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**Council for Geoscience
Applied Geoscience Solutions**

Our Reference: F3156.2
Erasmus Park Township Development
Your Reference: V16/099-5324
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Tshwane Metropolitan Municipality
Department Roads and Stormwater: Geology Section
Centurion Offices
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**Attention: Deputy Director: Geological and Geotechnical Engineering Management
Mrs. Ashika Sudu**

By Email: ashikas@tshwane.gov.za

**The Deputy Manager: Regional Spatial Planning
Mrs. Pat de Vos**

By Email: patdv@tshwane.gov.za

Dear Madame,

PROPOSED ERASMUS PARK TOWNSHIP DEVELOPMENT: PRETORIA

The firm, Verdicon Consulting Engineers (Pty) Ltd (VCE) submitted their report: "Erasmus Park Township Development, Pretoria: Supplementary Dolomite Stability Assessment across Zone 2", dated January 2017 to this office on behalf of their client, Atterbury Property Fund Managers (Pty) Ltd, for comments on 13 February 2017. This office acts as an agent to state authorities in reviewing dolomite stability investigations on their behalf.

A previous geotechnical investigation was conducted on site by Knight Hall Hendry in 1991 and a dolomite stability investigation was previously conducted by Dr BH Relly in 1973 & 1974 during which a total of 11 boreholes were drilled. Four of these were used during the assessment and zonation of current study area. VCE also conducted an investigation on this site in 2016 and this office provided a letter of comments, CGS Ref. F3156.1 dated 09 September 2016. In that letter this office indicated no objection to the proposed establishment of mixed township development.

The current study is a supplementary dolomite stability investigation conducted specifically across Zone 2 area. The overall Erasmus Park site covers approximately 57.66 ha land and is currently undeveloped. It is bounded by N1 Highway to the east, Leisure Bay Residential Estate to the south, Bayside Road and Van Reyneveld Avenue to the west and Solomon Mahlangu Drive to the north.

The following is noted from the VCE report:

- 1) According to the published 1:50 000 geological map, sheet 2528CC Lyttelton, the site is underlain by shale locally with conglomerate, breccia and quartzite belonging to the Rooihogte Formation of the Pretoria Group, Transvaal Supergroup. These rocks have been intruded by dolerite/ syenite as revealed by boreholes drilled on site.

The boundary between the shale of the Rooihogte Formation and chert rubble belonging to the Malmani Subgroup is located to the west of the site.

- 2) Slight groundwater seepage was encountered during the previous investigation only in TP11 and TP21 at a depth between 1.3 m and 2.25 m. No groundwater was encountered in any of the test pits excavated during current investigation.
- 3) A total of 17 percussion boreholes were drilled during the previous investigation and only two (VBH8 & VBH9) were drilled in Zone 2. This was done in order to establish the condition of the material below ferricrete. Six additional boreholes were drilled specifically in Zone 2 during the current in accordance with the requirements of SANS 1936:2012. These 6 boreholes generally intersected.
 - Transported (colluvium) soils between surface and 2.0 m depths.
 - Hardpan ferricrete between 1.0 m and 7.0 m depth.
 - Very soft to hard rock shale and dolerite between 3.0 m and 55.0 m depths.
- 4) Based on the available information from previous and current investigation, VCE has concluded and classified Zone 2 as Non-Dolomitic.

VCE has indicated that investigations which have been carried out are of a regional or feasibility level rather than a structure specific or design level. As such, a review of available information should take place for individual structures once the final layout is known. Site specific investigations may be required for heavily loaded structures.

- 5) It is understood that the proposed new township development will comprise a mixed use development with structures ranging from single to multi-story buildings and from residential to commercial use.

This office would like to comments as follows

- a) We are broadly in agreement with the assessment and classification of the entire site. VCE has divided the site into three zones, namely:
 - Zone 1: Non-dolomitic and this is supported.
 - Zone 2: Non-dolomitic and this is supported.
 - Zone 3: IHC 1/2 with a D2/D3 dolomite area designation and this is supported.

However, given that the current investigations were conducted at a feasibility level and not at a design level, when the site development layout has been finalized, a review of

all existing information should take place and then, additional study be conducted if deemed necessary in accordance with the requirements of SANS 1936:2012.

- b) VCE has indicated that the proposed land use is a mixed type development, including residential and commercial. According to Table 2 of SANS 1936-1:2012 and Table 10 of NHBRC Home Building Manual 2015 the residential developments are permissible up to **IHC 5** land and commercial developments up to **IHC 6** land, subject to footprint investigations (FPI's) and **D3** precautionary measures.
- Drilling of 23 boreholes on this 57.66 ha site is considered adequate for township establishment and therefore satisfying the minimum requirements of SANS 1936-1:2012.
 - This office confirms that the geological conditions as revealed by the existing information are considered suitable for township establishment purposes.

- c) The recommendations in Section 7 and concluding remarks in Section 8 of the report are generally supported. VCE will have to re-visit these once the site development plan has been finalized.

Therefore this office confirms support of the proposed township establishment of Erasmus Park in Pretoria, conditional to the points above and the following:

- d) No development restrictions are placed on a non-dolomitic land, i.e. in Zone 1 & 2. However, the professional team, including VCE, should verify these conditions prior to any development in these areas.
- e) A certified site development plan should be submitted to this office for co-signing.
- f) VCE has assigned a composite D2/D3 dolomite area designation for Zone 3 and therefore, this office would recommend that D3 precautionary measures be adopted for this zone. Also further drilling (FPI's) should be conducted where necessary.
- g) The development as such (residential) should be enrolled with the NHBRC and must be designed and constructed in accordance with their requirements for residential buildings on dolomite as prescribed in the NHBRC Home Building Manual of 2015.
- h) All foundations in the dolomitic areas should be suitably designed to span at least 2 m loss of support due to sinkhole or subsidence formation and these must be according to SANS 10400-H requirements.
- i) A site specific Dolomite Risk Management Plan in accordance with SANS 1936-4:2012 must be compiled and implemented where necessary. The owners/responsible persons must be made aware of the risks involved in building on dolomite, and be informed about how to be vigilant and act pro-actively by applying sound water management principles.
- j) General precautionary measures as set out in SANS 1936 Part 3: Design and construction of buildings, structures and infrastructure, must be studied and implemented for a D3 portion (Zone 3) of the site. Some precautions are listed below:
- * All stormwater from downpipes and gutters from buildings and structures shall discharge onto concrete-lined channels which, in turn, shall discharge the water at least 1,5 m away from structures onto areas permitting surface drainage away from

- buildings and structures. Joints between any open channel drains and buildings shall be suitably sealed.
- * Where guttering is not provided, impervious paved areas or apron slabs shall be provided within 3 m (or greater if deemed appropriate by the competent person (engineer)) of buildings or structures, runoff from which shall drain into lined channels feeding into a designed stormwater system or shall be spread as sheet flow. The paved areas or apron slabs shall include areas located below the drip line or the periphery of the building or structure that is subject to draining rainwater.
 - * Wet engineering services should, wherever possible, not be placed parallel to buildings unless they are at least 5 m away (if stand size allows) from the structure. Should this be unavoidable, a rational design shall be performed by the competent person (engineer).
 - * The preferred pipe type for all wet engineering services, and the sleeve systems for such services, on dolomite area designation D3 sites are polyethylene (PE) pipes and fittings that comply with the material manufacturing requirements of the relevant of parts 1, 2, 3 and 5 of SANS 4427.
 - * Liquid-retaining structures shall be watertight (zero leakage), constructed without any joints, and shall not be placed closer than 5 m from a building.
 - * The water supply to a building shall be via a single water supply connection unless otherwise approved by the competent person (engineer). This also applies to other pressurized liquid bearing services.
 - * Wet engineering services, excluding stormwater systems, shall be capable of spanning the projected nominal sinkhole diameter (2 m), which has a high likelihood of formation in accordance with the requirements of SANS 1936-2, without the service rupturing or any joint leaking or separating from the pipeline.
 - * Gardens within 15 m of buildings and structures shall not include (a) water features, such as fish ponds, except where an impermeable lining is provided in accordance with a design prepared by a competent person (engineer); or (b) water features with automatic replenishment systems. No automated irrigation systems shall be installed within a distance of 5 m from any structure or building on sites designated as D3 dolomite land.
- k) The Builder must inform the professional team when the service/foundation trenches are open for inspection takes place. The results of these inspections and quality control must be recorded in a construction report (copy to the Local Authority, NHBRC and this Office).
- l) The professional team involved, including VCE, shall carefully consider the appropriate water precautionary measures and then ensure and finally certify that these have been implemented.
- m) Wet services should be laid exactly where indicated on the drawings presented to the Local Authority, and to this Office. Wet service may not be laid below structures. The Builder or his appointed professional team should certify that they have been placed as indicated. The Home Owner must also have a copy of the exact plan presented to this Office.
- n) The Local Authority must implement a risk management system. Commenting on the suitability of sites within its jurisdiction is based on the premise that this system will be implemented.

This letter reflects the Council for Geoscience's view and approach to development on dolomite at this time, as reflected by the above date. These comments may not be viewed as open-ended. If a property changes ownership or land-use changes are made, the comment may in part or wholly no longer apply. This Office should be informed of such changes and the Competent Person responsible for the dolomite stability investigation should be given the opportunity to indicate the influence such changes could have on the overall stability.

If you have any further queries, please do not hesitate to contact this office.

Yours faithfully,



S NGUBELANGA
Engineering Geologist
For Dr. S Foya



Erasmus Park Township Development (F3156.2)

CC: Verdicon Consulting Engineers (Pty) Ltd

Attention: Ms. H Davis,

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