

# DRENNAN MAUD (PTY) LTD

GEOTECHNICAL ENGINEERS AND ENGINEERING GEOLOGISTS

(Incorporating Drennan Maud & Partners (Est.1975) and GAP Consulting)



Reg. No. 2014/038872/07

Durban Head Office  
68 Peter Mokaba Ridge, Tollgate, 4001  
P. O .Box 30464, Mayville, 4058  
T: +27 031 201 8992 F: +27 031 201 7920

info@drennanmaud.com  
www.drennanmaud.com

Margate Office  
Unit 7 Gayridge Business Park No.2  
13 Wingate Avenue, Margate, 4275  
T: +27 039 3122 588 F: 0866 0275 53

Our Ref : 32017

Your Ref :

20<sup>th</sup> September 2017

## CATCHWAY PROPERTIES (PTY) LTD

PO BOX 390  
HILLCREST  
3610  
VAT: 4600271334

**C/O: Mr Peter Gilmore**

Via email:gilmorep25@gmail.com

Dear Sir,

### PRELIMINARY GEOTECHNICAL INVESTIGATION REZONING OF PTN 4 OF LOT A STERKSPRUIT NO. 2627

#### 1. INTRODUCTION

Drennan Maud (Pty) Ltd was requested by Mr Peter Gilmore; on behalf of Catchway Properties (Pty) Ltd; to perform a preliminary geotechnical appraisal for the rezoning application of Ptn 4 of Lot A Sterkspruit No. 2627, the extent of which is shown in the attached orthophoto image DWG 32017/01. The rezoning will be to General Industrial or Light Industrial. The site is located at the end of Kelly Drive on the southeastern outskirts of the Hammarsdale Industrial area in KZN. Development of the site is anticipated to comprise cut/fill earthworks, single and multi-story Industrial Park structures and associated access roads / car parks.

The following preliminary geotechnical appraisal included the review of available existing geotechnical information ( in particular the geotechnical constraints of the near-by Keystone Industrial Park Development in which Drennan Maud are involved), and a site walkover to view geological exposures and geotechnical conditions.

## 2. SITE DESCRIPTION

The accompanying drawing 32017/01 shows the site layout and topography which comprises a convex shape gently sloping hilltop area  $\pm 5-10^\circ$ , which steepens considerably  $\pm 30-60^\circ$  progressing down to the watercourse and site boundary on all sides.

Only the gently sloping central hilltop area which slopes at less than 1 in 3 ( $18^\circ$ ) is suitable for development as the remainder of the surrounding slopes are too steep for practical cost effective development (i.e. extensive lateral support and retaining structures will be required to avoid cuts/fills chasing the existing slopes). This results in a developable area of around 30Ha of the total  $\pm 85$ Ha site. **This preliminary geotechnical appraisal thus concentrates only on the central gently sloping hilltop portion deemed suitable for development.** The steep slopes and water courses approaching the sites boundary are not deemed developable and thus not discussed below.

The site was previously a Rainbow chicken farm as evidenced by the existing structures, many of which are derelict or have been demolished leaving only foundations / floor slabs and builders rubble. Minor existing earthworks are evident in the central hilltop portions in the form of small terraced cut to fill platforms ( $\leq 3$ m high), some of which accommodate existing dwelling structures or car park / truck yards.

Vegetation is mainly in the form of grasses with some large trees approaching the high lying hilltop area. Services associated with the existing dwellings are to be expected.

## 3. SITE GEOLOGY

The site is underlain by Natal Group Sandstone bedrock as depicted in the geological map Durban 2930 and evidenced in cutting exposures on the site. Minor Dolerite intrusions are to be expected, however none were observed during the field reconnaissance. An examination of cutting exposures revealed the following general subsoil profile:

0.0 - 1.0 / 2.0m	Grey brown, orange, slightly moist to dry, loose / medium dense, medium to fine sand, Top Soil / Hillwash / Residuum with sandstone cobble to boulder sized corestones increasing in amount / size with depth.
------------------	--

---

>1.0 / 2.0m Pink / orange / yellow / brown, highly weathered to medium weathered with depth, medium to widely subvertically jointed, widely subhorizontally bedded dipping at  $< 10^\circ$ , soft rock becoming medium hard to hard rock below an estimated 2-3m depth, medium to coarse grained Sandstone bedrock.

#### 4. GEOTECHNICAL CONDITIONS

##### 4.1 Excavatability

The site is deemed excavatable by Soft excavation (After SABS 1200D) to around 2-3m depth below which Intermediate and Hard excavation (blasting) is to be expected.

##### 4.2 Site Stability

As mentioned, only the gently sloping central hilltop area which slopes at less than 1 in 3 ( $18^\circ$ ) is suitable for development as the remainder of the surrounding slopes are too steep for practical cost effective development (i.e. extensive lateral support and retaining structures will be required to avoid cuts/fills chasing the existing slopes).

Regarding the gently sloping hilltop portion, there is no on-site evidence of slope instability and slopes are generally deemed stable provided instability is not introduced during the earthworks phase. Where the site has been disturbed by earthworks ( $< 3\text{m}$  cuts / fills / dumped mounds) these minor slope batters are oversteep and deemed potentially unstable. It is recommended that all cut and fill slopes be limited to 1 in 2 for preliminary design purposes.

##### 4.3 Material Suitability

Similar material types to that encountered during earthworks for the nearby Keystone Industrial Park Development are to be expected. The upper 1 - 2m of profile comprises sandy hillwash / residuum / expected to classify as good subgrade material and class as G8-G10 type material after TRH 14 1985. The upper softer sandstone bedrock (inferred at 1-3m depth) is expected to breakdown during handling to suitable size and also expected to be a good subgrade material likely to classify as G7-G10 type material after TRH 14 1985.

The harder sandstone bedrock inferred at depths >2-3m (requiring blasting to excavate) is expected to result in oversized angular fragments unsuitable for engineered fill. However these materials can be used / hidden in the batter portions of fills. The above material suitability appraisal is subject to confirmation by laboratory soil testing during the detailed geotechnical investigation phase.

#### **4.4 Seepage Zones**

No permanent seepage zones are expected on the developable hilltop portion of the site. Temporary seepage zones may develop during rainfall periods in the form of perched water tables in the hillwash / residual profiles above less permeable bedrock. Volumes are not expected to be excessive and these may be dealt with symptomatically if and when they occur.

#### **4.5 On-site Sanitation**

It is assumed that all sewage water will be piped off site and hence there will be no on-site sewage disposal via septic tanks and soakpits.

#### **4.6 Problem Soil Types**

The upper loose hillwash sands overlying Natal Group Sandstone are known to have a collapse potential when wetted under load. Stormwater control and the prevention of water ponding in the vicinity of foundations is thus essential.

The upper loose sands overlying sandstone also commonly have a moderate to high compressibility, to be taken into account during the foundation design of structures. The sands are highly erodible and hence stormwater control and erosion prevention measures (i.e. grassing) are essential both during and after construction. All cut and fill embankments should be top soiled and vegetated as soon as possible following completion.

The fill portions of the recently constructed car park / truck yard platforms comprise a mixture of sands / cobbles / boulders and appear to have been bulldozed into place with no evidence of fill engineering (compaction). These loose fill portions are anticipated to undergo self-weight fill settlement and be compressible on structure loading. It is hence recommended that these localized fills be re-engineered (i.e excavated and compacted) during the proposed earthworks development.

#### 4.7 Anticipated Founding

The structure types are anticipated to vary from lightly loaded to heavily loaded warehouse / industrial type structures. In light of the sloping ground requiring a cut to fill platform, and the presence of potentially collapsible and compressible soil types, the foundation type will vary from:

- Cut portions - structures founded on deep pad footings or deep reinforced strip footings in soils (taken down to bedrock for heavier structures), to
- Fill portions - structures founded on rafts or reinforced ground beams supported on CFA end bearing piles socketed into competent sandstone bedrock, especially for heavier structures.

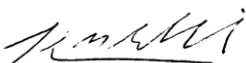
#### 5. CONCLUSION

The site is deemed geotechnically suitable for the proposed Industrial rezoning development provided the geotechnical recommendations outlined in this preliminary report and subsequent detailed geotechnical reports are adhered to.

Only the gently sloping central hilltop area is suitable for development which results in a developable area of around 30Ha of the total  $\pm 85$ Ha site. The presence of hard shallow sandstone bedrock estimated to require expensive blasting below 2-3m depth (and produce oversized unsuitable fill material) must be taken into account in the preliminary earthworks layout for cost effective design. The existing localised car park / truck yard fills should also be re-engineered (i.e excavated and compacted) during the proposed earthworks development.

A detailed site specific geotechnical investigation is recommended for each platform / structure to confirm subsoil conditions and obtain geotechnical design parameters for earthworks and structure founding.

Yours faithfully  
**DRENNAN MAUD (PTY) LTD**



**K. RIBBINK Pr.Sci.Nat.**  
Encls. :DWG 32017/01