

**PROPOSED VICTORIA MOTHER AND CHILD CENTRE
OF EXCELLENCE HOSPITAL ON ERF 9194, PIETERMARITZBURG:**

FLOODLINE ASSESSMENT

Erf 9194 comprises portion of the Victoria Country Club Estate, Pietermaritzburg. The site is approximately 2.45 Ha in extent and is bounded by Peter Brown Drive to the South, Ezemvelo KZN Parks to the West, and the Victoria Country Club Golf Course to the North and East.

The site is divided by a main watercourse which runs south - north through the centre of the site, and a minor watercourse passes through the northwest portion of the site, both discharging onto the VCC Golf Course, which ultimately drains to the Town Bush Stream.

The natural catchment area to the South of the site feeding these watercourses is relatively small, measuring only approximately 16.7 Ha in extent.

The natural overland flow has been altered with the construction of the N3 Freeway to the South of the site, and Peter Brown Drive adjacent to the site, the end result being that the entire catchment now drains to the central watercourse.

The minor watercourse to the West only conveys minor run-off from a small portion of Peter Brown Drive which discharges onto the site through a nominal 600mm diameter pipe.

METHODOLOGY

• **Regional and Catchment Characteristics**

The contributing catchment has been determined from available 1:10 000 Orthophotos.

The catchment comprises approximately:

- Forests and Plantations 85%
- Urbanised areas 15%

There is no scope for further urban expansion within the catchment area.

Detailed topographical survey depicting 1m contour intervals was made available for the site itself (refer attached).

- **Regional Characteristics**

The catchment is located in a region with the following characteristics:

- Drainage basin number (SDF) 25
- Mean Annual Prescription 830mm
- Regional Maximum Flood (RMF): K-factor 5,4

- **Design Flow Calculation**

Peak discharge at the point of entry to the site for a 100 year return period is calculated at $Q = 5.59\text{m}^3/\text{sec}$ (refer table below).

Erf 9194 Sub Catchment

SDF METHOD:

SUB-CATCHMENT	AREA: (ha)	AREA: (km ²)	RUN-OFF COEFF		L (m)	ELEV (m)	ELEV (m)	S _{100s} (%): DEFINED	S _{100s} (%): OVERLAND	Tc (mins): DEFINED	Tc (mins): OVERLAND	Tc (mins)
3	16 715	0.167	0.5	O	310	1075	950	12.800	40.323	3.020	5.767	8.787
				D	250	944	920					

POINT PRECIPITATION					T _r FOR RETURN PERIOD:					Q, PEAK FLOW (m ³ /s)				
5	10	20	50	100	5	10	20	50	100	5	10	20	50	100
15	20	24	31	35	103	135	167	209	240	2.40	3.13	3.37	4.85	5.59

- **Flood Line Determination**

The contributing catchment drains onto the site through a 900mm diameter pipe culvert under Peter Brown Road. This pipe culvert has a headwater depth of approximately 4.5m due to the road fill embankment under which it is laid. The maximum design capacity of the pipe under these conditions is approximately $Q = 3.5\text{m}^3/\text{sec}$ which approximates to the calculated 1: 20 year return period.

Storm flow discharge of greater return period therefore would be restricted and attenuated to some degree, before overtopping Peter Brown Road and flowing eastwards along Peter Brown Drive.

Cross sections of the watercourse have been determined from the available survey and flood line delineation using the maximum culvert capacity as highlighted above are depicted on the attached survey plan.