SOLAR PV PROJECT: ROBBEN ISLAND WORLD HERITAGE SITE

HERITAGE MONITORING REPORT
200m AC CABLE TRENCH

Conducted in terms of Section 27 of the NHRA (Act 25/1999)

SAHRA CASE NUMBER: 10232

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EXECUTIVE SUMMARY

This report describes the findings made during archaeological monitoring of earth-moving activities for the 200 m AC cable trench running from the Solar Array located at the ‘Old Cricket Ground’ on Robben Island to the electrical substation in a field across the road. The purpose of the trench is to accommodate and protect the main AC cable, which is transmitting power from the Solar Array to the minisubstation, which is connected to the main electricity arterial of the island (island network).

The study area consists of approximately 200 m of land near the edge of town on the eastern coastline of the Island. As reported in the Heritage Impact Assessment (HIA) for this proposed development (Titlestad et al 2016), no surficial heritage resources are present on this portion of land. However, it was indicated in the HIA that subsurface heritage resources may be uncovered in this area during excavations, such as buried archaeological material consisting of historical artefacts associated with the old buildings, Stone Age shell middens or stone artefacts.

The trenches for the cables were excavated with a mechanical digger, and were monitored closely for archaeological material and building foundations. In trench A, a rusty piece of metal was found; in trench B, a rusty insulated metal cable, a low brick wall structure (likely the driveway demarcation), a rusty metal pipe, a cobble stone foundation layer and an old glass Bashews cooldrink bottle were found; in trench D, two fragments of historical decorated ceramic, a large old drill bit, some sheep bone fragments, one or two rusty metal pieces and the foundations of a large structure were found. The excavation of the trenches C, E and F were archaeogically sterile.

GLOSSARY

Holocene: The geological period spanning the last approximately 10-12 000 years.
Later Stone Age: Period of the Stone Age from approximately 30 000 years ago to the present.
Middle Stone Age: Period of the Stone Age from around 200 000 to 30 000 years ago.

ABBREVIATIONS

HIA: Heritage Impact Assessment
LSA: Later Stone Age
MSA: Middle Stone Age
NHRA: National Heritage Resources Act (No. 25) of 1999
SAHRA: South African Heritage Resources Agency

CONTENTS

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Jenna is the Heritage Director at CTS Heritage and is currently completing her second Master's degree in Conservation of the Built Environment at the University of Cape Town. Jenna has extensive experience in heritage management and archaeological and palaeontological field experience.

DESCRIPTION OF STUDY AREA

The study site is located on the eastern coastline of the island, adjacent to the Robben Island Administrative Block and residential section (Figure 1). The trenches begin just north of the PV plant, bound by residential houses to the north and east, then run between the administration block and old jail, across Murray Bay Road and through a vacant field to the electrical substation. Another smaller tar road (name unknown) lies between the end of the field and the substation. The field is covered in dense ground cover and several trees (Figure 3). One long trench has been dug for the current project, divided into six portions: A, B, C, D, E and F. The ground excavated was all unused and vacant, except for a very small portion of the shelly pathway leading into the old jail building opposite the Administration Block.

Figure 1. Satellite image of cricket pitch where PV plant is now situated, indicating monitored AC cable trenches.

Figure 2. Trench B and surrounds.

Figure 3. Field in which Trench D was excavated.

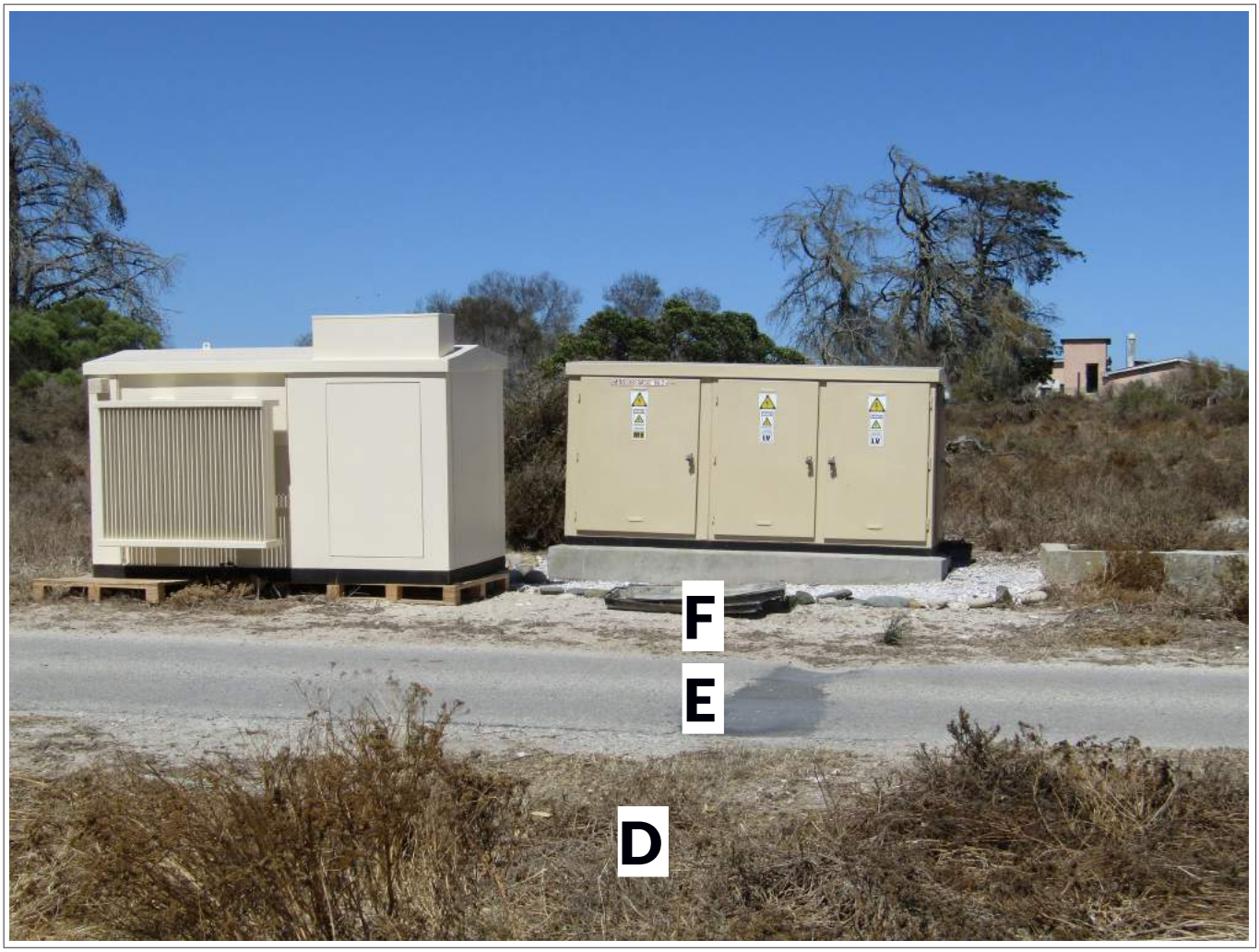

Figure 4. Position of Trenches D, E & F, unexcavated.

Figure 5. View of Trench D, looking east.

Figure 6. Excavation of Trench F.

PROJECT DESCRIPTION

The National Department of Tourism has completed the installation of land-mounted photovoltaic (PV) technology on Robben Island to improve its sustainability efforts and reduce power generation costs for the Island. The proposed facility will cover approximately 1 hectare. The site being investigated is relatively flat with limited biodiversity value. The PV plant has a generational capacity of approximately 300-500 kW. Permanent structures that have been built as part of this project include the erection of PV panels, the installation of a power line adjacent to the 1 ha site, and the erection of a boundary fence around the perimeter to keep penguins from entering the site.

This report describes the findings made during archaeological monitoring of earth-moving activities for the 200 m AC cable trench running from the Solar Array located at the 'Old Cricket Ground' on Robben Island to the electrical substation in a field across the road. The purpose of the trench is to accommodate and protect the main AC cable, which is transmitting power from the Solar Array to the minisubstation, which is connected to the main electricity arterial of the island (island network).

The AC cable itself consists of cables, each 185 mm^2 with 3 cores. It is 260 m in length. There are also 2 bare earth cables, also 185 mm^2. The main AC cable is transmitting 924 Amps at 230Volts, producing a total of roughly 637kW, which feeds into the minisubstation and subsequently the island grid. At the solar array, the AC cable terminates into a solar distribution board and into a 1000Amp breaker with 36kA fault protection. Energy goes from the solar array, through the inverters, into the solar distribution board, through the AC cable, into the minisubstation, and finally into the island network.

TERMS OF REFERENCE AND SCOPE OF THE REPORT

CTS Heritage was requested to carry out monitoring during the excavation of the AC cable trenches for the development to meet the requirements of the HIA (Appendix 4) endorsed by the South African Heritage Resources Agency (SAHRA). As Robben Island is a National Heritage Site, a permit in terms of section 27(18) of the NHRA was issued by SAHRA for this work.

The HIA found no surficial heritage resources during field work, however, the study cautioned that subsurface foundations relating to the edge of the Old Convict Station and the south ancillary structures of the male leper wards may be impacted by the development. According to a previous HIA (Hart 2001), additional archaeological sites on the Island include historical graves and possible, but sparse evidence for Stone Age (pre-colonial) sites. This monitoring brief therefore aimed to detect any evidence for buried archaeological sites and to map, record and report on the findings to SAHRA on behalf of the client.

HERITAGE LEGISLATION

The legislative frameworks that apply to Robben Island Museum (RIM) are complex. For the purposes of this assessment, the following frameworks are relevant:

Robben Island is a State owned property within the coastal zone in terms of the National Environmental Management Act (Act 109/1998) and therefore any proposed infrastructural development on the Island triggers the requirement for an Environmental Impact Assessment. The project was subject to a Basic Assessment Report (BAR) under the NEMA.

Robben Island is a declared World Heritage Site (WHS) and a National Heritage Site (NHS) in terms of the National Heritage Resources Act (NHRA) (Act 25/1999). In terms of Section 27(18) of the NHRA, no person may alter a National Heritage Site without a permit from SAHRA. As the site is formally protected, Section 38(8) of the NHRA does not apply and the applicant must obtain approval from both SAHRA, in terms of Section 27 of the NHRA, and the Department of Environmental Affairs in terms of the NEMA.

The World Heritage Convention Act (Act 49/1999) applies to World Heritage Sites and seeks to implement the agreements made during the World Heritage Convention of 1972 (WHCA) which South Africa ratified in 1997.
The general objectives of the WHCA include:

- The cultural and environmental protection and sustainable development of, and related activities within World Heritage Sites;
- To promote, manage, oversee, market and facilitate tourism and related sustainable development in connection with World Heritage Sites in accordance with local law, the

- Convention and the Operational Guidelines for the Implementation of the Convention, so as to maintain the cultural and ecological integrity of the sites;
- To ensure that the cultural and natural heritage of South Africa is protected, conserved and represented;
- To encourage investment, innovation and job creation in connection with World Heritage Sites;
- To promote the development of sustainable projects in connection with World Heritage Sites;
- To promote empowerment and advancement of historically disadvantaged people in projects related to World Heritage Sites

Robben Island was declared a World Heritage Site on the basis of criterion (iii) the buildings of Robben Island bear eloquent witness to its sombre history, and criterion (vi) Robben Island and its prison buildings symbolize the triumph of the human spirit, of freedom, and of democracy over oppression.
The island has significance in its historical, social, place, educational and environmental value (Titlestad et al 2016).

Notification of the project was formally submitted to SAHRA on SAHRIS on 21st June 2016 (Case ID 9752). SAHRA responded with the following on 16th August:

"SAHRA does not object to the trenching for low voltage cable; the electrical tie-in at mini-substation; the container placement next to the generator building and the point to point mast/post." (SAHRIS NID 368396).

METHODS

FIELDWORK

The fieldwork comprised of archaeological monitoring of the trenches excavated for the laying of AC cables after the construction of the PV plant. The site visit and monitoring took place from 6 - 8 February 2017. Archaeologists were on standby for the excavation of trenches C and E, which were not physically monitored, as they took place overnight and it was not expected that any archaeological material would be found. These trenches are located within the existing roads and required the removal of tarmac. No archaeological remains were impacted during the trenching of the roads.

Conditions and visibility were excellent. The trenches were mechanically excavated using a tractor-loader-backhoe (TLB), to a depth of approximately 800 mm and a width of 500 mm. These trenches will remain open until the cables have been laid, after which backfilling will take place. Recording of the trenches was done within a spatial grid based on 10 m portions of each of the six trenches (A, B, C, D, E and F):

- Trench A consisted of 5x 10 m portions (50 m)
- Trench B consisted of 7x 10 m portions (70 m)
- Trench C consisted of 1x 10 m portions (10 m)
- Trench D consisted of 5x 10 m portions (50 m)
- Trench E consisted of half a 10 m portion (5 m)
- Trench F consisted of half a 10 m portion (5 m)

During monitoring, the position of any new finds was recorded by means of photographs, written notes, GPS coordinates and onsite inspection of possible finds. Post-monitoring mapping of the site and finds has been conducted using QGIS software.

ASSUMPTIONS AND LIMITATIONS

No limitations were experienced during the monitoring of AC cable trenches. However, since digging took place from 7am to 6pm each day, and the archaeologist was only able to reach the ilsand using the staff ferry from 8am to 4pm each day, the archaeologist informed the site manager of likely heritage resources, and remained on standby throughout the trenching process. CTS Heritage was able to inspect any heritage resources identified during trenching, should they have been found after hours.

BACKGROUND AND CONTEXT OF ARCHAEOLOGY[1]

Robben Island has been used as a prison for rebel sailors as well as a stop-over point and refreshment station for long voyages since the 1400's. The existence of seals and penguins on the island as a source of food for passing sailors was confirmed in documented records indicating that there were thousands of seals and penguins, and also many tortoises on the Island. However, the Island's role as a source of fresh food for sailors only began in earnest in 1503 when Antonia de Saldanha and his men killed and feasted on the penguins, seals and tortoises. The source of food supplies were added to in 1601, when Sir James Lancaster started a tradition of leaving sheep on the Island "for the relief of strangers that might come thither". He left six sheep and two rams. This practice continued and in 1604 Cornelius Matelief, a Dutch Admiral, also left sheep on the Island "so that if any should come which could get no trade on the mainland, they would find something here".

In 1609 Captain William Keeling did the same. The establishment of a refreshment station at the island required dedicated people to look after the sheep and maintain the farmyard economy. In March 1654 four or five men were placed on the Island to build a shed and stay on the Island to perform these functions, heralding in human settlement.

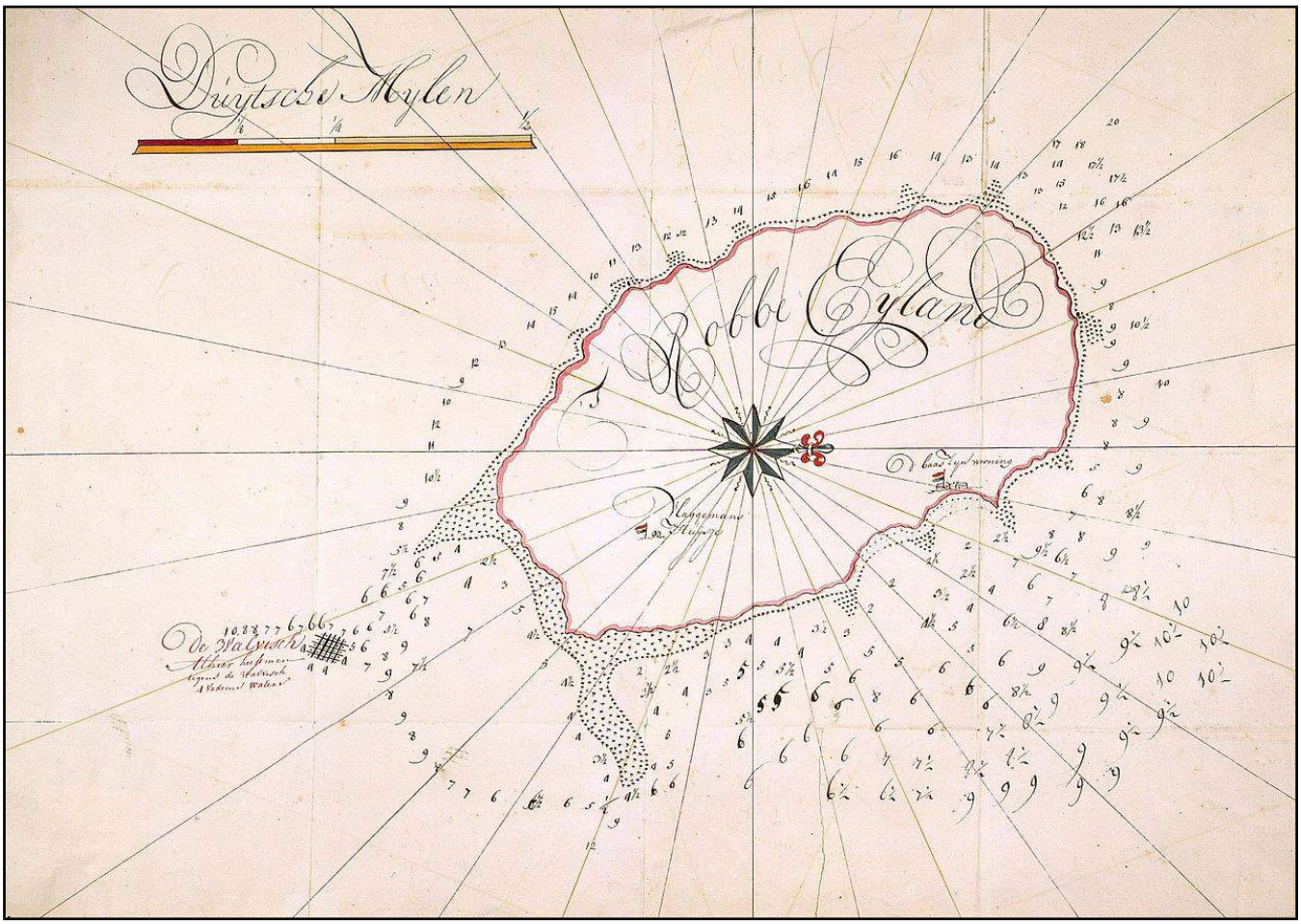

Figure 7. A Dutch map of the island from 1731 indicating minimal infrastructure.

The importance of Robben Island as a prison increased during the Dutch rule of the Cape between 1652 and 1806. During this period black and white criminals from the Cape and political prisoners from the East Indies were imprisoned on the Island. In the early days, most of

1 Adapted from the Robben Island Museum website: http://www.robben-island.org.za/

the prisoners were sentenced to hard labour on the Island and spent their days collecting shells or mining stone from the quarry. Some chopped firewood, tended the vegetable garden, looked after the sheep or slaughtered seals for the production of oil. Prisoners who were not shackled and chained were allowed the freedom to move around after hours. They were also allowed to keep private possessions and obtain liquor and tobacco. In 1712 convicts on the Island were given a monthly ration of forty pounds of rice, and they were not allowed to fish, thus preventing them from supplementing their meagre rations. These ration quotas proved to be insufficient, and unable to sustain them for an entire month and they petitioned for an increase. In 1721, the convicts who went into the veld and slaughtered the Island's sheep to supplement their food supply were punished with the suspension of their meat, rice and meal rations.

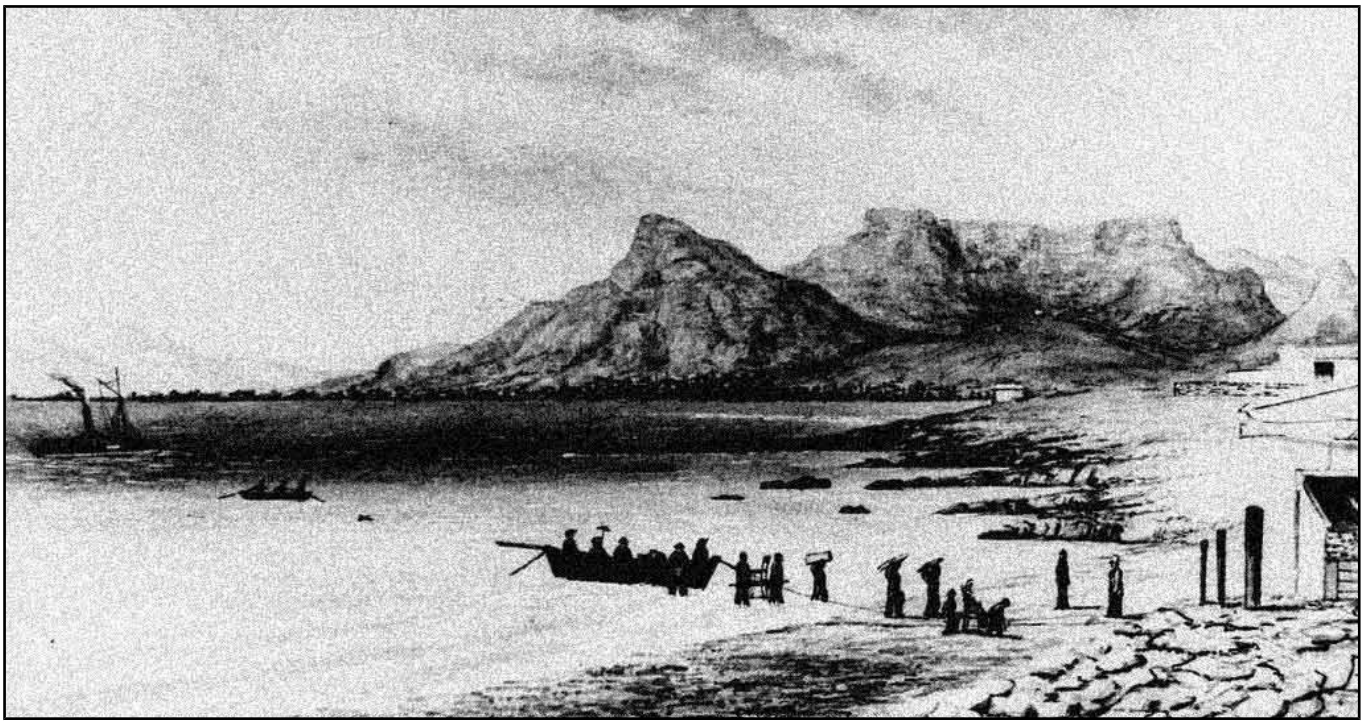

Figure 8. An image depicting an arrival to the island from Murrays Beach (c. 1600's)

By 1777, the settlement had grown to include the Postholder's house, long low buildings next to it for convicts and utility buildings such as a smithy on the right. The kramat, a muslim religious shrine, was built on the west side in honour of Prince Pangerau Chakra Deningrat of Madura who died on the Island in 1754. A new settlement was built in 1806-8 at the southern end of the Island to accommodate the British prison. By 1833 this settlement included a large house for the Commandant, soldiers barracks, oversees' houses, a bakery, butchery, smithy, workshops and prison accommodation for about 200 prisoners. A doctor's residence and parsonage were added in the early 1840s.

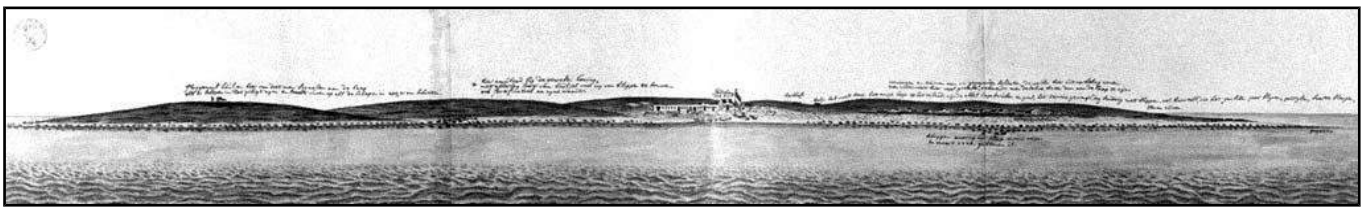

Figure 9. Panorama of Robben Island by Col. R.J. Gordon, 29 July 1777

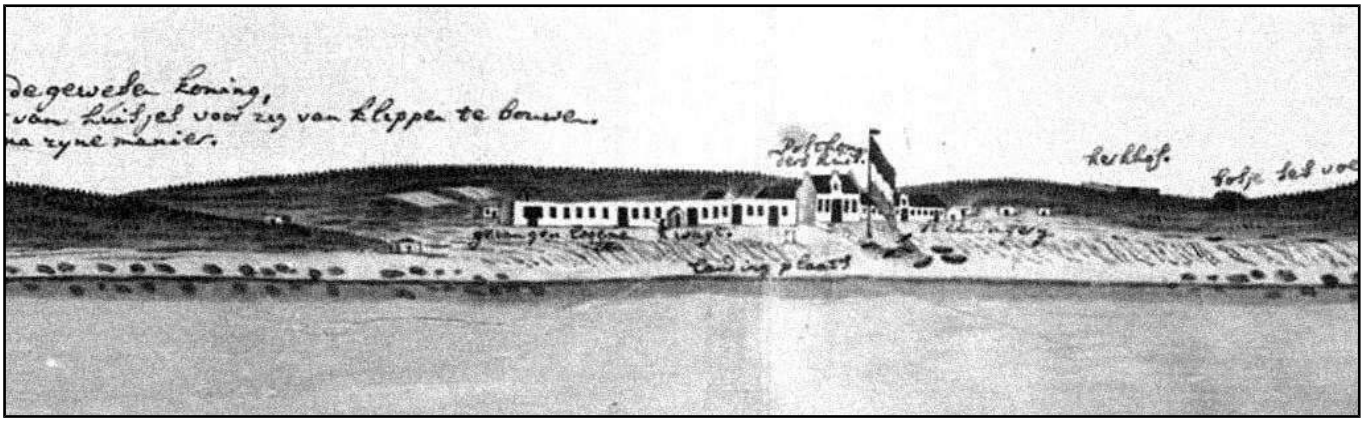

Figure 10. Close up of the Panorama of Robben Island by Col. R.J. Gordon, 29 July 1777

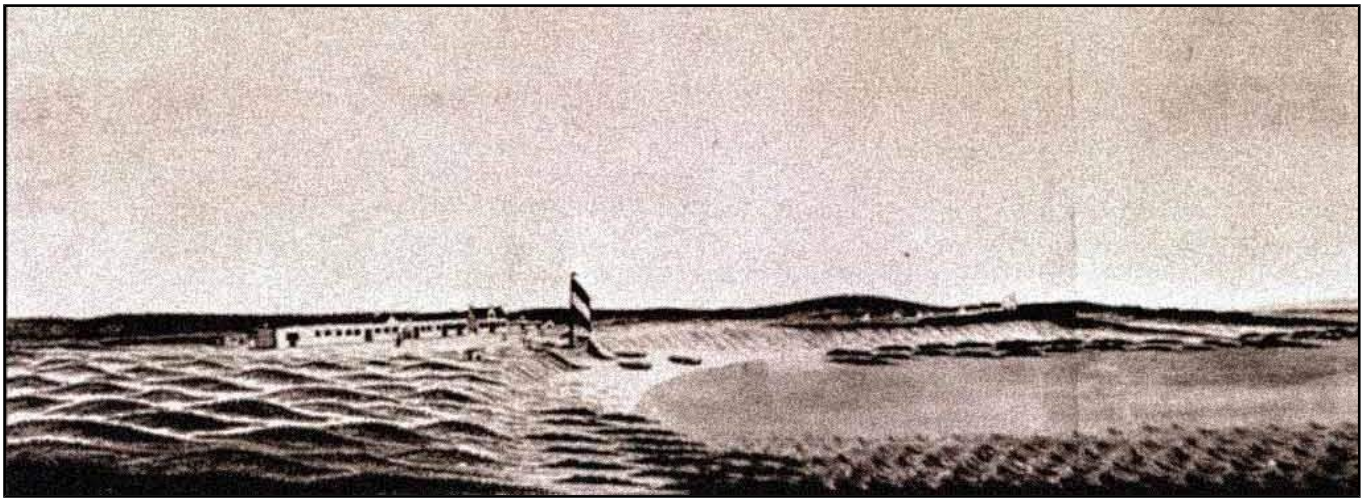

Figure 11. Colonel Robert J Gordon's impression of the Postholders house, 1977.

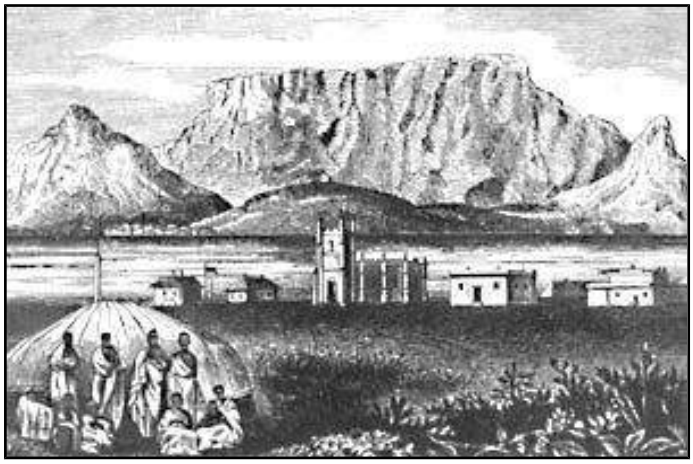

Figure 12. An image depicting an arrival to the island from Murrays Beach (c. 1600's).

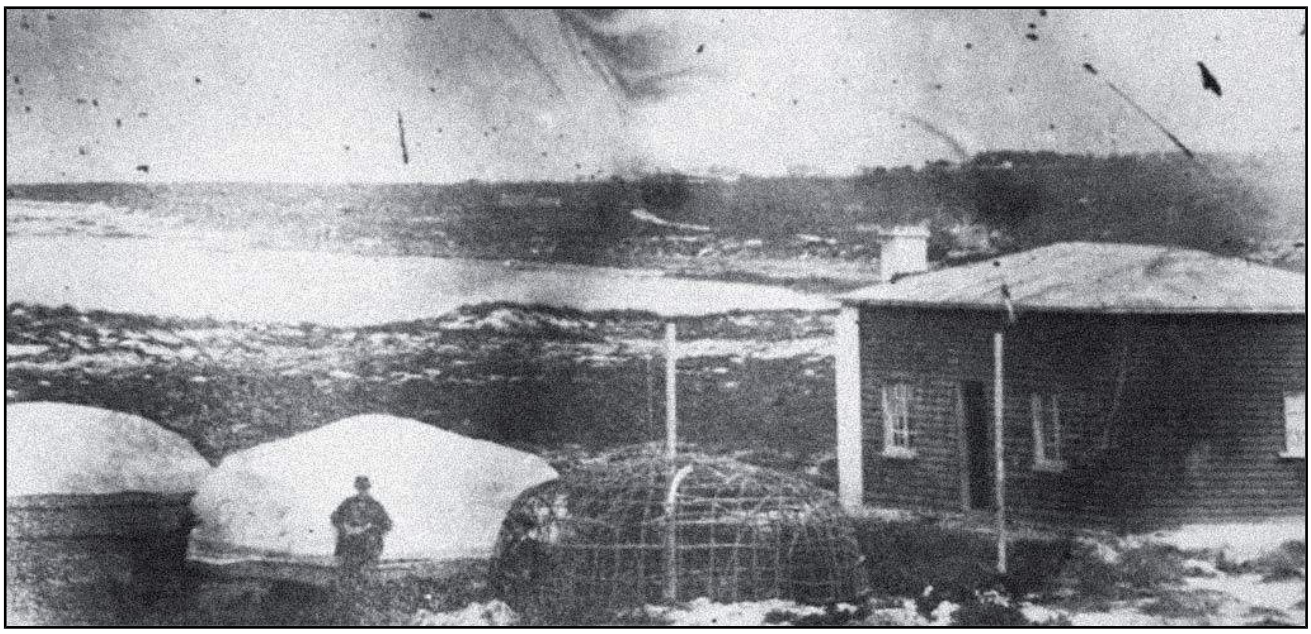

Figure 13. African chiefs who opposed Dutch and British expansion in South Africa were imprisoned on Robben Island. They served out their sentences in huts made of saplings and tarpaulin and relied on seals and sheep for sustenance.

RESULTS

Appendix 1 comprises a full description of each 10 m segment of the six trenches. Figure 18 indicates the postion of the foundations which extend into Trench D.

Trench A was excavated first and contained very little cultural material identified through the monitoring process. Sand was light-brownish grey in colour which changed only when moisture was introduced with the damage of a water pipe by the TLB in segment 20-30m. Isolated shell fragments were present but very low in number. Rubble and some beach cobbles filled the trench, and one or two old water pipes and electrical cabling, indicating that this area had been previously disturbed. A round cobble layer was present under the tree adjacent to the trench, which demarted the track leading to the cricket pitch. In segment 10-20m a piece of rusted metal was found approximately 400mm down.

Trench B was longer and the sand was much the same as in Trench A – light-brown beach sand with isolated shell fragments, tree roots and old building rubble and beach cobbles. A rusted insulated electrical cable was found in the north section of segment 10-20m. A low-lying brick walled structure was found in segment 20-30m, cutting the trench north-south; it is likely that this demarcates the driveway leading into the adjacent building. In segment 40-50m, a layer of orange-coloured round cobbles and red clay bricks, with granite slabs was found, appearing to be an old foundational layer. It was not large, but in section had a width of approximately 2 m, and was located approximately 0.7 m (from the surface) under a tar road beneath the shelly driveway. In segment 50-60, an old glass Bashews cooldrink bottle was excavated. In the remainder of Trench B, several water pipes and cables related to the drains and adjacent building to the north hindered the smooth process of excavation.

Trench C was the road-cutting, where no archaeological material was found.

Trench D was excavated in the field west of the road. This field was covered in moderate to dense ground cover and several trees, although trees were avoided during excavation. Sand was light whitish brown on the eastern side, with plant roots and animal/insect burrows visible in section. Towards the middle of the field, large rounded beach cobbles appeared, likely related to the structure found in segments 30-40m and 40-50m. Several fragments of weathered tortoise bone were scattered across the field and two pieces of sheep bone (one vertebral fragment and one rib fragment) were identified in the spoil heap in the 30 to 40m segment. Two pieces of historical decorated porcelain were found, one in segment 10-20m in the north section, another in segment 20-30m. A rusty old drill bit was also found in segment 20-30m.

The remains of a structure were found in the centre of the field, consisting of a concrete slab on the southern side, and laminar slate slabs, bricks and beach cobbles running through Trench D. This site is recorded on the South African Heritage Resources Agency with Site ID 92779 (Figure 14). Related to these foundations were ceramic water pipes, an electrical cable, and a piece of metal piping with a hole in one end. Another of these metal pipes was found further west along the trench spoil heaps. The TLB was unable to excavate some of this foundational material, and thus left a small portion, along with the piping, *in situ.* AC cables would then be laid on top of this in this particular portion.

Figure 14. Satellite image indicating the position of foundations found in the field, which extends into Trench D (Foundations = Site ID 92779).

Trench E was the second road-cutting, where no archaeological material was found.

Trench F was excavated in the small portion of field between the end of the road and the electrical substation. The area was previously disturbed with cables and other electrical infrastructure. It was very sandy, with a shelly substrate but no stratigraphy. No archaeological material was excavated.

DISCUSSION

The trenching excavations for the AC cables from the Cricket Pitch site to the electrical substation on Robben Island uncovered some interesting features and remains. The historical artefacts point to activities on the island several decades ago, mainly showing where water pipes and electrical cabling was laid to provide services to historical structures which may no longer be present on the surface. Figure 15 shows the likely location of the foundations found in Trench D, which according to this 1894 map, are remains of the demolished male leper wards.

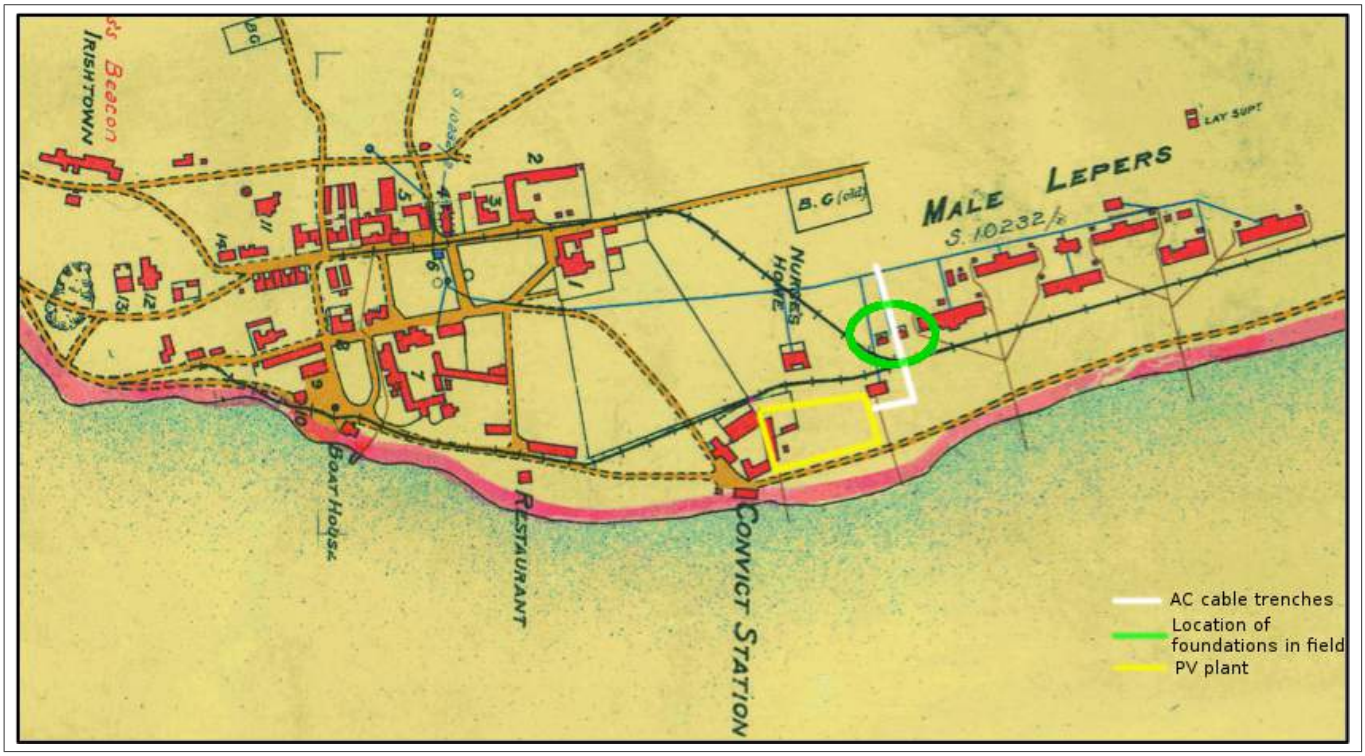

Figure 15. Extract from the Robben Island Noting sheet, circa 1894. Note the location of the old cricket pitch (now PV plant), and AC cable trenches in white. The structures circled in green are likely associated with the foundations identified through trenching activities in the field.

The discovery of the posible location of the Male Leper Wards is significant; to know that remnants of the foundations of these remain relatively intact beneath the surface, as well as the position of them adds greatly to the knowledge of Robben Island as a World Heritage Site and a National Heritage Site. Associated cultural material is rather limited, but adds insight into the history and use of the buildings. Stratigraphically, the proximity to the beach accounts for the sandy layers that make up the majority of all six trenches. Rubble was found in several parts of the trenches which speaks to the historical structures of the area and the buildings and walling located there.

CONSERVATION OF SITE

We did not find it necessary to preserve any of the materials found, as their significance is relatively low and conserving them further adds no value to the significance of Robben Island WHS. The foundations found remain in tact in the portions that were not excavated (trenches cut through foundations without demolishing the entire structure, in both cases – Trench B and D). Therefore the foundations that were cut remain on either side of the trench, maintaining and protecting their provenance.

CONCLUSIONS

Monitoring of the six trenches dug from the old Cricket Pitch (now PV plant) to the electrical substation have successfully recorded associated foundations of the old Male Leper Wards, which were cautioned against in the HIA for this project (Titlestad et al 2016), as well as archaeological material associated with historical activities in this area of the island. No monitoring was conducted for the two road-crossing trenches (Trench C and E), as it was determined that impacts to archaeological resources by the trenching activities in these sections would be unlikely. No material was found during the excavation of these two trenches.

It is therefore recommended that

- Should further trenches be required, archaeological monitoring must take place to ensure that impact to buried archaeological sites is avoided

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1. Hart, T., D. Halkett and B. Mutti, 1998. Baseline Archaeological Assessment Of Robben Island - Report Prepared for Robben Island Museum as Input to the Environmental Management Plan, Robben Island. Unpublished report.
2. Riley, P., 1993. Robben Island Conservation Survey. Cape Town: National Monuments Council. Unpublished
3. Titlestad, S., Rennie Scurr Adendorff Architects, Cedar Tower Services. 2016. Proposed Photovoltaic Cell Plant: Robben Island World Heritage Site Heritage Impact Assessment Report
4. Robben Island Museum website: http://www.robben-island.org.za/ Accessed 09/02/2017.

APPENDIX 1

Trench	Segment	Description	GPS Coordinate	Photograph
A	0-10m	NA	NA	NA
A	10-20m	Metal implement 400mm below surface	-33° 48.412 S ; 18° 22.738 E	
A	20-30m	2x metal implements 300-400mm below surface (same as previous)	-33° 48.409 S ; 18° 22.736 E	
A	30-40m	NA	NA	NA
A	40-50m	NA	NA	NA

B	0-10m	NA	NA	NA
B	10-20m	Rusty insulated metal cable protruding from north section, not in use (in image, insulation has been unwrapped).	-33° 48.402 S ; 18° 22.718 E	
B	20-30m	Concrete structure and low brick wall running north-south through trench (not archaeological) – probably driveway demarcation.	-33° 48.403 S ; 18° 22.711 E	

B	20-30m	Rusty metal water pipe running north-east to south-west.	-33° 48.403 S ; 18° 22.709 E	
B	30-40m	NA	NA	NA
B	40-50m	Cobble stone foundation layer with granite slabs <3m in length and approximately 0.7m below shelly pathway.	-33° 48.406 S ; 18° 22.700 E	

B	50-60m	Old glass Bashews cooldrink bottle.	-33° 48.407 S ; 18° 22.697 E	
C	0-10m	NA	NA	NA
D	0-10m	NA	NA	NA
D	10-20m	Fragment of decorated porcelain in north section.	-33° 48.411 S ; 18° 22.674 E	

D	20-30m	Old drill bit.	-33° 48.412 S ; 18° 22.667 E	
D	20-30m	Weathered tortoise bone and carapace.	NA	

D	30-40m	Sheep vertebra and rib from spoil heap, no evident cut-marks.	NA	
D	30-40m	Large beach cobbles with laminar slate slabs – foundations of demolished structure.	-33° 48.418 S ; 18° 22.659 E	

D	30-40m	Segment of metal piping in spoil heap	NA	
D	30-40m	Ceramic water piping beneath bush, moulded into concrete/consolidated rocks.	NA	

D	40-50m	Concrete foundations approximately 200mm below surface. A second segment of metal piping in spoil heap.	NA	
D	40-50m	Rusty metal implement (“book end”)	NA	
E	0-5m	NA	NA	NA

F	0-5m	Previously disturbed with cables and other electrical infrastructure, some shelly substrate but no stratigraphy. Very sandy.	NA