DEPARTMENT OF ARTS, CULTURE AND CONSERVATION

TAUNG SKULL HERITAGE SITE: MAIN COMPLEX AND TUMENG FALLS: ROADS WATER AND SANITATION

PRELIMINARY REPORT

25 JANUARY 2014

Submitted by:

ILISO Consulting (Pty) Ltd

1. INTRODUCTION

The North West Province Department of Agriculture, Conservation and the Environment wishes to upgrade certain aspects of the Taung Skull Heritage Site to more clearly reflect the very significant historical nature of the precinct. The site is situated near Norlim, and comprises a now disused limestone quarry. It is in these limestone deposits that the Taung Skull was discovered.

The site has, in some areas been upgraded, but other areas have been neglected. Some of these areas of neglect are to be addressed through the works of this project. The works discussed here are access to the site from the disused mine administration level and the works required to provide access to and ablution facilities at the Tumeng Tufa-Falls.

The intention of this report is to provide the options for discussion with the Heritage Authorities and to eliminate those options which are not acceptable to the Authorities. The acceptable options will be taken to detailed design and tender.

2 Main Access to Site

The main access route to the heritage and picnic areas of the site passes near the current museum and SMME workshop and dormitory area. The road has been upgraded using natural crushed limestone as the layers. This road ignores, however, all the heritage areas and buildings that relate to the mine loading and processing operations. As part of this Project it is intended to rehabilitate some of those administration buildings and to utilise them as a site visitor's centre and entrance complex. It is also the intention of the Department to ban the use of private vehicles on site. Visitors will be transported from the entrance to the picnic and heritage areas in vehicles provided by the Department. This option is intended to increase the security of the site and to minimise the damage caused by private vehicles.

Under the current project is is proposed to re-route the main access so that it first passes through the mine operations complex. This alignment and the works envisaged in this region are reflected in Figure 1, below.

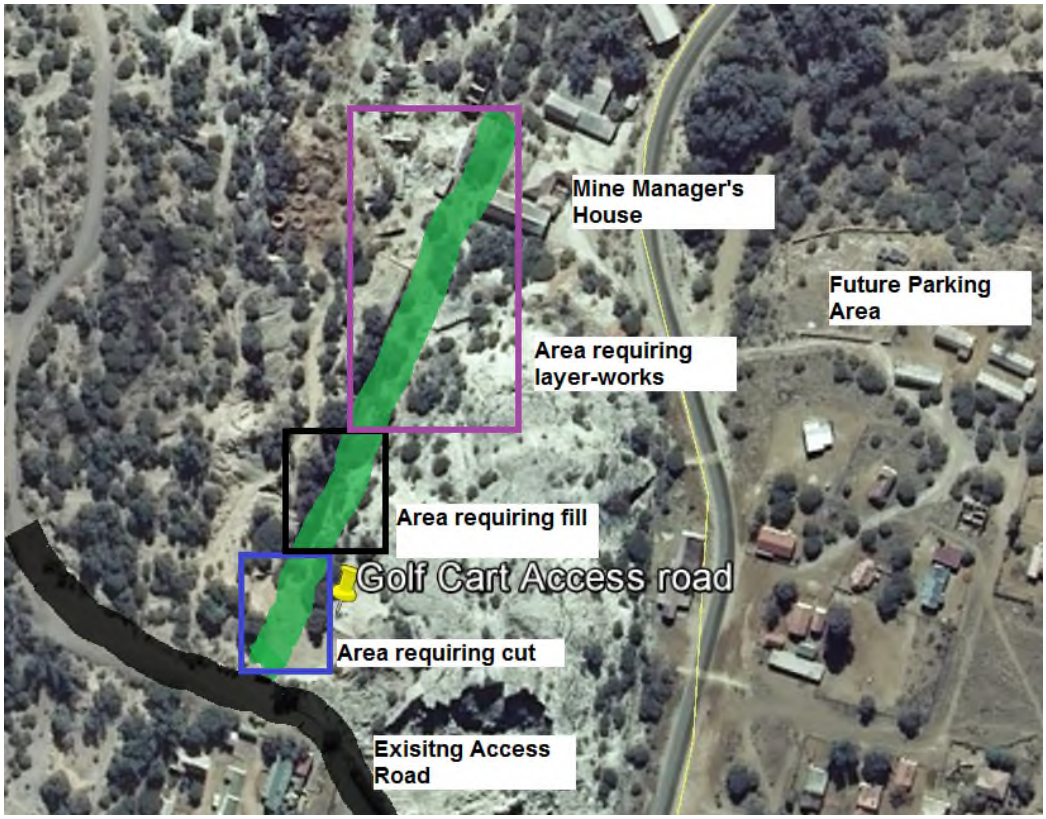


Figure 1: Envisaged Access Road Works – Main Complex

The green highlighted section of works is a disused train loading spur. The rails and sleepers have been vandalised and removed and the surrounding area has been severely disturbed. A view along the cutting is provided below.

View Looking up the Rail Cutting Towards Proposed Tie-in

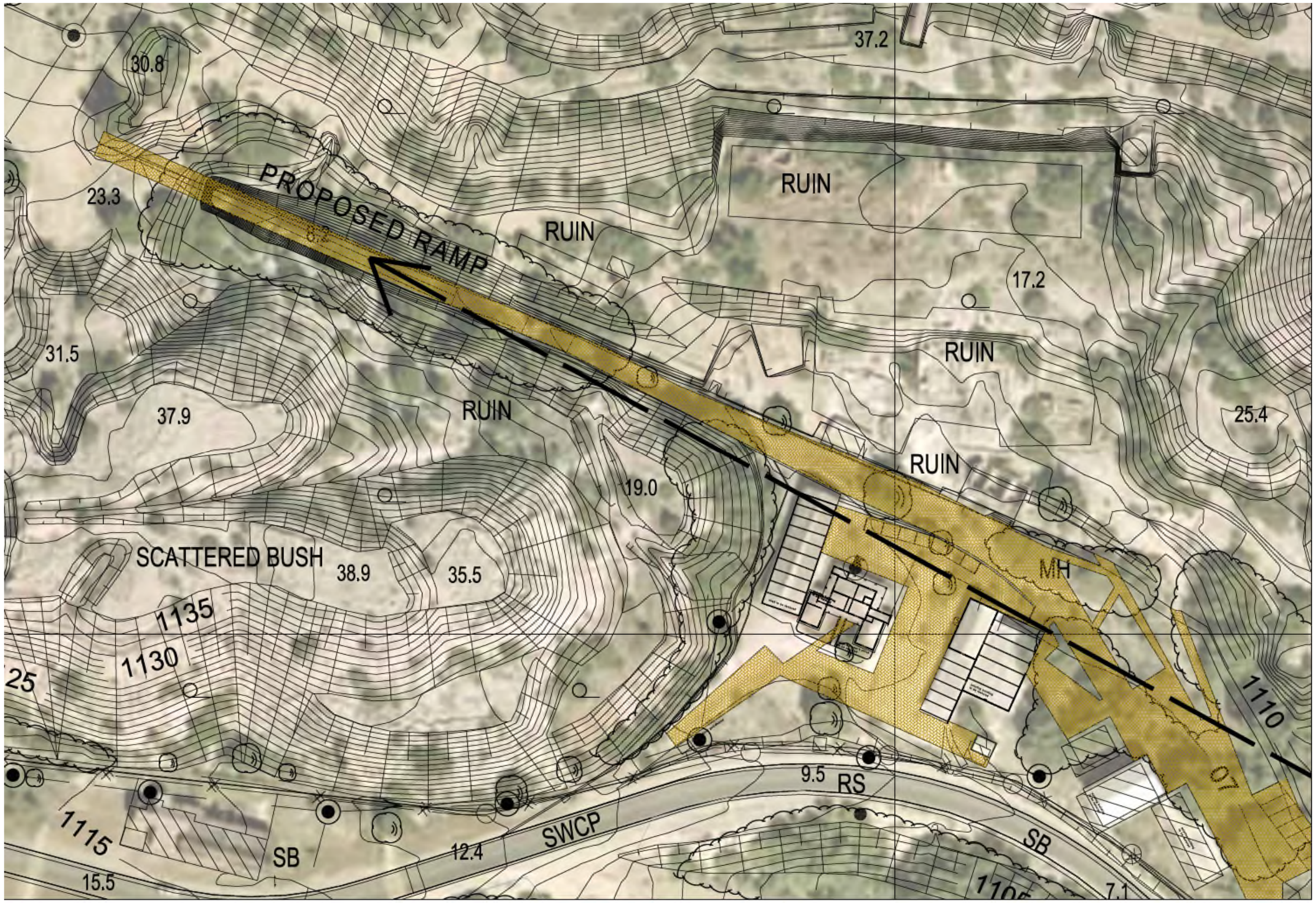
From the photograph above it is clear that the area has been severely affected by the mine activity. The optimum technical solution to use this route for access to the upper site and skull discovery area is a proposal to cut into the end of the cutting and to use the material excavated in that manner to form a ramp to the upper area. This will use the material to maximum benefit and provide both the least cost solution, as well as the solution requiring minimum maintenance. The dis-advantage of the solution is, however, that cutting and filling to provide the ramp will permanently affect the current environment.

If the option of providing an earth ramp from the lower terrace level to the upper level is unacceptable because of the permanent effect on the site, it may be possible to provide a steel ramp from the lower terrace and road area to the upper. A steel ramp of the estimated length that will be required will be (a) expensive, (b) require high maintenance and (c) be vulnerable to theft. This option is presented only to indicate that it may be possible to provide a less disruptive solution but it is not recommended.

The proposed ramp alignment is shown below. A detailed survey is required to finalise all the design aspects relating to the Works.

It is understood by the design team that the vehicles using the site roads will be of the electric golf-cart type. These vehicles will be used to transport visitors to the picnic and heritage areas. The access road and ramp design will take into account the ability of such vehicles to negotiate steep inclines. The intended use of such vehicles must, however, be confirmed, as the road design will be based on the loadings generated by these vehicles.

From the layout below, it is clear that the vehicles will be required to negotiate a difference in height of approximately 15m, from relative level 8.2 to approximately 23m, as shown on the layout below. In order to provide a slope of 1:15, a ramp that is approximately 225m long will be required. It may be possible to shorten the ramp length, thereby minimising the works required. A detailed site survey will be needed to finalise the design.



Proposed Ramp Alignment

2. Tumeng Tufa-Falls

The Tumeng falls are located some 9km south-west of the main site. These falls have a continuous flow of water and, passing over and through the limestone strata, have developed a number of attractive tufa pinnacles. The area is used, on occasion, for local religious ceremonies. Damage is occurring to the area as a result of uncontrolled access by private vehicles. In addition the Falls do not have ablution facilities and users make use of the surrounding areas, leaving unsightly waste. This project will provide regulated parking and formal ablution facilities to the Tumeng Tufa-falls.

2.1 Proposed Road Upgrade

The access road to the Tumeng Falls is shown below. The road upgrade will be approximately 9 000m in length. In order to minimise the intrusion of the proposed upgrade on the surrounding environment, it is proposed that the road will be constructed from the natural gravel of the area. It is currently uncertain as to the utilisation of the road, so a provisional road pavement has been proposed. This pavement structure will require the excavation of approximately 350mm of the in-situ material. The road-bed will then be ripped and re-compacted. The removed material will, if suitable, be replaced into the cut and compacted to a suitable standard. This replacement will take place in two layers of 150mm each. A high quality gravel will then be placed over the two lower layers, to provide a wearing course. This top layer will require maintenance to ensure a suitable quality of road. Any surplus material will be used to (a) provide the ramp at the administration complex, (b) fill a quarry area or (c) be removed form site.

The design team is in the process of investigating additives that can be injected into the top wearing course and that then act to reduce dust generation.

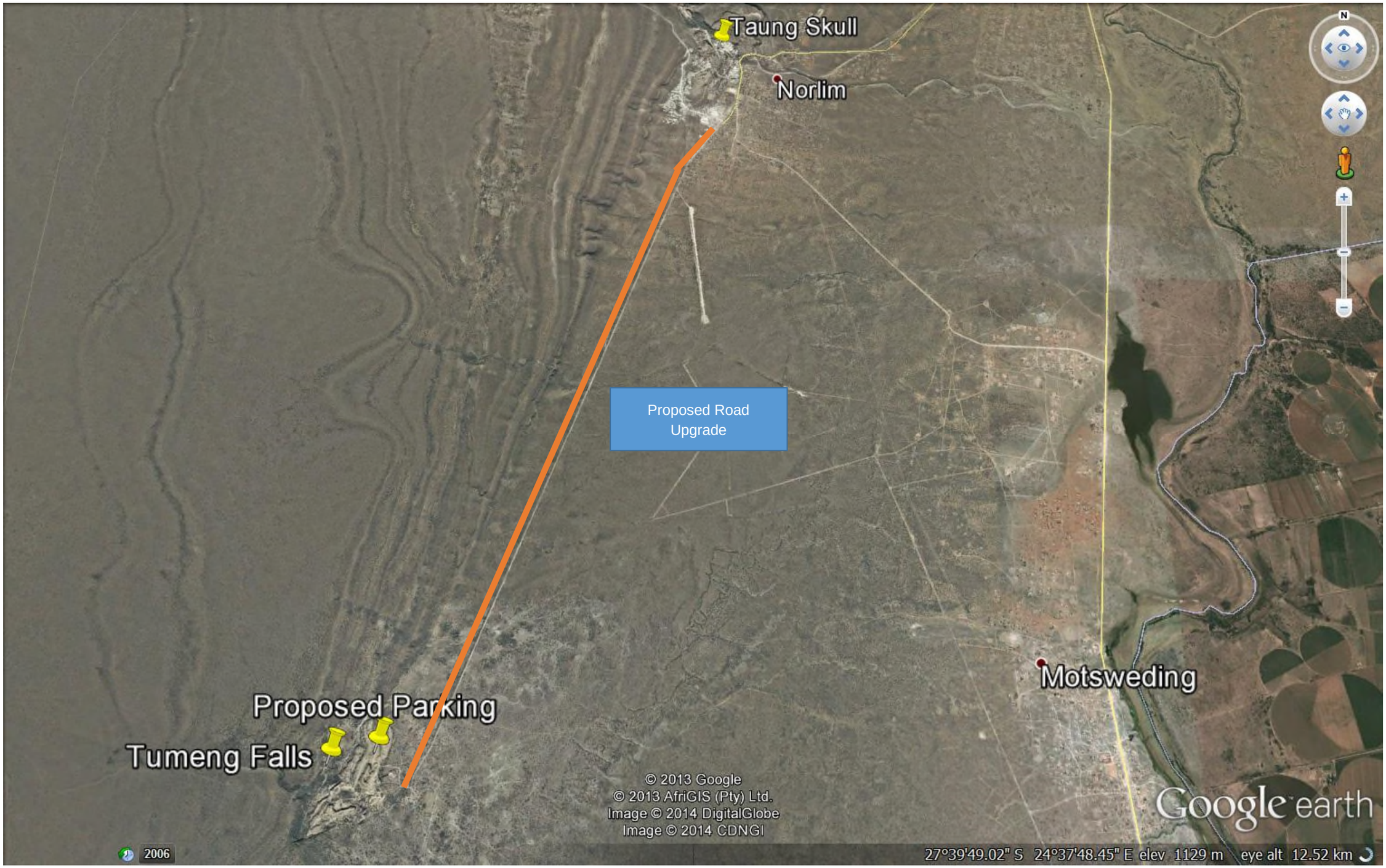
During the construction of the road, side drains and drainage culverts will be constructed and installed to ensure that any stormwater is managed and controlled to reduce damage to the road and surrounding areas.

2.2 Access Control and Parking

The Tufa-falls are currently open to the public, who drive and park where they will. This is not an ideal situation, as damage to the sensitive environment results. It is envisaged that an access control point will be constructed at the entrance to a proposed parking area. A potential area is shown below. This area is to be confirmed as acceptable by the Heritage Authorities. It is envisaged that the same layer-works will be carried out in the parking area, with local stones being set into the upper layer to demarcate the parking bays. A guard house with toilet will be provided at the entrance to the parking, ensuring compliance with the Departmental requirements.

2.3 Proposed Road Layer-Work

In order to provide a stable, economic and non-intrusive design, it is proposed that the access road and parking be constructed out of the local parent materials. The quality and acceptability of these materials needs to be confirmed, as does the expected utilisation rate of the road.



Tumeng Falls: Proposed Road Upgrade

Tumeng Falls: Proposed Parking

2.4 Ablution Facilities

The Tumeng Tufa-falls do not have ablution facilities. These will be provided in a location to be agreed with the Department and Heritage Authorities. The civil works for these facilities will consist of the water supply and waste-water disposal. These are discussed below.

2.4.1 Water Supply

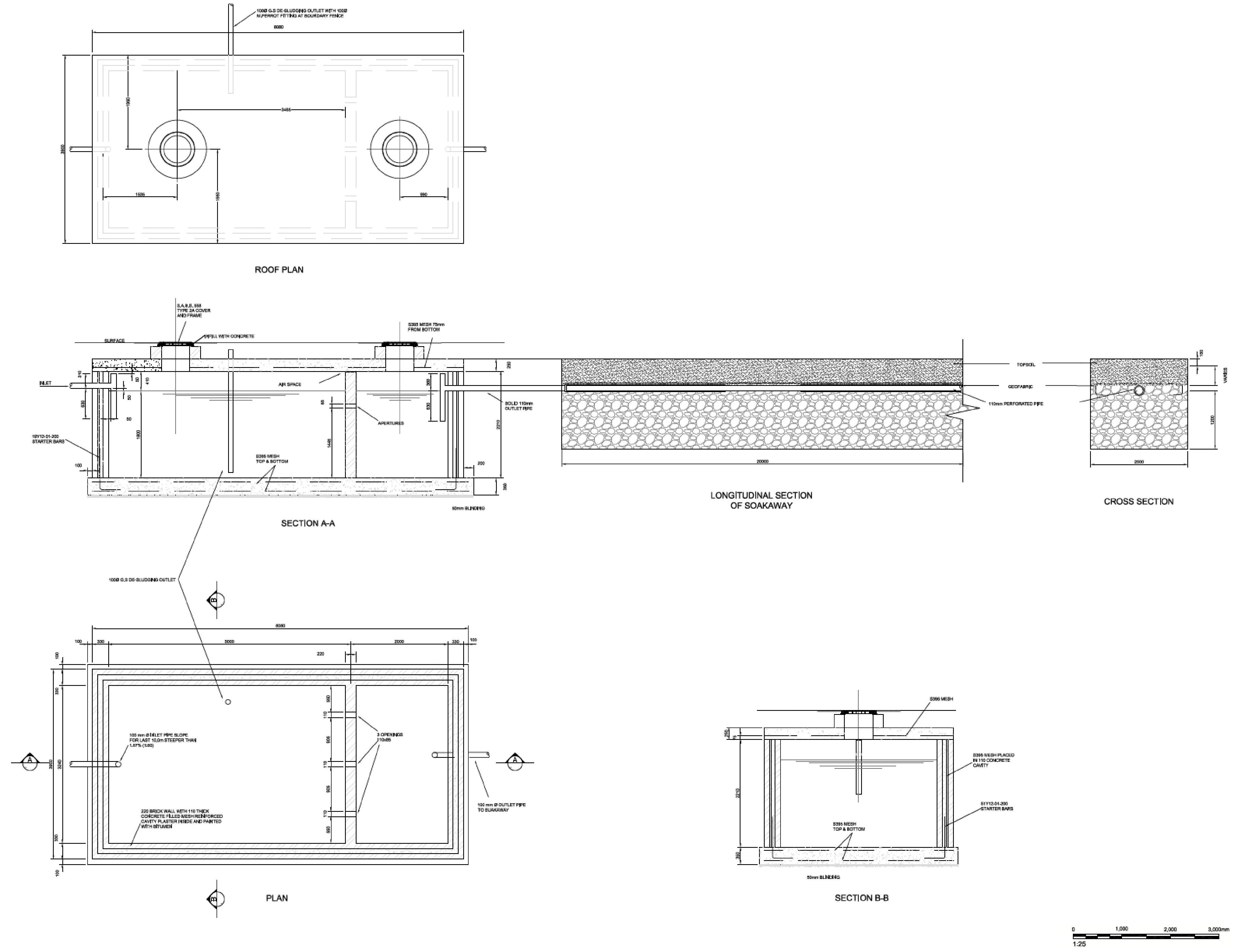
It is envisaged that the facilities will have a high utilisation only over holiday periods, primarily December. For the remainder of the year it is envisaged that utilisation of the ablution facilities will be low. In addition to the low expected utilisation, the presence and activities of local Baboons must be taken into account. To address these issues it is proposed that an elevated sectional steel tank will be provided to store water. This tank will be positioned to be as un-obtrusive as possible. The location and required pressure will be confirmed with the Design Architects once these aspects have been finalised.

It is proposed that the water supply to the storage tank will be provided by means of water drawn from a locally installed borehole. The underlying limestone strata usually provide a good source of groundwater. This has, however, to be confirmed by a specialist Geo-hydrological Engineer.

The tank will be fitted with a borehole pump, powered by portable generator. When the tank water level shows as low, the Departmental Maintenance representative will bring the generator to the site and re-fill the tanks. This will ensure that there is minimal infrastructure that can be damaged, stolen or vandalised.

2.4.2 Sanitary Wastewater Disposal

It is proposed that the ablution facilities be connected to buried septic tanks with downstream drains. These systems are known to be reliable and low maintenance. A provisional layout is given below. The tanks will be sized in accordance with the expected utilisation to give a sludge storage capacity in excess of 5 years. The only other maintenance that such systems require is a periodic inspection of the drain system to ensure that fats and other similar materials have not blocked the drainage pores.



FOR PRESENTATION

No.	DESCRIPTION / REVISION	DATE
A	FOR PRESENTATION PURPOSES	2014-01-27

COMPUTER FILE NAME

DATE / DATUM	2014-01-20	CLIENT
SCALE / SKAAL	1:25	
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CHECKED BY / NAGESIEN DEUR	RS	
DRAWN BY / GETEKEN DEUR	[illegible]	PROJECT ENGINEER
CHECKED BY / NAGESIEN DEUR	RS	
QUALITY CHECKS	CONTENT AND ACCURACY	DESIGN COMPLIANCE / PROJECT COMPLIANCE

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PROJECT

TAUNG SKULL HERITAGE PROJECT

TITLE

SEPTIC TANK
PLAN, SECTIONS & ROOF PLAN

PAPER SIZE	PROJECT NO. / DRWG. NO.	REV.
A0	1300108-08-81-C-200	A

3. Conclusion

The following is recommended for detailed design:

1. Consideration be given to providing a “cut-and-fill” ramp to access the existing site service road from the administration level to the road.
2. A three (3) layer gravel road upgrade be provided from the end of the existing tarred road to the Tumeng Tufa-Falls.
3. A parking area with access control be provided at the Falls.
4. A borehole be installed at the falls to provide water for the ablution facility and guard house.
5. The borehole be powered by a removable generator to minimise theft opportunities.
6. A septic tank and drain system be installed to safely dispose of the waste water from the ablution facility.

We trust the above is acceptable to you at this time. Should additional information or detail be required, please do not hesitate to contact the writer.

Yours faithfully

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