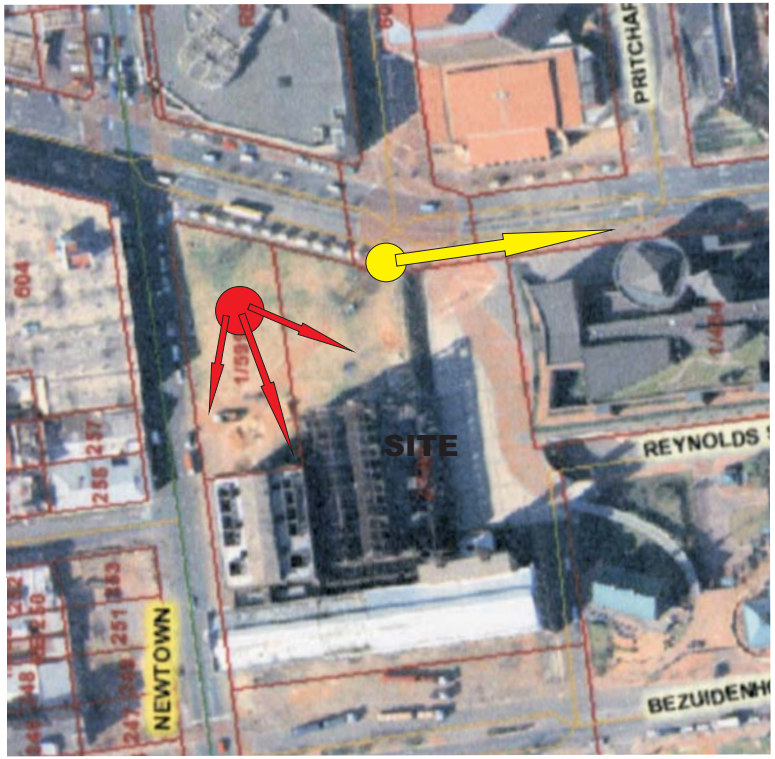


Fig 90. Location of viewpoints.

Fig 91. View south into West Street.

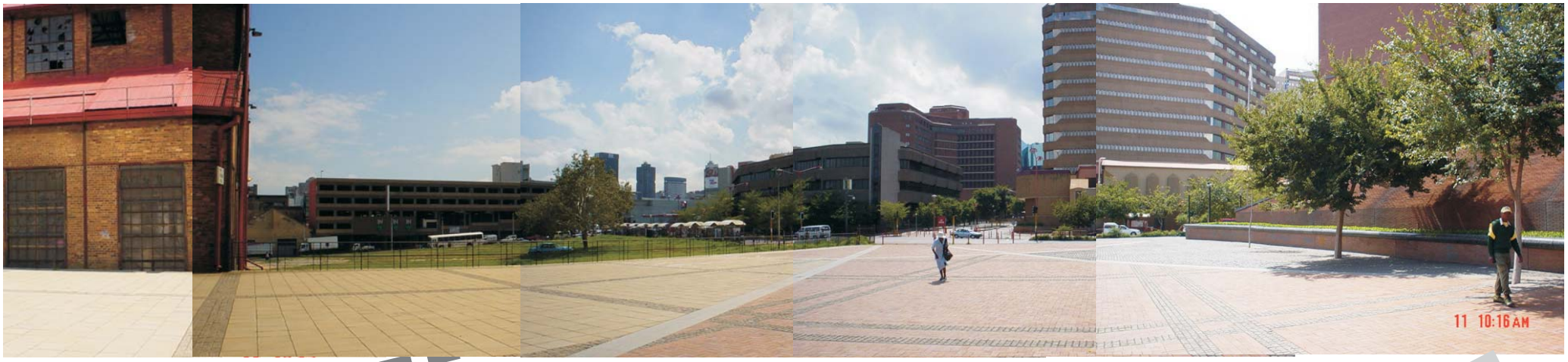


Fig 92. View to east across plaza.

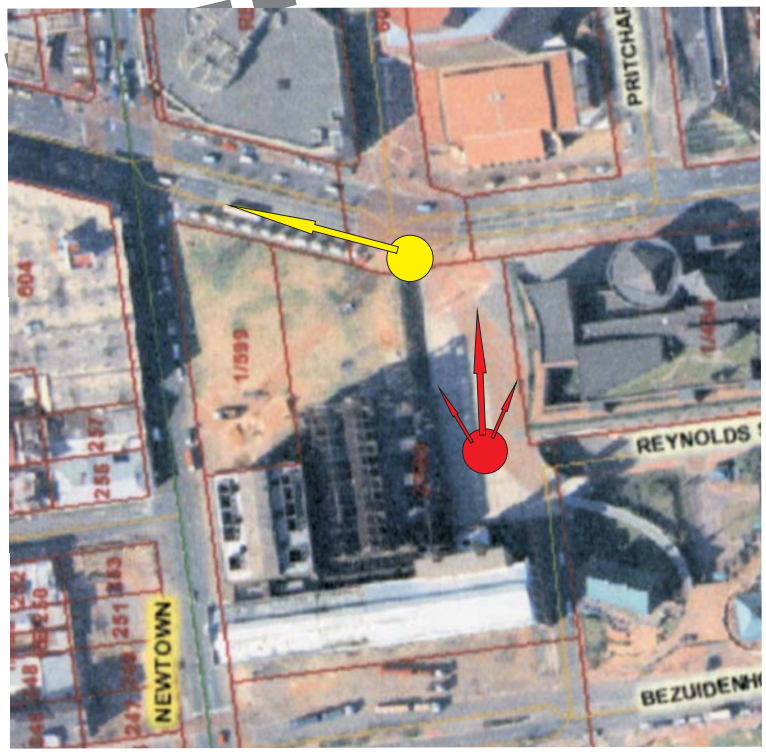


Fig 93. Location of viewpoints.

Fig 94. View to north-east up in West Street.

Fig 95. View to west across plaza.

Fig 96. Location of viewpoint.

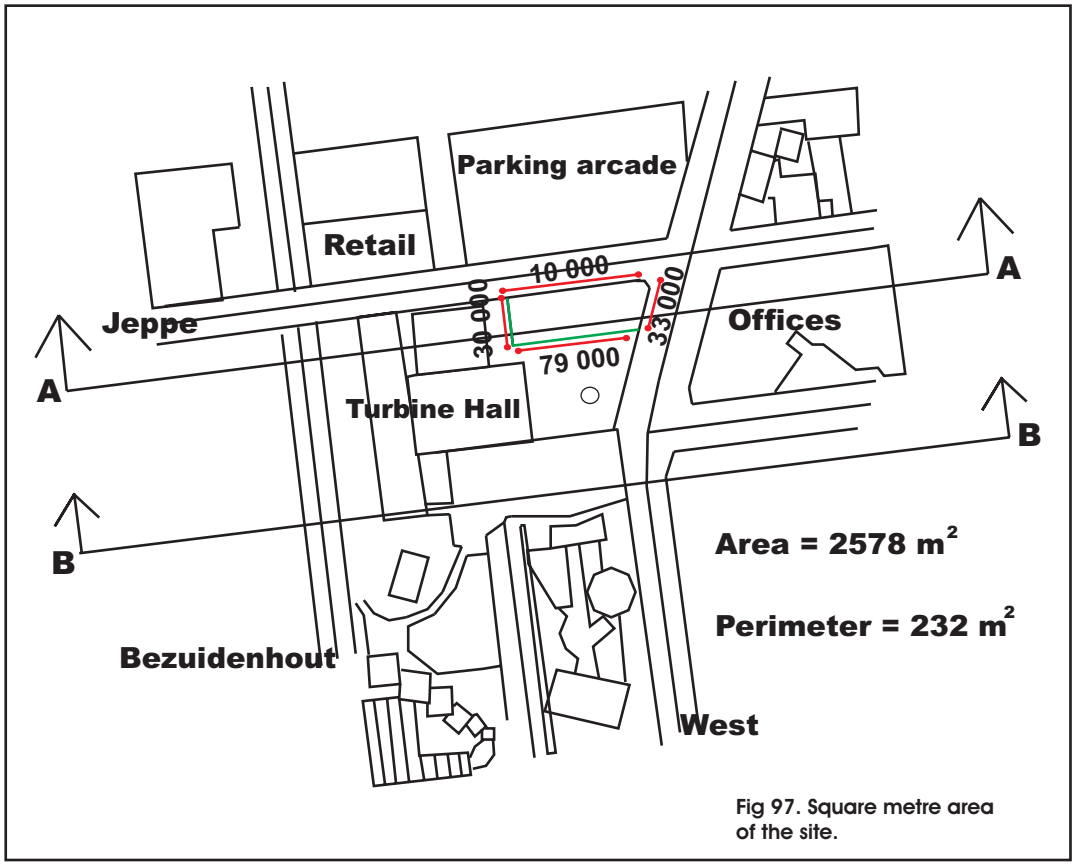


Fig 97. Square metre area of the site.

Fig 98. Site falls with slope of 1.8° towards the west.

Topography

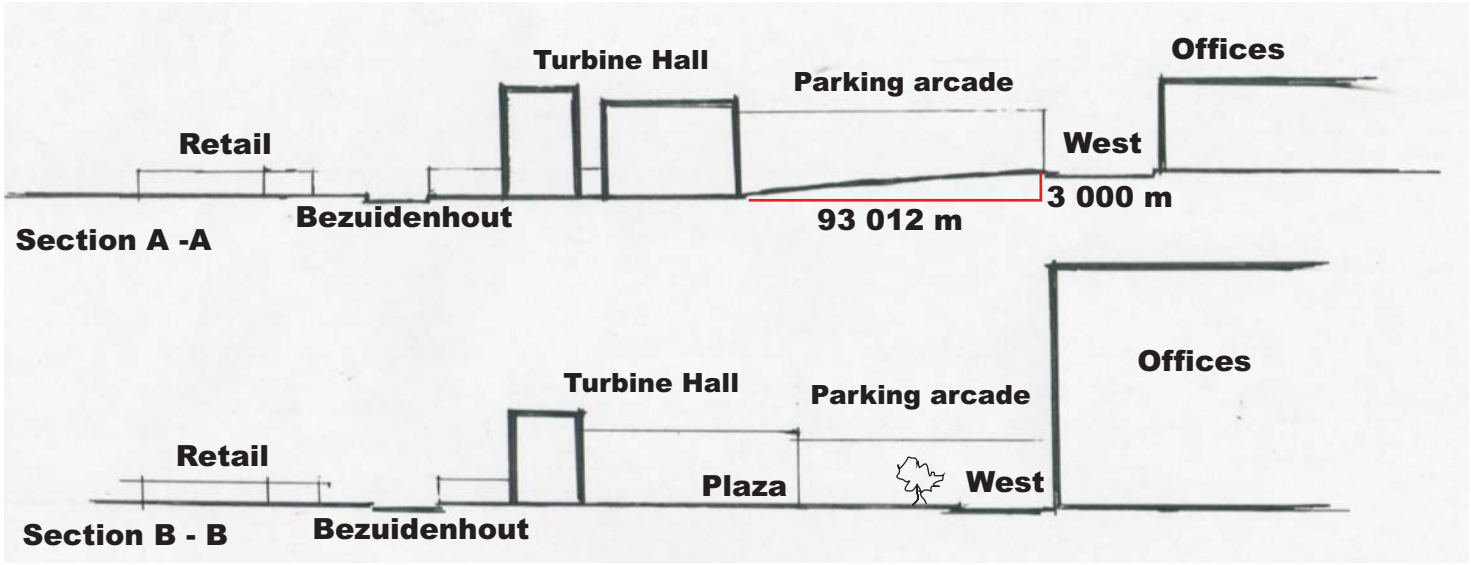


Fig 99. Site sections.

Month	Temperature (° C)				Precipitation		
	Highest Recorded	Average Daily Maximum	Average Daily Minimum	Lowest Recorded	Average Monthly (mm)	Average Number of days with >= 1mm	Highest 24 Hour Rainfall (mm)
January	35	26	15	7	125	16	188
February	34	25	14	6	90	11	56
March	32	24	13	2	91	12	92
April	29	21	10	1	54	9	50
May	26	19	7	-3	13	3	70
June	23	16	4	-8	9	2	31
July	24	17	4	-5	4	1	17
August	26	19	6	-5	6	2	21
September	31	23	9	-3	27	4	62
October	32	24	11	0	72	10	110
November	33	24	13	2	117	15	65
December	32	25	14	4	105	15	102

Fig 100. Statistics on temperatures and rainfall in Johannesburg, 2002.

Macro-climate:
Johannesburg's position: 26 08' S 28 14' E
Height: 1694 m

• Rain:
The average annual rainfall that mainly occurs due to thunderstorms during the summer rainfall season varies between 125 to 375 mm. The rain season occurs November to March, with the peak in January. 50 - 80 Rainy days may be expected. Hail is not uncommon. Winter rainfall varies from 62 to 250 mm.

• Temperature:
Summers are warm to hot, with fairly dry air, relieved by the thunderstorms. Winter days are pleasantly sunny with clear cold to very cold nights. The average daily maximum temperature vary from 26°C in January to 17°C in July, with extremes of 35°C and 24°C respectively. Average daily minimums range from 15 C in January to 4 C in July, with extremes of 7 C and -8 C respectively. [Average climate statistics for Johannesburg]

• Winds:
Prevailing winds are light to moderate and from the north-east direction in summer and from the north-east to north-west direction in winter. The strongest winds occur mainly in spring. Autumn and early winter seem to be the seasons with the lest wind. (Napier, 2000:9.8)

• Sunshine:
The duration of bright sunshine exceeds 80% in the winter and 60% in the summer. % Sunshine has a major influence on how buildings [illegible] regarding comfortability. (Napier, 2000:9.8)

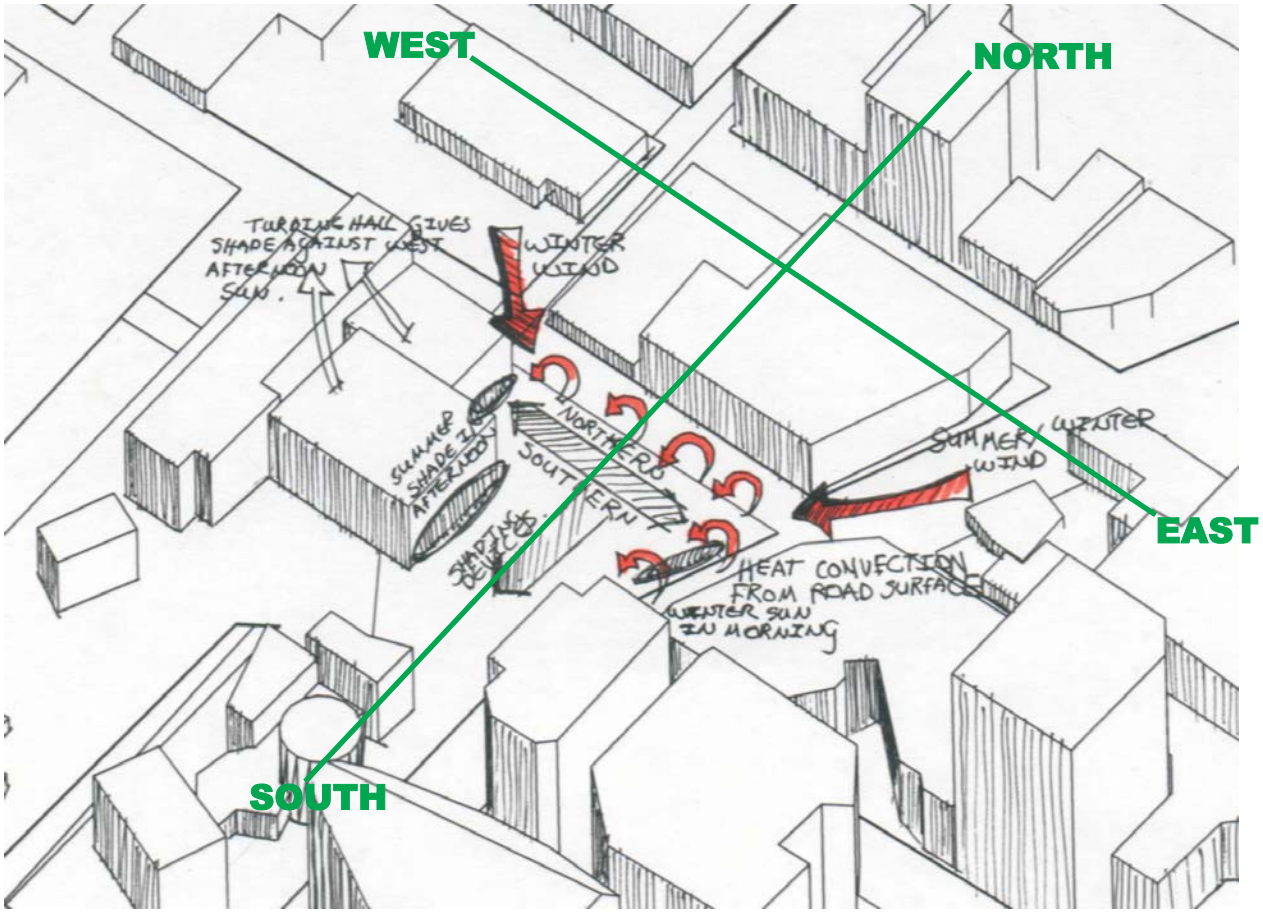


Fig. 101. Site climate.

• Surface temperature:
The most excessive temperatures for Johannesburg reach a maximum and minimum of 35 C and -8 C. These temperatures affects surface temperatures. A surface with a white finish reflects the most heat and has a lower surface temperature. A black surface absorbs the most heat and has the highest surface temperature.

• Relative humidity:
Johannesburg has a relative humidity of 30 - 50 % (Napier, 2000:9.8) Humidity has a major effect on personal comfort. Warm air holds more moisture than cool air. Evaporation and humidity is the lowest during the winter (drier air) and highest during the summer.

Relative humidity is the ratio of water vapour in a given volume of air as a proportion to the maximum amount of water vapour that could be contained in the same volume of air at the same temperature. A high relative humidity reduces the rate of evaporation of perspiration from the skin, which is a cooling process, and which prevents loss of heat from the body and which results in an uncomfortable environment.. Relief may be provided by sufficient ventilation. (Napier, 2000:9.14)

Micro-climate:

• Solar radiation:
Solar radiation is the heat we experience from the sun on the skin. Radiant heat always travels in straight lines and may be reflected or refracted. A body with a reflective surface will absorb far less heat than one with a dark, dull one. Figures for mean solar radiation for Johannesburg ranges from 2000 to 2250 kWh/m /year.

When the sun's radiation passes through the earth's atmosphere its strength is reduced by cloud conditions and pollution. When rays meet the earth's surface at a low angle, they are spread proportionally over a wider area, and will have a lesser heating effect. Sun directly overhead will deliver the strongest radiation. It is important to consider surfaces of buildings that are exposed to the sun. The absorption and reflection of radiant heat from the sun is dependent on the nature and the colour of the surface, and the nature or composition of the material itself. (Napier, 2000:3.2)

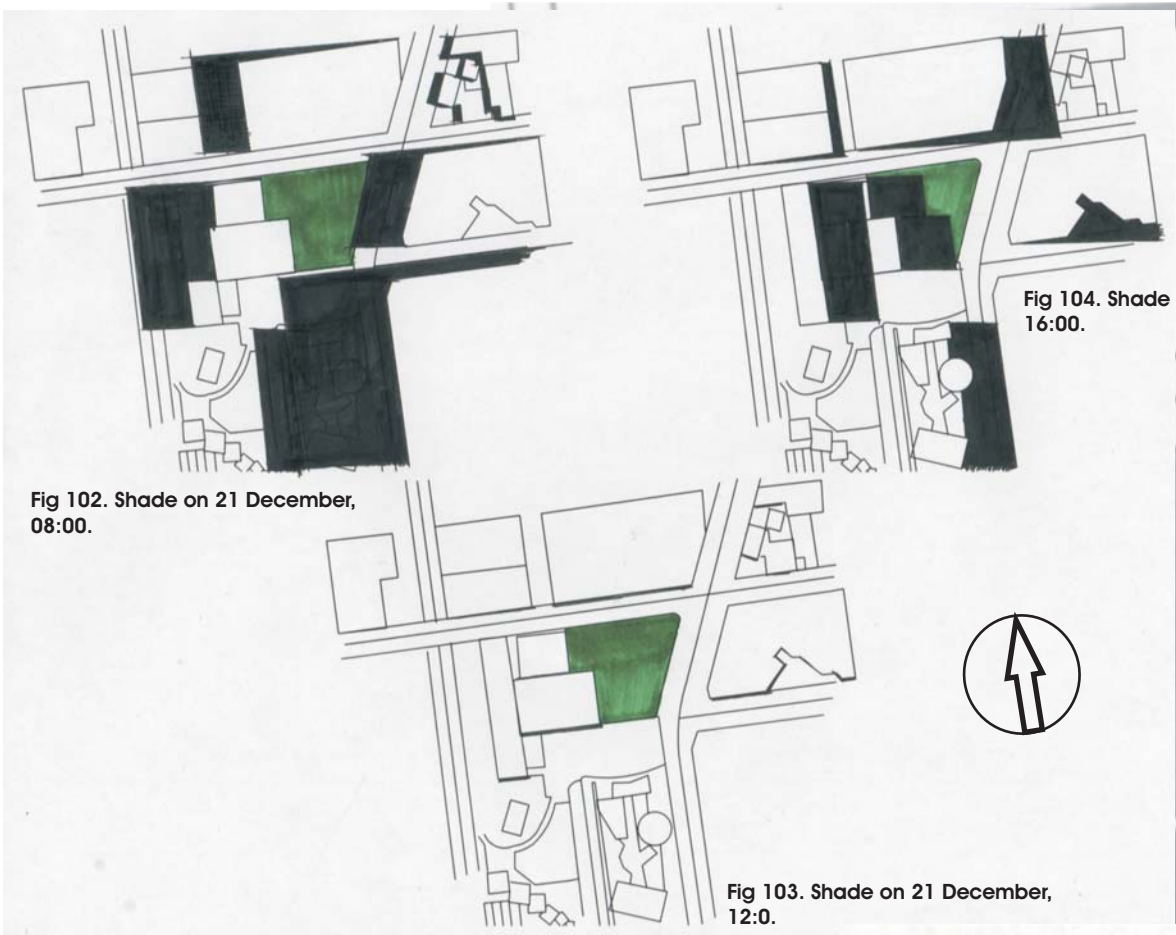
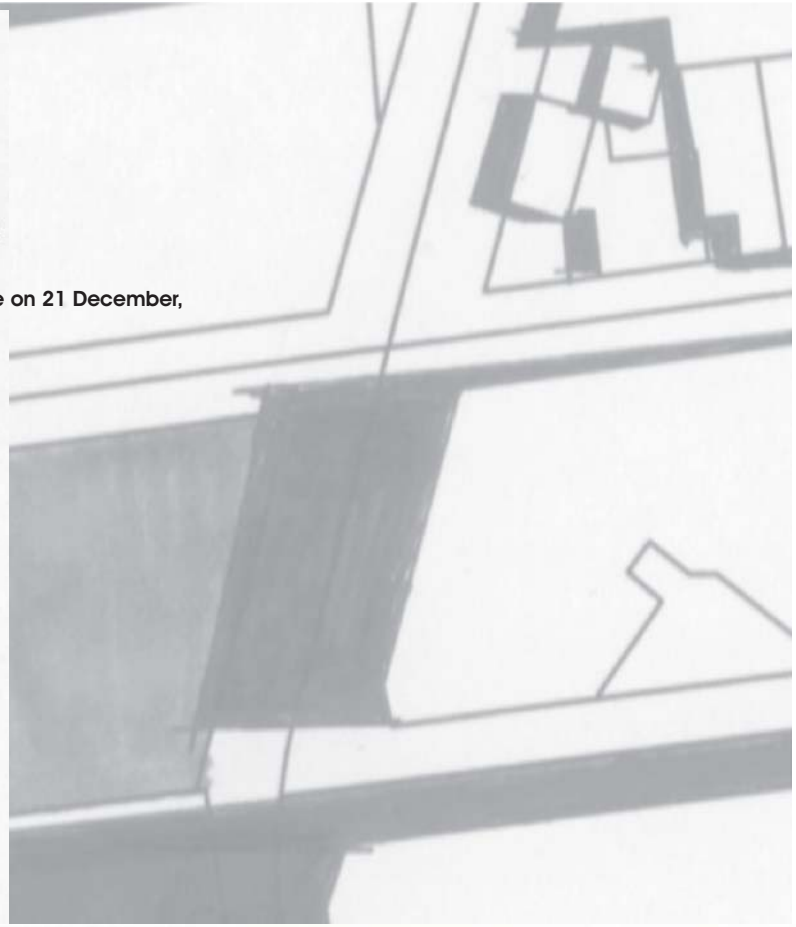


Fig 102. Shade on 21 December, 08:00.

Fig 103. Shade on 21 December, 12:0.

Fig 104. Shade on 21 December, 16:00.



JOHANNESBURG & PRETORIA Latitude (nearest) 26° South

Both cities taken as longitude 25.5°E (Add 4.5° or 18 minutes to solar time)

Solar times		*06.00*	*08.00*	*10.00*	*12.00*	*14.00*	*16.00*	*18.00*
Clock times		06.18	08.18	10.18	12.18	14.18	16.18	18.18
Azimuth	21/12	112E	101E	91E	0	91W	101W	112W
Altitude	21/12	10	35	63	88	63	35	10
Azimuth	21/3 & 9	90E	76E	53E	0	53W	76W	90W
Altitude	21/3 & 9	0	26	51	65	51	26	0
Azimuth	21/6	-	55E	34E	0	34W	55W	-
Altitude	21/6	-	14	32	40	32	14	-

Fig 105. Solar times, azimuth and altitudes of Johannesburg..

Sun angles and shading.

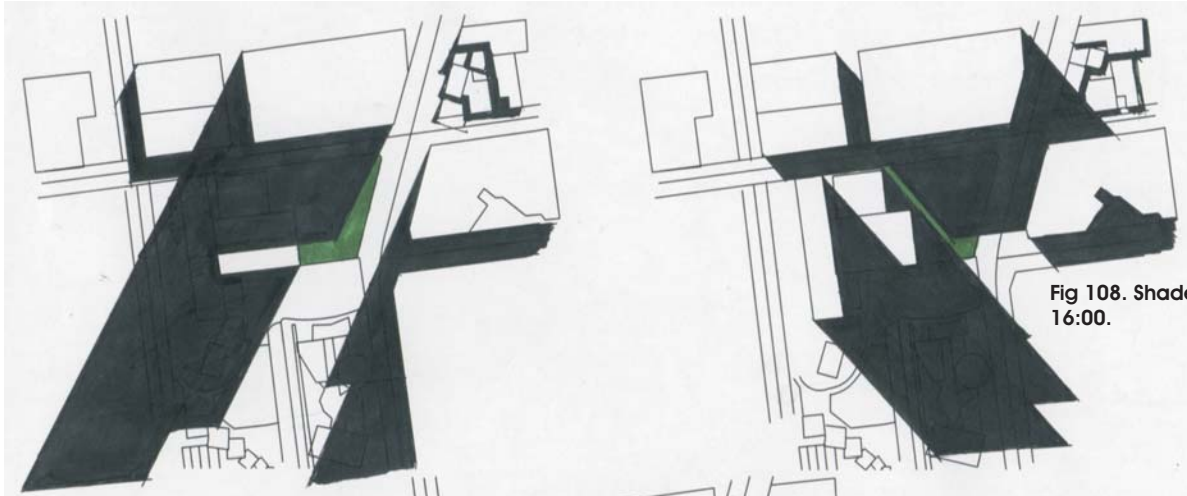
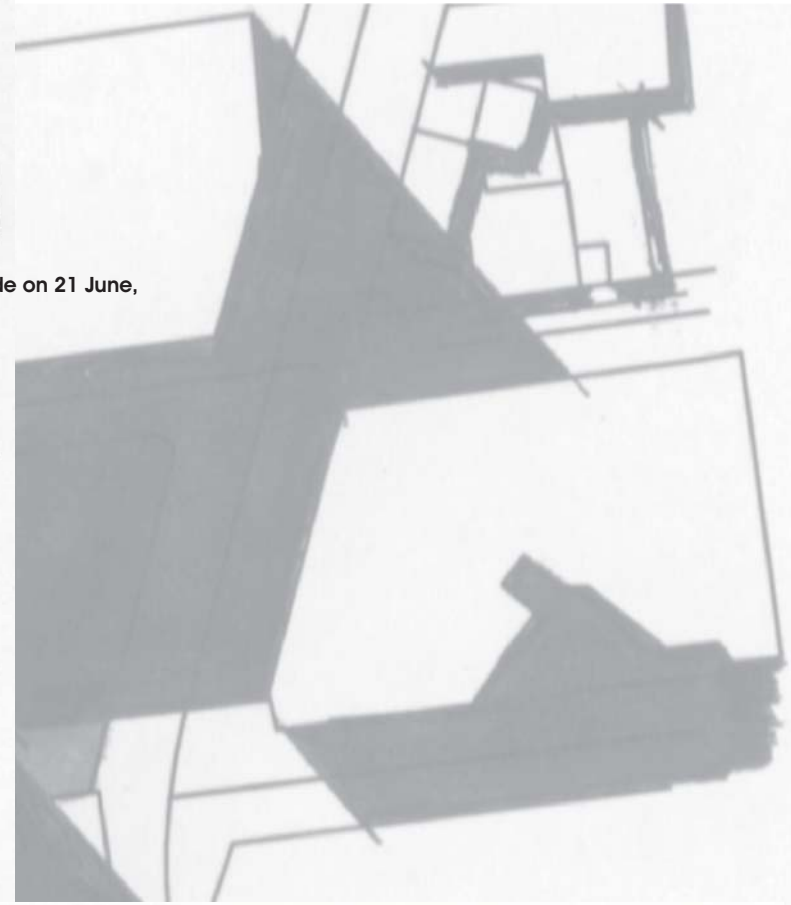


Fig 106. Shade on 21 June, 08:00.

Fig 108. Shade on 21 June, 16:00.

Fig 107. Shade on 21 June, 12:00.



JOHANNESBURG & PRETORIA Latitude (nearest) 26° South

Both cities taken as longitude 25.5°E (Add 4.5° or 18 minutes to solar time)

Solar times		*06.00*	*08.00*	*10.00*	*12.00*	*14.00*	*16.00*	*18.00*
Clock times		06.18	08.18	10.18	12.18	14.18	16.18	18.18
Azimuth	21/12	112E	101E	91E	0	91W	101W	112W
Altitude	21/12	10	35	63	88	63	35	10
Azimuth	21/3 & 9	90E	76E	53E	0	53W	76W	90W
Altitude	21/3 & 9	0	26	51	65	51	26	0
Azimuth	21/6	-	55E	34E	0	34W	55W	-
Altitude	21/6	-	14	32	40	32	14	-

Fig 109. Solar times, azimuth and altitudes of Johannesburg.

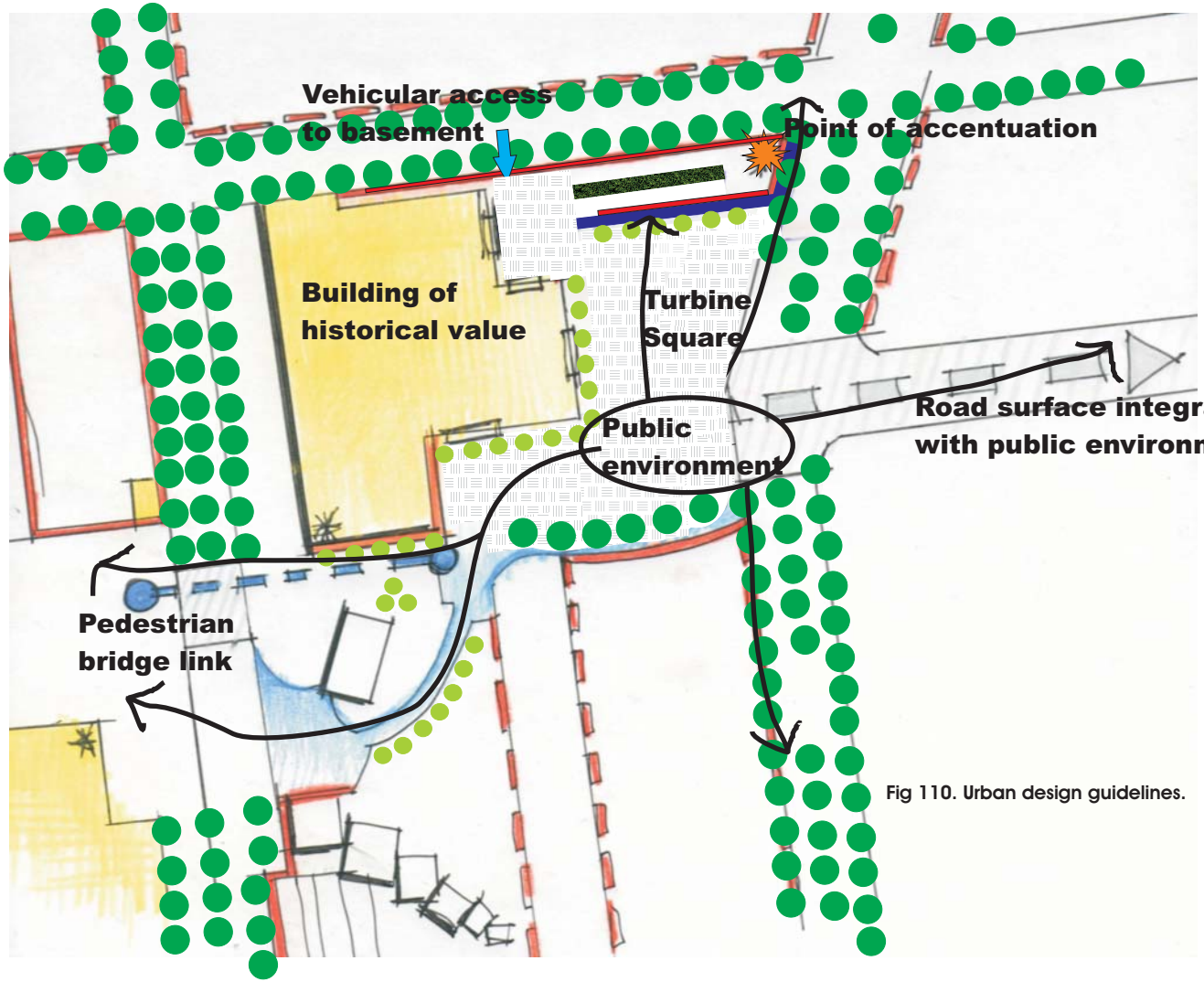


Fig 110. Urban design guidelines.

Mandatory build to line
Desirable build to line
Mandatory colonnades
Boulevard treatment
Tree lined paths

Site Development Parameters:

- Site area: 2578 m
- Coverage: 70%
- Building footprint: 1804 m
- Minimum of 2 storeys and maximum of for storeys.
- The envelope of development sees a maximum of 4110.4 metres square of the development or floor area ratio of 2.8 or a n average of 3609 metres square (2 storeys)
- Parking requirements:
  Retail = 4/100m
  Entertainment = 2/100m
  Residential = 1/10m
  Parking ratio of 2.3 bays/100m
  Parking: 83 parking bays maximum.
- Landscaped and paved areas: 440m

Urban Design Guidelines:

These following guidelines are aimed at creating a cohesive character for the area that builds on the existing and provides opportunity for the creation of active street levels that make pedestrians feel comfortable and safe. Developments are required to define the public space by establishing a facade line of the buildings directly along the boundaries of the public space.

The developments are required to be of a courtyard nature with and active public edge externally on ground floor level) and an internal private world. Vehicular access are limited to as little penetration of the public space as possible. This arrangement of access ensures the pedestrian priority in the public space.

There will be fixed facade lines abutting the street edges and public space. These edges must not to be impermeable and hard, but must define space. The creation of linked public spaces are important. A small square is proposed in front of the Turbine Hall next to Jeppe to create an open space for people when huge functions are held in the Hall. This space flows over into the Turbine Square. Architectural accentuation is necessary on the corner of Jeppe and West. Vehicular access ti possible basement from Jeppe. Pedestrian access from Turbine Square into building and through lifts from basement.

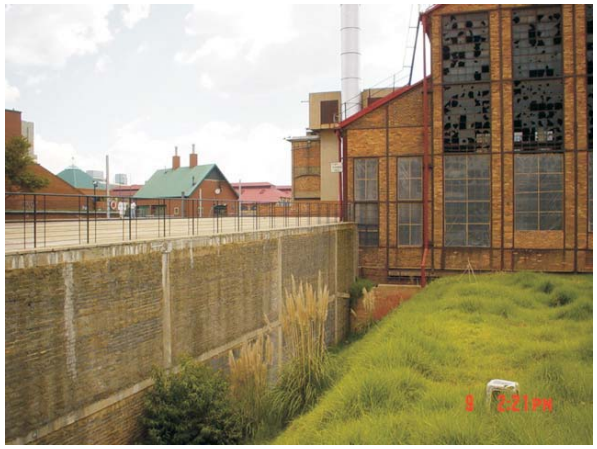


Fig 111. Pedestrian barrier.

Movement

Movement around the site is mainly car, bus and taxi orientated. Pedestrian circulation occurs along West street where the informal trading are and across the plaza to Bezuidenhout Street. A ditch prevents pedestrians to cross from the plaza to the site. This barrier will be removed in the construction of the Turbine Square. There is no access up into Kerk Street. The Kerk Street Mall is proposed for the future.

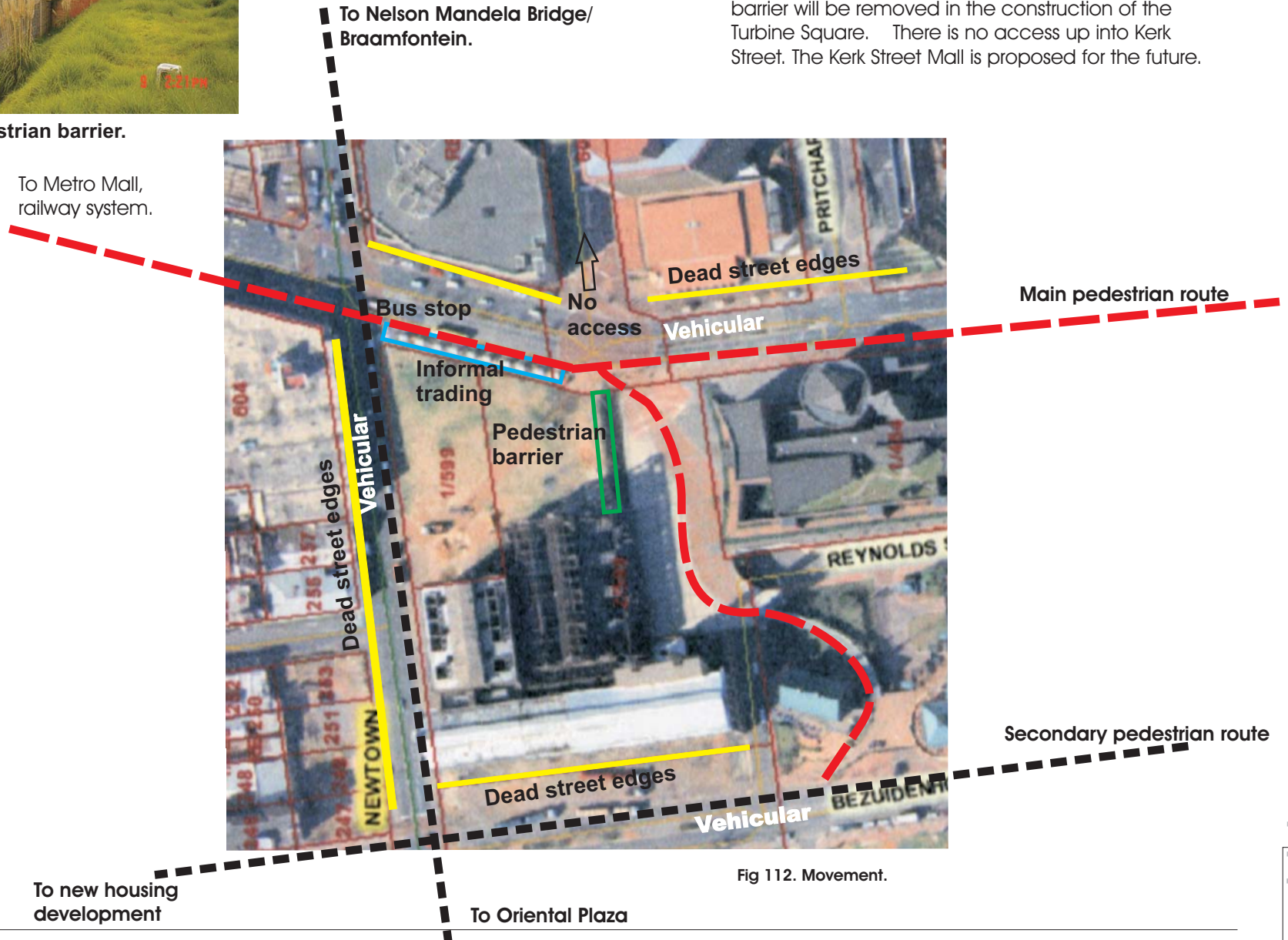


Fig 112. Movement.