

Portion 1 1 (of 1) of the Farm Mac Corkindales  
Grant No. 1810  
ZINKWAZI

**STORMWATER MANAGEMENT PLAN  
AND  
FOUL WATER DISPOSAL PLAN FOR NEW AND  
EXISTING CHICKEN HOUSES**

Prepared By:

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<b><u>CONTENTS</u></b>	<b><u>PAGE</u></b>
1. Introduction.....	3
2. Terms of Reference .....	3
3. Background.....	4
3.1. Nature of Soil	
3.2. Topography	
3.3. Precipitation and 1:100 Year Flood Line	
3.4. Ground-water Seepage	
3.5. Vegetation	
3.6. Development Impacts Downstream of Site	
3.7. Temporary stormwater management during construction	
4. Stormwater Management Plan Activities.....	4
4.1. Catchment and Calculation	
5. Proposed Stormwater Management System.....	6
6. Conclusion .....	7

## 1. INTRODUCTION

Stormwater management is the title used to describe a group of techniques whose common aim is the mitigation of undesirable effects produced by the quantity and quality of urban or development runoff. In any development of this nature it is necessary to control stormwater and when controls are put in place then it is essential to manage the stormwater. This report provides guidelines for the management of stormwater from commencement of construction activities through to the completion of the project as well as on-going maintenance measures which need to be implemented on a regular basis.

## 2. TERMS OF REFERENCE

Vijay Ori & Associates were appointed by the owner of Mac Corkindales Poultry Farm to compile a Stormwater Management Plan for the construction of new chicken rearing houses on the abovementioned property.

The site is currently partially developed for the purposes of a chicken rearing facility. Included in the development are four chicken rearing houses with associated buildings, staff accommodation and an existing old house.

The site was visited on 14 May 2015 and the following observations were made.

- Currently there are no attenuation facilities on site.
- Waste water is directed to a septic than on site. The septic tank does not appear to have adequate capacity.
- During rainfall stormwater mixes with the waste water and lead to an overflow of the septic tank.

This report is directed at addressing, both the stormwater and wastewater system.

## 3. BACKGROUND

In order to formulate a Stormwater Management Plan it is essential to take into consideration the following:-

- Nature of soil
- Topography
- Precipitation and 1:100 year flood line
- Groundwater seepage
- Vegetation
- Development impacts downstream of site

### 3.1 Nature of soil

No Geotechnical investigations were done at the time of writing this report. However, during the site inspection the nature of the ground was visually examined. A conclusion was formed that while the permeability of the soil

would support the discharge of domestic waste it is unlikely to cope with large volumes of waste water that would be generated by the wash down activities of the chicken rearing houses.

### 3.2 Topography and Building Platform

The site is fairly flat above the 78m contour line steepening towards the western and southern boundaries to a gradient averaging 10%. It is anticipated that 2,5m deep cut and 2,5m high fill will be generated by site levelling of the platform for the new building. Cut and fill batter slopes should be constructed to 1:1.75 batter slope. A 300mm wide half round surface channel should be installed at the base of the cut banks and sloped to the cut/fill interface. The platform should be sloped at 1:100 towards this channel. The discharge should be controlled by means of a stone pitched drain positioned to run along the contour with a 1:200 fall.

### 3.3 Precipitation and 1:100 year flood line

In accordance with Weinert chart this area falls within the wet zone with an N factor <2. This is similar to the Durban region. For this reason the stormwater guidelines developed by Ethekewini Municipality will be used for the purpose of stormwater calculations.

The 1:100 year flood line is not relevant to this site.

### 3.4 Ground-water seepage

No groundwater seepage was evident during the site visit.

### 3.5 Vegetation

Light grass covers the non-developed portions of the site and the original vegetation may be assumed to be grassland.

### 3.6 Development impacts downstream of site

The storm water will be attenuated by the use of plastic tanks (Jojo or similar) and only the overflows will be dispersed onto the site.

### 3.7 Temporary Stormwater Management during construction

Reference must be made to Drawing No 360/01. During construction and until grass has been established on the fill banks, sand bags are to be placed at the edge of the platform to prevent stormwater running down the embankment. A silt fence will need to be installed along the toe of the fill embankment to prevent soil being washed down during construction.

## 4 STORMWATER MANAGEMENT PLAN ACTIVITIES

### 4.1. Catchment and calculation

Currently some roof water is being channeled to existing Jojo tanks. The following table makes provision for the existing as well as the new development. Reference should also be made to Drawing Number 360/01. A system of tanks is proposed that would provide a dual purpose of stormwater attenuation as well as rainfall harvesting.

The total site area is 4,3268ha. The total roofed area after construction of the two new chicken rearing houses is 5237. This represents 12,8% of the total site area.

From the guidelines mentioned above an allowance of 1000 litres storage must be made for every 40m<sup>2</sup> of roofed area. A further allowance of 40% must be made for the tank to be partially filled with water prior to the rainfall event. Each chicken house has a roofed area of 340m<sup>2</sup>.

DESCRIPTION	ROOFED AREA m <sup>2</sup>	STORAGE REQUIREMENT	ADDITIONAL 40% FOR PARTIALLY FULL TANK	NUMBER OF 2200 LITRE TANKS REQUIRED
EXISTING CHICKEN HOUSE 1	340	8500 LITRES	11900 LITRES	6
EXISTING CHICKEN HOUSE 2	340	8500 LITRES	11900 LITRES	6
EXISTING CHICKEN HOUSE 3	340	8500 LITRES	11900 LITRES	6
EXISTING CHICKEN HOUSE 4	340	8500 LITRES	11900 LITRES	6
NEW CHICKEN HOUSE 1	340	8500 LITRES	11900 LITRES	6
NEW CHICKEN HOUSE 2	340	8500 LITRES	11900 LITRES	6
STAFF ACCOMMODATION	285	7125 LITRES	9975 LITRES	5
BUILDING 1	30	750 LITRES	1050 LITRES	1 X 1000 LITRE TANK
BUILDING 2	42	1050 LITRES	1470 LITRES	1
OLD HOUSE	140	3500 LITRES	4900 LITRES	2

The roofs need to be provided with gutters and down pipes leading to the tanks. All tank openings at the top are to be fitted with gauze screens to prevent the breeding of mosquitos. Just before entry into the tanks pipes should be fitted with P-traps to prevent entry via the down pipes. All down pipes are to be fitted with a "first flush" system to prevent roof debris from entering the tanks.

The tanks could be inter-connected with a piped system to convey water to suitable locations. Pumps could also be used to provide pressure for washing down of the chicken houses.

The following table contains a list of activities that need to be carried out in order for proper implementation of the Stormwater Management Plan.

<b>ACTIVITY</b>	<b>STAGE</b>	<b>RESPONSIBLE PERSON/S</b>
Development Impacts downstream of site and mitigation measures	Design	Engineer
Determination of existing stormwater infrastructure and evaluation/upgrade	Design	Engineer
Construction of stormwater attenuation facilities	Before site-works commences	Contractor
Prudent removal of vegetation	Immediately prior to earthworks	Engineer/Project Manager/Contractor
Installation of cut-off drains	Commencement of construction	Contractor
Installation of temporary stormwater facilities, scour checks, bunds	During construction	Contractor
Installation of permanent stormwater facilities	Construction	Contractor
Re-vegetation of platforms, banks and cleared areas	During construction	Contractor
Landscaping and re-vegetation	End of construction	Contractor
Maintenance of temporary stormwater facilities, scour checks, bunds	On-going during construction	Contractor
Maintenance of permanent stormwater facilities	On-going on a permanent basis	Owner

## **5. PROPOSED WASTE WATER MANAGEMENT**

- 5.1 Two 9000 litre conservancy tanks are proposed for waste water collection. One would serve the existing buildings and the other for the new chicken houses. The capacity of the tanks may be amended to suite the outflows and collection frequency. Bund walls shall be constructed to prevent stormwater from entering the waste water areas.

It must be noted that existing pipework will require to be altered in order to connect to the new conservancy tanks.

6. CONCLUSION

This Stormwater Management Plan has been compiled as a prerequisite to the Plan Approval as required by the Municipality. Should there be any significant changes to the layout or design the author must be advised so that the impacts of these changes may be evaluated.

This document must also form part of any contractual agreements with the contractor/s engaged on this project. Experience shows that sometimes contractors are negligent in conforming to the various conditions included in these documents, with disastrous consequences. Responsibility is denied, especially where the drainage contractor and building contractor are not the same firm. At the end of the day the owner is left with the problem. It is therefore prudent to make all contractors aware of the Stormwater Management Plan and sign an undertaking to conform to it. Punitive measures for non-conformance may be included by the owner/client at his discretion.

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