

BRIEF DESKTOP ASSESSMENT OF THE 1:50 AND 1:100 YEAR FLOOD FOR THE PROPOSED  
DEVELOPMENT OF PENNY LODGE WITHIN THE ZULULAND RHINO RESERVE

Catchment Information:

- Stilted camp adjacent to the Umsunduzi River within the Umkhanyakude area;
- Original simulation undertaken downstream using design rainfall for the SCS-SA, Rational and SDF methods;
- Gauged data downstream was of poor quality;
- Mean Annual Precipitation is approximately 793 mm (Station 0375124 W – Ubombo);
- Total catchment area is 484 km<sup>2</sup>;
- HEC-RAS and HEC-geoRAS have been used in nearby areas to calculate the design flood event. This was extrapolated to this site.

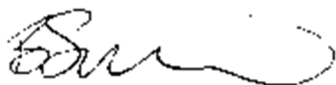
Assumptions and Limitations:

- Manning's n - values (the channels roughness coefficient) was estimated using a desktop approach.
- 5 meter contour interval data and the 30m Digital Elevation Models (DEMs) were used in the design flood estimation (development of the elevation model).
- No site visit was conducted;
- A more detailed assessment would be needed for design and safety purposes.

Results:

A design discharge of 1950 m<sup>3</sup>.s<sup>-1</sup> was determined for the 1:100 year event whereas a discharge of 1387 m<sup>3</sup>.s<sup>-1</sup> was determined for the 1:50 year event. This system is a flood driven system and often experiences no surface flow. Large events have been observed in this system as is evident by the design dimensions of the bridge where the river crosses the N2 freeway. Unfortunately none of the large events have been properly captured in the past.

Although the preliminary results show that the flood events are likely to reach the development, the risk is low as the accommodation units are elevated on stilts and the flood extent is likely to be characterised by low flowing inundation during such an event. There is risk of bank under-cutting during these events which could undermine the foundation of the structures. Given the proposed setting of the camp, this has become an area of concern as it is located on the bend where the hydraulic pressure would be the greatest in the channel.



07/04/2016

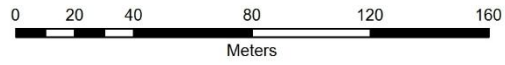
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Signature of the specialist:

Bruce Scott-Shaw – NatureStamp PTY LTD



-  Access
- Proposed Camp**
-  Arrival Area
-  Main Area
-  Single Unit
-  Dam
-  Proposed Area (5 ha)
-  1:100 Year Flood
-  1:50 Year Flood



Compiled by BC Scott-Shaw  
MAP Ref: 06.1-04-16

Date: 04/07/2016  
Scale: 1: 2 000

Coordinate System: tm vgs 31  
Projection: Transverse Mercator  
Datum: WGS 1984  
False Easting: 0.0000  
False Northing: 0.0000  
Central Meridian: 31.0000  
Scale Factor: 1.0000  
Latitude Of Origin: 0.0000  
Units: Meter

**PROPOSED PENNY LODGE  
WITHIN THE  
ZULULAND RHINO RESERVE  
ADJACENT TO THE  
UMSUNDUZI RIVER  
(PTN 13727)**

