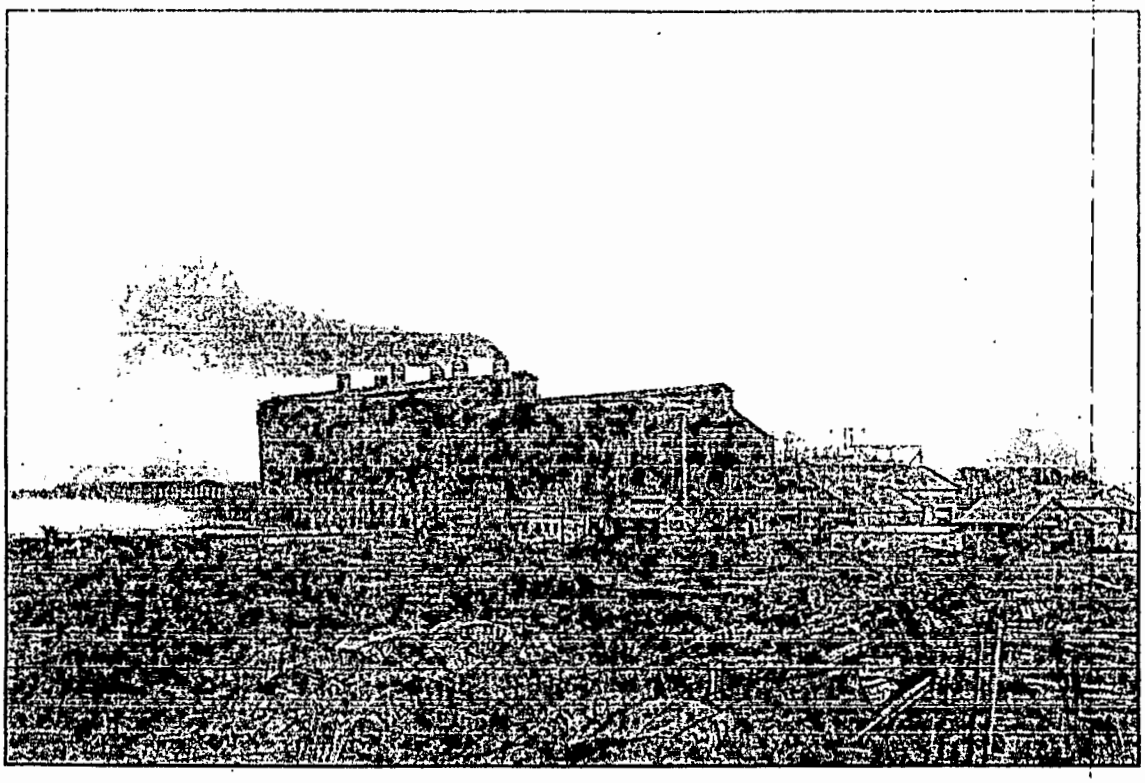
9/2/284/8F. Annx F

HERITAGE IMPACT ASSESSMENT: HISTORIC ELEMENTS AT ESKOM PARK, WITBANK



FINAL REPORT BY

CULTMATRIX CC (CK 97/46119/23)
PO Box 12013, QUEENSWOOD 0121
Fax: (012) 330-1021
Mobile: (082) 577-4741
E-Mail: cultmat@iafrica.com

September 2002

HERITAGE IMPACT ASSESSMENT: HISTORIC ELEMENTS AT ESKOM PARK, WITBANK

FINAL REPORT

SUBMITTED TO:

ESKOM HERITAGE MANAGEMENT OFFICE
MEGAWATT PARK, MAXWELL DRIVE, SUNNINGHILL

SUBMITTED BY:

CULTMATRIX CC (CK 97/46119/23)
HERITAGE MANAGEMENT CONSULTANTS
PO Box 12013, QUEENSWOOD 0121
Fax: (012) 330-1021
Mobile: (082) 577-4741
E-Mail: cultmat@iafrica.com

September 2002

FOREWORD

The Industrial Revolution profoundly modified landscapes and lifestyles. The massive means employed to extract raw materials and exploit the minerals and agricultural products resulted in great achievements and grandiose constructions, testifying to the creative genius of humankind.

Central to the Industrial Revolution was the need for and use of energy. The generation of energy in itself produced engineering masterpieces, culminating in gigantic nuclear, coal-fired and hydroelectric powerhouses designed to produce what has sometimes been called humankind's greatest and most universal servant – electricity. In this regard Eskom has played a crucial role in promoting the economic and social development of southern Africa and its numerous power stations that dominate parts of the South African landscape bear witness to this undertaking. Because of the abundance of coal the highveld of Mpumalanga is sometimes called the powerhouse of southern Africa. The first of many power stations in this region was established in the small town of Witbank in 1924. Today there are only incomplete remains of this industrial heritage site.

Rapid technological advances have rendered many industrial sites obsolete. However, industrial sites like the Witbank power station are important milestones in the history of humanity, marking humankind's dual power of destruction and creation that endangers both nuisances (like environmental pollution) and progress, Guardians of the past, these sites embody the hope of a better life.

The last thirty years have brought increased awareness of the importance of industrial history in understanding heritage. The new discipline of industrial archaeology celebrates the artefacts of the workplace and architecture that have as much meaning in our history as the religious and domestic artefacts and architecture to which more attention has been paid throughout the years. South Africa's industrial heritage includes not only mines and factories, but the social and engineering triumphs spawned by the new technologies: company towns, railways, bridges, tunnels and other forms of transportation and power engineering.

Eskom's heritage management office has undertaken pioneering work in recording, protecting and publicising this company's achievements since its inception in 1923, but has also gone much further back in history. There are not many companies in South Africa that actively promote respect for and understanding of the tangible remains of corporate achievements through an archive, museum collections, website and publications. In consultation with the provincial office of the South African Heritage Resources Agency this office saw the need to conserve what is left of the former Witbank power station within the context of the redevelopment of this site now known as Eskom Park. The 1999 National Heritage Resources Act that makes provision for heritage impact assessments to reconcile development and heritage conservation provided the legal framework for this report.

As consultants appointed by Eskom to undertake the heritage impact assessment at Eskom Park we believe that this is the first of its kind concerning a power station in South Africa. We trust that this pioneering effort will pave the way for similar heritage impact assessments for other historic power stations and other obsolete or dormant industrial sites.

Cultmatrix cc

CONTENTS

EXECUTIVE SUMMARY

The Witbank Power Station began operating from 1926 (fully commissioned in 1927) until 1970. Upon commissioning it was the largest of the ESKOM power stations and the first in the present-day Mpumalanga province. After decommissioning most of these components were eventually dismantled and demolished, leaving behind today the former residential buildings, workshops and other ancillary buildings, recreational buildings and facilities, and also a huge ash dump.

In the light of their potential heritage significance and Eskom's development proposals for the area (1998) the provincial heritage resources agency recommended a Heritage Impact Assessment (HIA) in terms of Section 38 of the National Heritage Resources Act (Act 25 of 1999).

This document is the official Heritage Impact Assessment (HIA) report as required by SAHRA in terms of the National Heritage Resources Act. The aim of the HIA is to inform and facilitate decision-making on the future conservation and use of the remaining historic buildings, sites and structures mentioned above, to ensure that the visual and other consequences of any proposed developments in the target area are understood and adequately considered in the planning process and to retain the integrity and significance of the historical buildings, sites and structures.

There are currently the following heritage resources at Eskom Park:

- Former residences for Resident Engineer and other senior employees along N 4 freeway: The first four dwellings (erected in 1925) and dwellings erected later still exist and are used for education and residential purposes. They still belong to Eskom. Watermeyer Street unfortunately cuts off this area from the rest of Eskom Park, which is a major arterial serving the south-eastern suburbs of Witbank.
- Recreation facilities: The club house is used by a security company, but the bowling green, tennis court etc are redundant
- Semi-detached dwellings: Of the original twelve, only two have survived and are in use as office accommodation by Eskom.
- Recreation Hall: This building still exists and is used by Eskom as accommodation for Industrelek.
- Housekeeper's dwelling (next to Recreation Hall): This building is used as an annexe to the hall.
- Ponds for spray-pond cooling: The foundations of these massive structures still exist. Various industrial buildings have been erected on them. One foundation is used as a helicopter pad.
- Coal-staithes, boiler house, generator house: Despite the fact that they were older than sixty years and hence were protected in terms of the National Heritage Resources Act and its predecessor (National Monuments Act), these massive structures were demolished in 1999, leaving behind grassed-over wasteland.
- Workshop buildings: The various workshop buildings, erected in and since 1925, still exist. They are in various stages of repair and are used to store Eskom archives and other materials.
- Administration office and outbuildings: Still exists and is used as office and storage.
- Ash-dump: The huge ash-dump is a major landmark.
- Compound: The remains of the original compound (west of the ash-dump) are used for storage and industrial purposes.
- Railways: A few railway tracks have remained.
- Landscaping: There are visible and impressive reminders of the original landscaping around the residential component of the former power station.

Both within a district and regional context the Witbank power station played a role of major significance:

- It encouraged major industrial and agricultural development around Witbank and in other Highveld districts.
- Although constructed and operated by the VFP, it was Escom's first large thermal power station on the Highveld.
- Although constructed and operated by the VFP, it was also the first Escom power station established after the Commission was instituted in 1923.
- For many years the Witbank power station was the largest of Escom's power stations.
- The Witbank power station is associated with the life of Bruce Marchand (1895-1972), a pioneer in the field of electricity supply in South Africa. Marchand was the power station's first Resident Engineer.

The heritage resources at Eskom Park are also important for their aesthetic (including architectural), historical, scientific/technological and social significance.

When taking the recommendations of the 1998 Master Plan into consideration, we are of the opinion that future developments will have varying degrees of impact on the heritage resources. Provided the below recommendations are followed, these impacts will in general be high but positive, since they can assist in ensuring the protection and future use of the heritage resources and can also enhance their visual quality.

We therefore recommend the following:

1. Eskom's databases (archival material such as plans, maps, photographic material) must continue to enjoy protection and maintenance as corporate policy. They are a valuable source of information on other historic power stations.
2. There is a need for specific heritage programmes, in particular the recording of oral evidence regarding several aspects of the company through an oral history programme: engineering aspects, technological innovation, scientific experimentation, construction - structural engineering and workers' histories.
3. Future development and planning must take place according to zoning, based on and in sympathy with the historic land-use patterns, special divisions and layout of the site
4. New architectural designs must be in sympathy with the architectural vocabularies in each functional zone.
5. Contemporary development needs must be combined with historic space-structure/landscape and architectural fabric based on rehabilitation guidelines as presented in this report.
6. The historic character and significance of the site must be emphasises by erecting information plaques/signage, marking of historical fabric outlines/extremities, landscape and urban design elements that would enhance legibility resulting in the possible exploitation of the site's potential as a heritage site in the Witbank urban framework and as a possible network of historical power supply facilities.
7. In terms of Section 34(1) of the National Heritage Resources Act, no structures or part of structures older than 60 years may be altered or demolished without a permit from the provincial heritage resources agency. All the affected heritage resources at Eskom Park (workshop buildings, houses, recreation facilities, offices) are definitely older than sixty years.
8. There must be short-term preservation actions or interventions aimed at identifying, stabilising, protecting and maintaining the existing heritage resources to prevent further deterioration, until actual development commences (Addendum B)
9. Actual development must be subject to rehabilitation guidelines for repairing and replacing elements of heritage resources (Addendum C).

PART 1: REPORT ON PROJECT EXECUTION

1.1 Project introduction

The Witbank Power Station began operating from 1926 (fully commissioned in 1927) until 1970. Upon commissioning it was the largest of the ESKOM power stations and the first in the present-day Mpumalanga province. This power station consisted of the standard components associated with this type of plant, namely a boiler house with boilers, steam turbines, generators, condensing plant etc, coal and ash handling plants, transformers and switchgear, filtration plant, pump house, cooling ponds, railway siding, dam and residential buildings. After decommissioning most of these components were eventually dismantled and demolished, leaving behind today the former residential buildings, workshops and other ancillary buildings, recreational buildings and facilities, and also a huge ash dump.

On 5 February 2002 Mr Francois Erasmus (SAHRA representative in Mpumalanga) inspected the remains of the Witbank power station. In the light of their potential heritage significance and Eskom's development proposals for the area (1998) he recommended a Heritage Impact Assessment (HIA) in terms of Section 38 of the National Heritage Resources Act (Act 25 of 1999).

The execution of the HIA will not only facilitate a responsible conservation decision on the protection, maintenance and management of the heritage components at Eskom Park, but will also be a first in South Africa with regard to a historic Eskom power station. It is hoped that this HIA will therefore pioneer future HIAs at other Eskom power stations and properties and promote Eskom as a major roleplayer in heritage conservation in South Africa.

1.2 Status and aim of this document

This document is the draft official Heritage Impact Assessment (HIA) report as required by SAHRA in terms of the National Heritage Resources Act.

The aim of the HIA is to inform and facilitate decision-making on the future conservation and use of the remaining historic buildings, sites and structures mentioned above, to ensure that the visual and other consequences of any proposed developments in the target area are understood and adequately considered in the planning process and to retain the integrity and significance of the historical buildings, sites and structures.

1.3 Project team

The work was undertaken by:

- Dr Robert C de Jong, Principal Member of Cultmatrix cc
- Professor Karel Bakker, Member of Cultmatrix cc
- Mr Mauritz Naudé, Associate of Cultmatrix cc

1.4 Terms of reference

Cultmatrix cc will submit a report to the client with the following information:

- A mapping of heritage resources in the target area, comprising of two components namely a) the remains of the original Witbank power station complex, and b) the portion of the ancillary historical housing component which is investigated for possible privatisation;
    - With existing mapping as a base, augment through: identifying all the resources that were part of the power station process, including social

and economic aspects - some we can just document with a single photograph, and the resources in our target area more intensely - ask the clients to as part of the project have the buildings drawn if they have not been or if the plans are lost.
    - With the Eskom site map as a base, indicate position of all resources and their relationships - representation of the complete process involved in the target area.
    - Establish whether parts of the power station are lying around in other localities, or whether similar systems still exist elsewhere.
- A brief multi-dimensional and multi-disciplinary history of the power station documented from written and visual sources, with the focus on the target area and its components under investigation;
    - Archival research, re photographs, documents and plan drawings.
    - Construct timeline that includes artefacts, events, persons, and places.
- An interpretation of relevant heritage resources in the target area and their cultural significance. For power station section draw in both Eskom and Institute of Electrical Engineers to bring in perspective with development of electricity in South Africa and abroad (e.g. possible firsts, innovations etc). For housing section use architectural and urban criteria, and relate to housing initiatives by ISCOR, Transnet and the like for interpretation.
- Cognisance of cultural issues relating to the area which may impact on the core heritage resources;
- A determination of the impact of possible development initiatives by Eskom on the heritage components of the target area;
- Speculate on how we would like to present the missing heritage resources, from where we may draw up guidelines for insertion of possible structures (buildings, roads, etc);
- Speculate on possible impact on target area seen as coherent cultural landscape that needs to be 'readable'
- Indicate compatible uses of structures and/or spaces, but also consult with client re possible uses with business and social perspective.
- Recommendations from a heritage management perspective:
    - The manner in which the significance of the target area should be conserved - including their re-use and didactic value
    - Impacts on the core heritage area that one would like to forestall
    - Impacts that one may tolerate
    - Actions required to 'save' fabric that is under threat
    - The need for further professional investigations on issues discovered during the current study
    - Design guidelines can only be established once one knows what the developments would be, but we could give broad guidelines re the housing component and the power station component that are generic.

1.5 Terms of appointment

ESKOM (represented by their Heritage Manager, Mr J McAslan) and Cultmatrix cc (represented by Dr R C de Jong) signed an agreement in Pretoria on 5 April 2002. This agreement contains the terms of appointment and the terms of reference.

1.6 Methods

Databases
Information was obtained from the Eskom archives and photograph collection housed at Megawatt Park. The Esprop office at Megawatt Park provided a copy of the 1998 Eskom

Park Master Plan. Enlargements of historic aerial photographs of the area (1943, 1976, 1991) were obtained from the Mowbray office of the Department of Land Affairs, of which the 1943 photograph yielded valuable information.

Field work

The consultants visited Eskom Park a couple of times to photograph and record the remains of the power station.

Oral evidence

Mr Norman Bladwell, an Eskom pensioner now residing in Witbank, provided important information on the power station where he was employed in 1965-1967.

1.7 Limiting factors

The most important limiting factor was:

- Lack of sufficient documented evidence regarding the design, planning and construction of the power station (no plans and elevations exist any more). This implies that some of the information had to be reconstructed, based on analogies and deductions from the existing literature, oral information, old aerial photographs and the landscape of Eskom Park.

1.8 Acknowledgements

The Cultmatrix cc team acknowledges the valued contributions made by the following persons:

- Mr Norman Bladwell of Witbank, pensioner, who possesses a wealth of oral information on the old Witbank power station.
- Mrs Elsie Jonsson, Estate Manager, Eskom Park.
- Mr John McAslan and Mrs Jenny Kolb of the Eskom heritage management office kindly loaned a number of historic photographs to the consultants and were instrumental in assisting with the accessing of new information

PART 2: MAPPING AND RECORDING OF HERITAGE RESOURCES IN THE TARGET AREA IN TERMS OF SECTION 38(3)(a) OF THE NATIONAL HERITAGE RESOURCES ACT

2.1 History of the power station

For a comprehensive history of the Witbank power station we refer to the document produced by the Eskom Heritage management office (Addendum D) as well as to this office's website and other information sources listed in this report. The below table summarises this history. **See also Figures 1 – 9 (after this page) that map the development of the site.**

YEAR	ITEM/EVENT	PRESENT STATUS
1924	The first sod is turned and construction work begins	
1925	The VFP applies to the Electricity Control Board for a licence to build and operate a power station at Witbank	

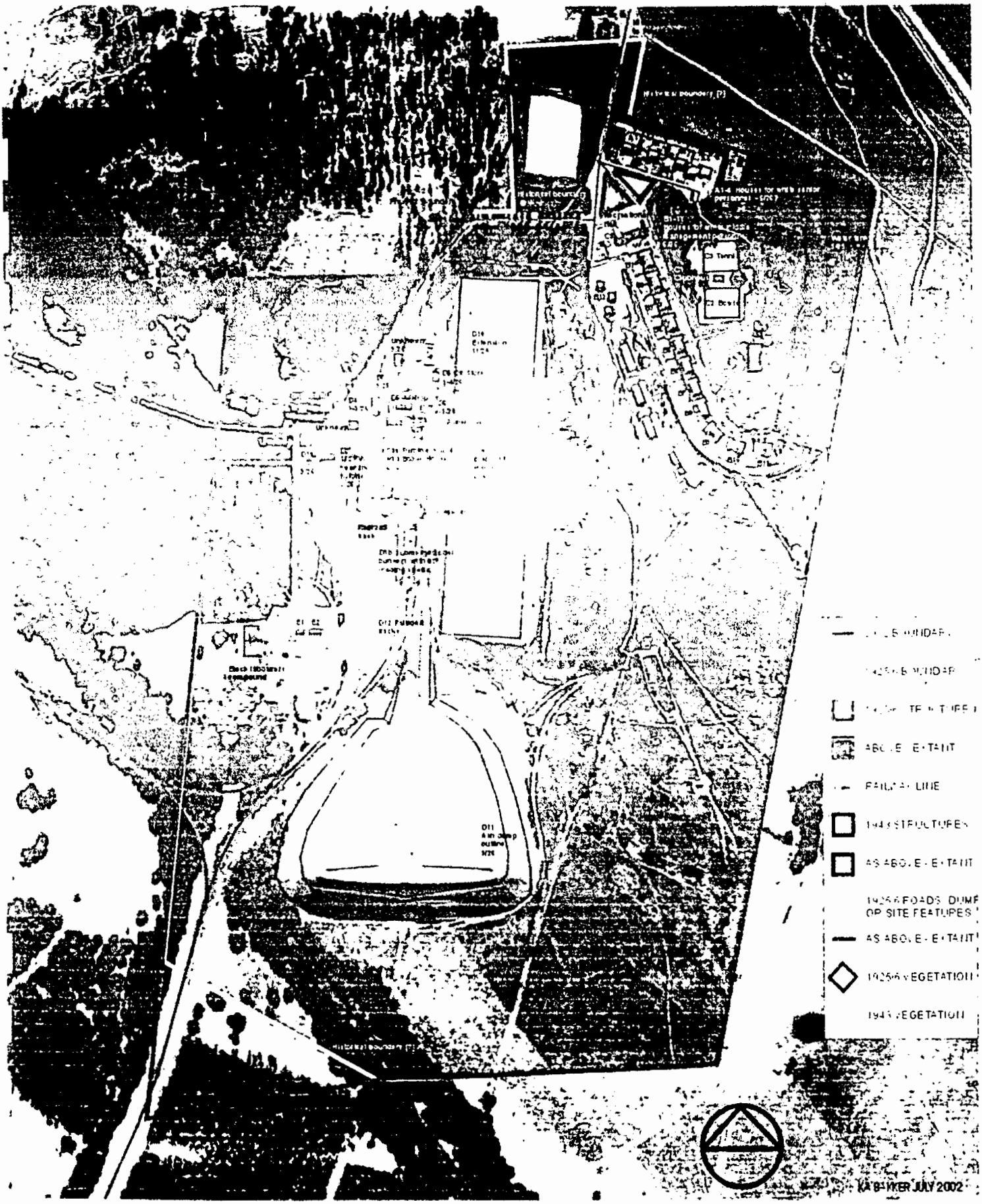


Figure 1 Site analysis 1925-8 fabric extrapolated from historical photographs (Base photograph 1943).

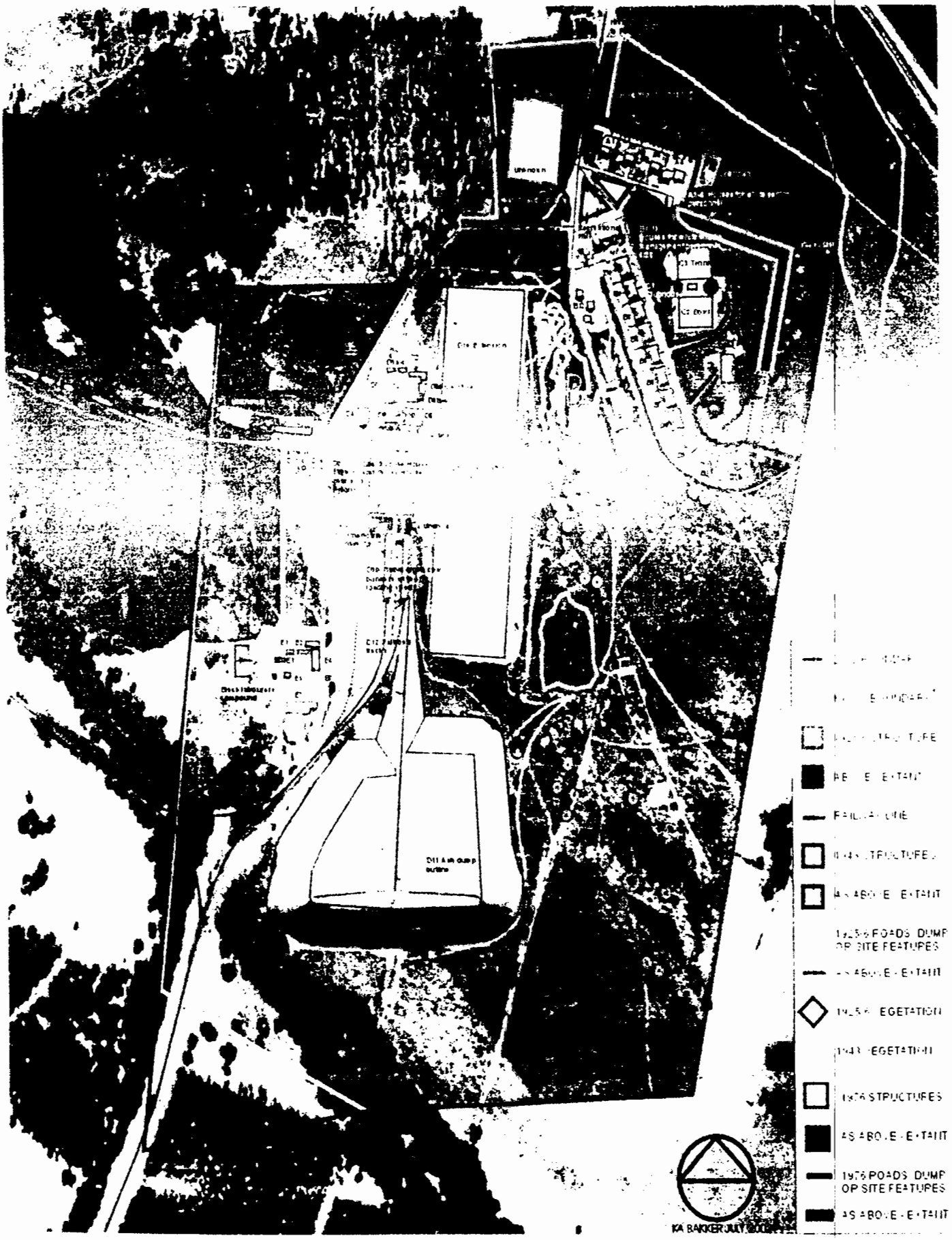


Fig 2 Site analysis 1943 fabric (Base photograph 1943).

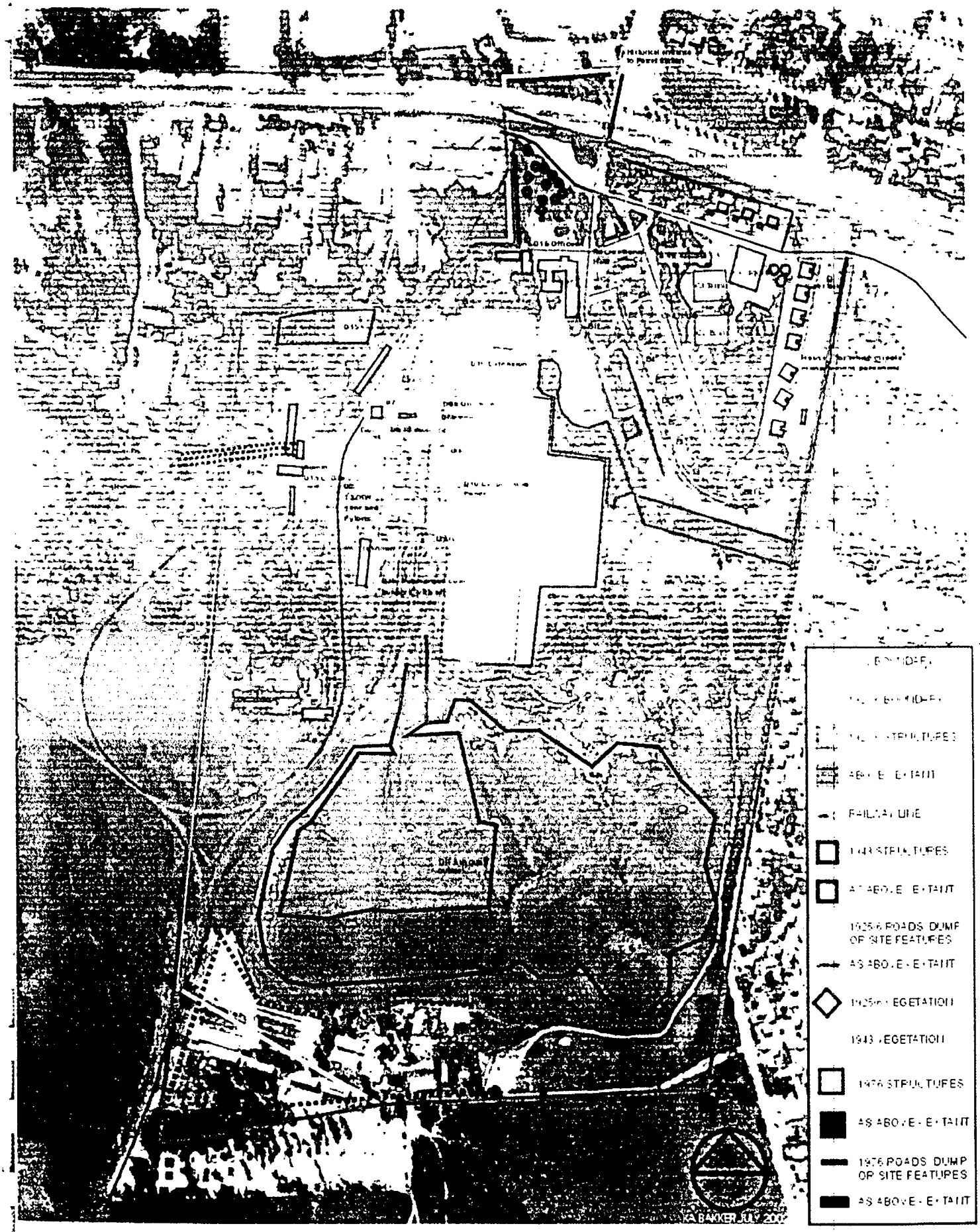


Fig 3 Site analysis 1976 fabric (Base photograph 1976).

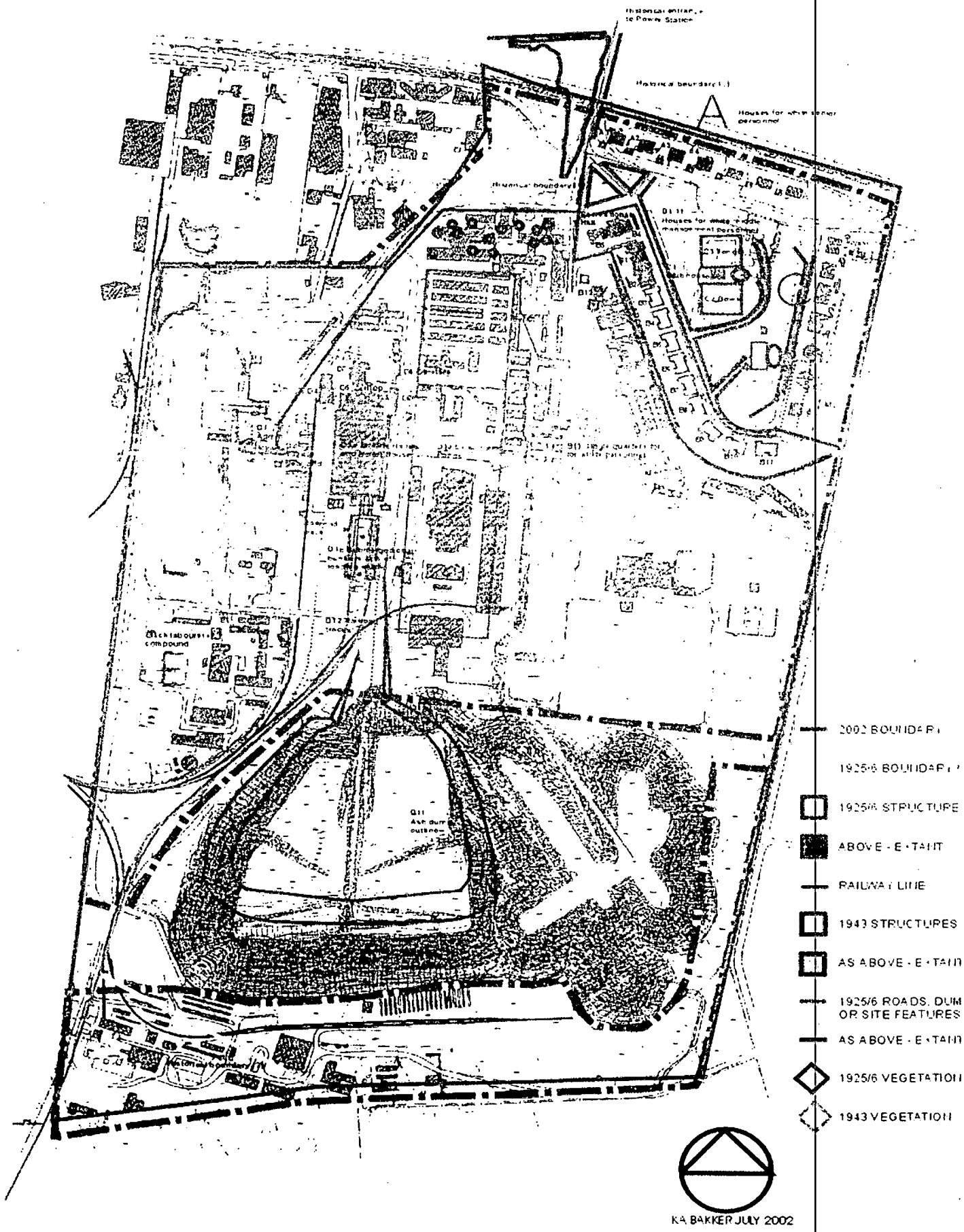


Figure 4 Site analysis 1925-8 fabric super-positioned on 2000 ESPROP Master Plan (ESKOM, 2000, fig.2)

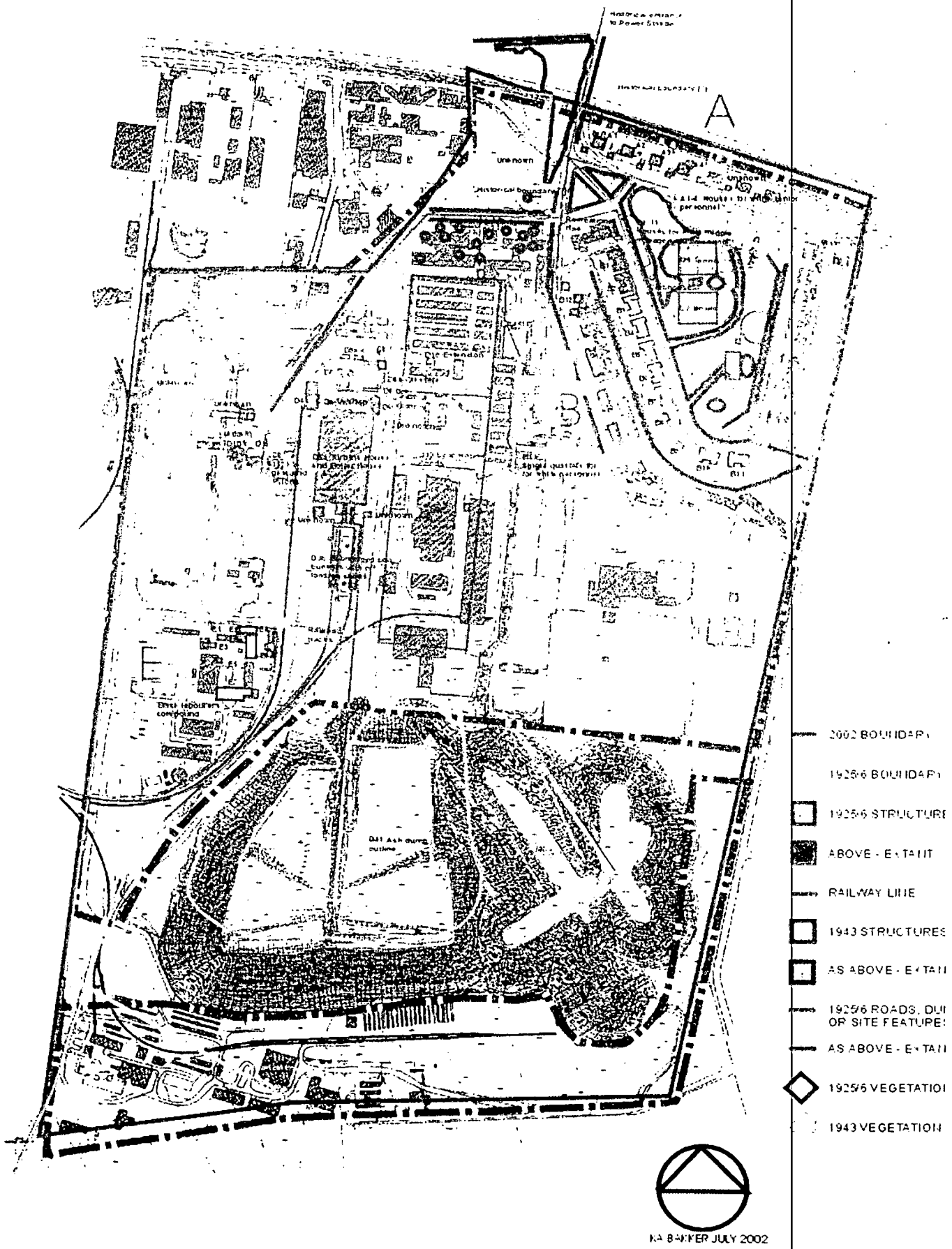


Figure 5 Site analysis 1943 fabric super-positioned on 2000 ESPROP Master Plan (ESKOM, 2000, fig.2)

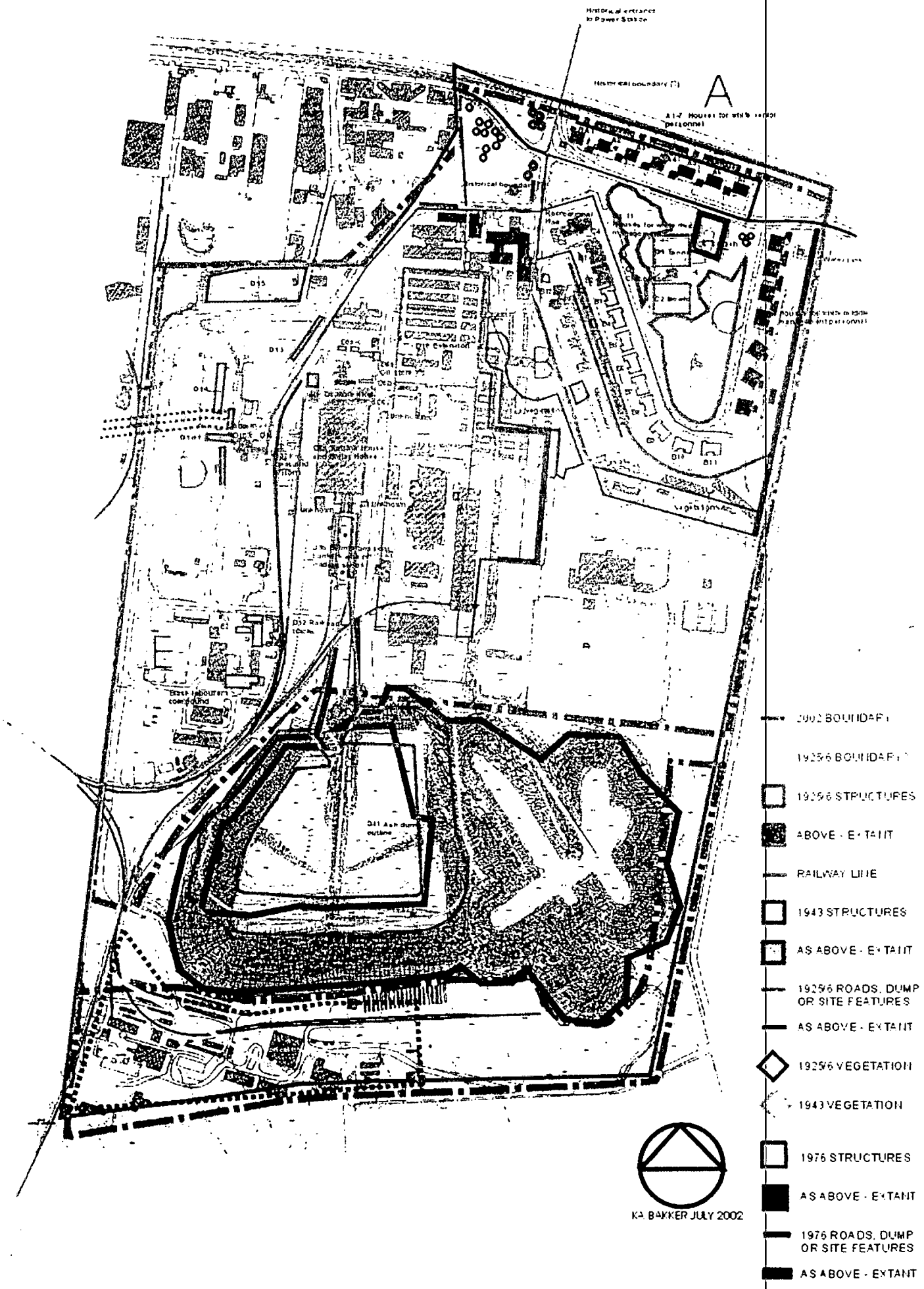


Figure 6 Site analysis 1976 fabric super-positioned on 2000 ESPROP Master Plan (ESKOM, 2000, fig.2)

Figure 7 Relationship between Power Station and resources in 1943.

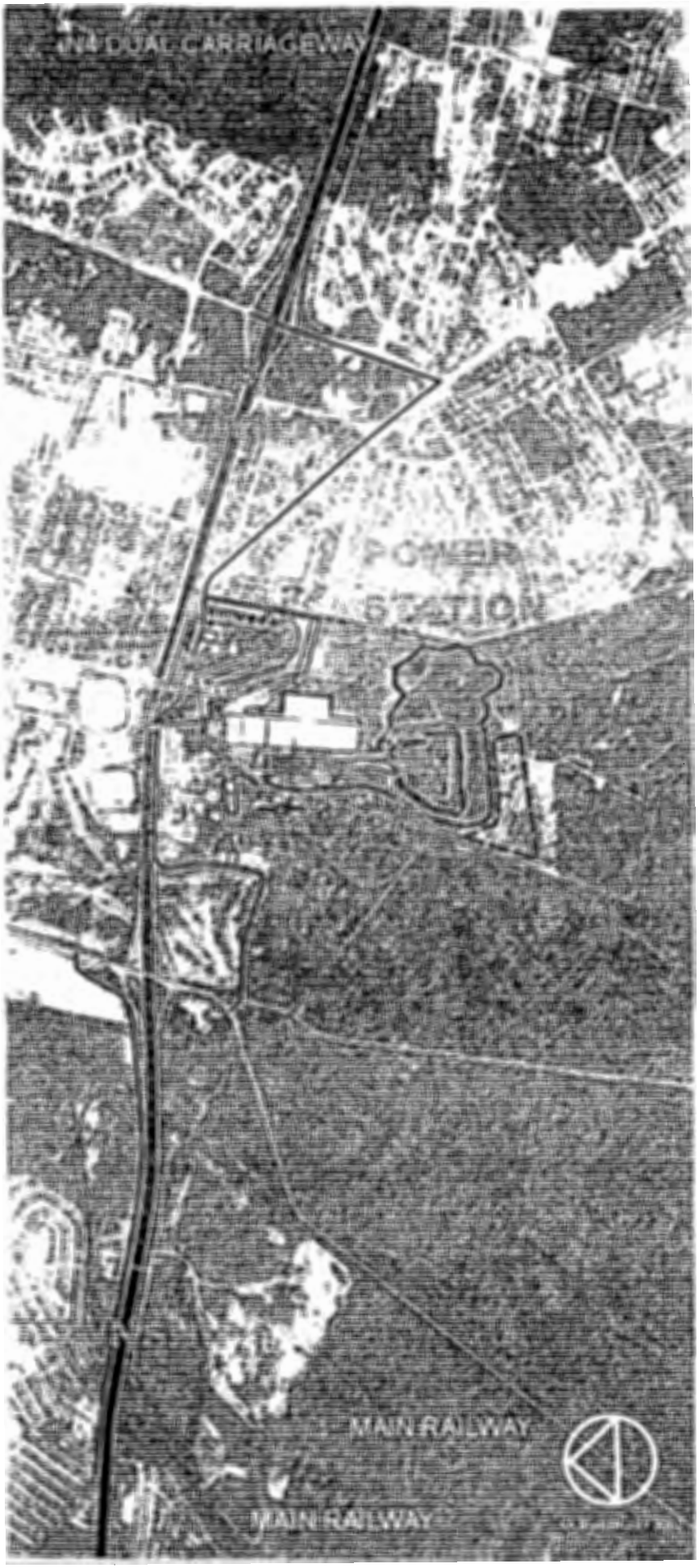


Figure 8 Relationship between Power Station and resources in 1976.

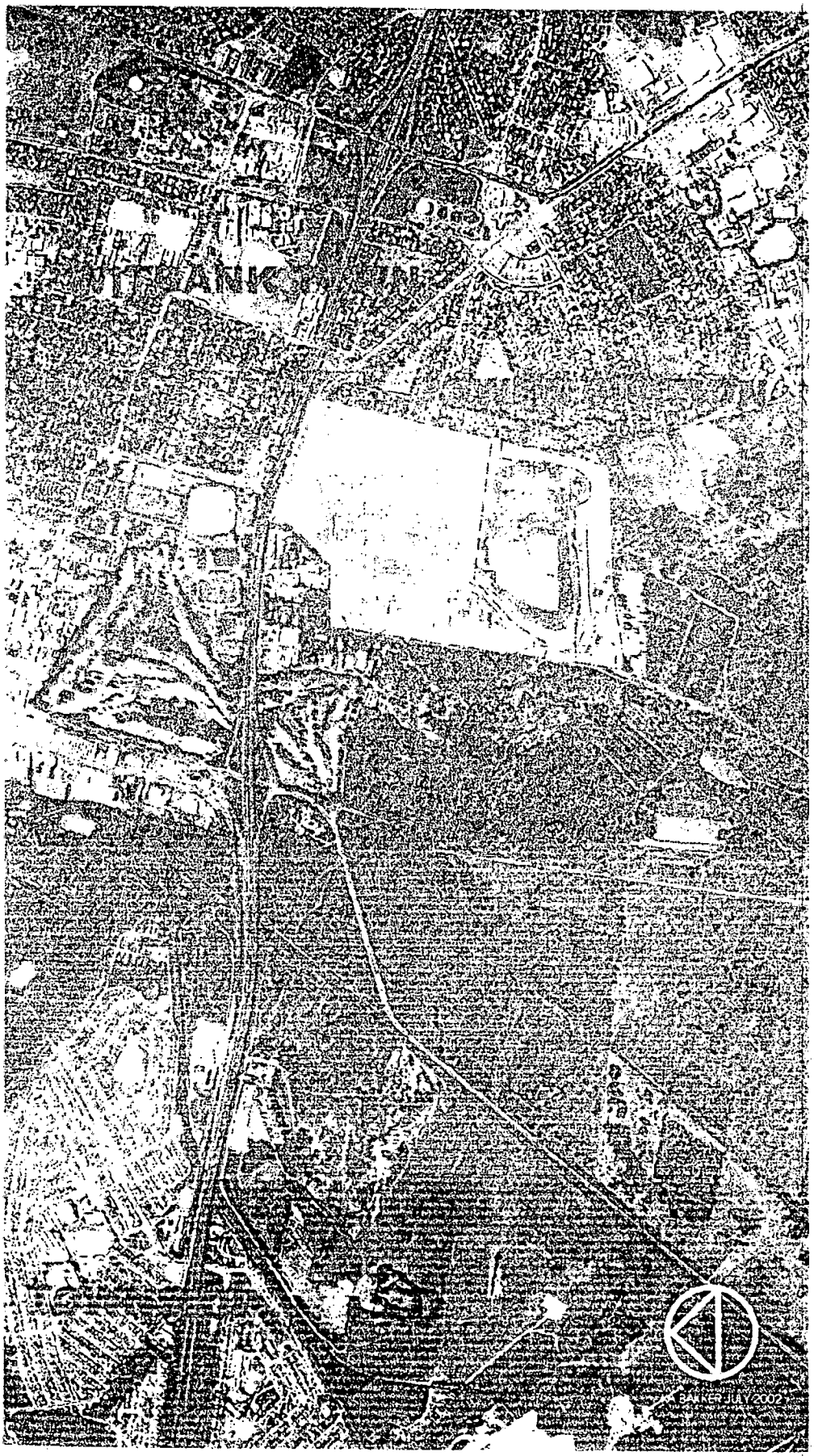


Figure 9 Relationship between Power Station and town in 1991 (1991 Base photograph + 2000 master plan composite).

YEAR	ITEM/EVENT	PRESENT STATUS
1925	The Victoria Falls & Transvaal Power Company (VFP) begins construction of the new power station on the farms Witbank and Joubertsrus	The land occupied by Eskom Park is still zoned as agricultural
1925	Houses constructed: Resident Engineer, Assistant Resident Engineer, resting, boarding, housekeeper, 3 blocks of 8 single quarters, 20 married quarters (10 semi-detached dwellings), black workers (compound)	With the exception of first five houses mentioned, two semi-detached dwellings for married employees and parts of the compound, all buildings have been demolished.
1926	Addition of 2 additional semi-detached dwellings for married employees and 1 block of single quarters	See above
1926?	Completion of club house for bowling/tennis, bowling greens, tennis courts, recreation club building	Sports club house, recreation club building still exist, remains of bowling greens visible, tennis court floor visible
1926	Completion of ponds for spray-pond cooling	Floors have been retained, rest of the system has been demolished
1926	Completion of coal staithes, railway connection with Witbank Station, hall for boilers and generators, transmitter park, administration office, workshop buildings	Staithes, transmitter park and hall have been demolished, railway connection, office and workshop buildings still exist
3.5.1926	Starting up of first 20 000 KW set with 4 boilers	Set was removed when power station became defunct and hall was demolished.
15.7.1926	Starting up of second 20 000 KW set with 4 boilers	As above
1.9.1926	Bernard Marchand appointed as Resident Engineer	
25.10.1926	Starting up of third 20 000 KW set with 4 boilers	Set was removed when power station became defunct
1926	4th 20 000 KW generating set with 3 boilers constructed	As above
1926	Feedheating introduced	As above
1.7.1927	Witbank power station placed in commercial operation	
1927	5th 20 000 KW generating set with 1 boiler constructed	Set was removed when power station became defunct
August 1927	Start of 380/220V distribution system in Witbank	
1929	Nine collieries in Witbank district connected	
1930	300 black workers at power station living in compound	
1931	Output decreased by 2,5% due to loading conditions and lack of duff coal	
1934	Four additional 70/80 000 pound steam per hour boilers installed	Removed when station closed down
1935	Extension of transmission and	

YEAR	ITEM/EVENT	PRESENT STATUS
	distribution systems to all producing collieries in Witbank district and many industrial consumers and farming schemes	
1937	635 consumers	
1937	Witwatersrand railway electrification scheme completed	
1939	Extensive overhaul programme	
1939-1945	Strengthening of 21 kV distribution network to cater for heavier loading by existing collieries and extension to new collieries	
1945-1950	Rapid increase in number of customers (including towns); construction of new feeders, distribution systems, generators, dams, offices	Some of these structures have been demolished
1948	Escom buys the Witbank power station and other stations and distribution systems from the VFP	
1954	Wilge power station commissioned to provide power to new mines	
1962	Komati power station commissioned to provide power to mines in eastern Mpumalanga	
1966	Camden power station commissioned	
1969	Work starts on Grootvlei power station	
1970	First set of new Hendrina power station commissioned	
1970	Witbank power station ceases operation due to the operating of larger and more modern power stations like Wilge, Camden, Grootvlei, Hendrina, Komati	

2.2 Site zoning and description

Determination of the site type

To set the physical and mental paradigm for the assessment of the Witbank power station site it is essential to determine what type of site it is. It is also essential to use this to determine the type of site it used to be (for the longest period of its existence).

The site to be a power station but currently is used for technical, administrative and educational purposes as the power station has become redundant and was demolished. This change in land-use impacted on the visual and functional character of the site that in turn had to be taken into account during the assessment of the site.

In general, various historic site types exist such as residential sites (apartment blocks and housing developments), military sites (battle fields, training facilities), mining sites (gold or any other mineral mining sites), settlements (farmsteads, villages and mission stations), and commercial sites (shopping centres and office complexes). The Witbank site can be

classified as an industrial site. Various industrial sites exist such as factories, power stations and pumping stations.

The land on which the site is located is still zoned as agricultural land and has not been proclaimed municipal land, even though it now surrounded by residential and commercial land-uses and is located inside the boundaries of the municipality of Witbank.

Site description

Various functional zones exist:

Residential and recreational zone: senior management housing, middle management and skilled (white) employees (single quarters and family houses), labourers (African), club house, sporting fields, recreation hall

Administrative zone: offices, parking

Power generation zone: energy and electricity generation, resources supply, storage zone, waste disposal, maintenance workshops and power distribution

Services: sewage disposal, road works, power and lighting, water supply, telephone and railways (construction and operational phases)

Buildings

Buildings types include dwellings, offices, single quarters, compound, recreational buildings, factories, power generation spaces, workshops and sheds

Structures

Structure types include the transmitter tower, fences, water supply, piping, power supply

Infrastructure elements

In general the site structure was not conceived to follow an industrial grid layout of urban layouts. It seems that the site is bilobal organisation of a production system on the one side, following its own functional – process logic and a settlement precinct reflecting contemporary European town planning ideals. A green buffer of planted trees originally separated these two elements. A third component was the labourer compound hidden from view from to the southwest of the power station. The most significant roads are the entrance roads connecting the site to the rest of the town. Two current entrances are used: one from the residential area on the eastern side of the study area and another from the N4 freeway side entering from the north. They are supported by a number of smaller roads linking the clusters of activities (referred to as zones in this report) with another. From the various parking areas pedestrian routes and pathways lead to the entrances of the buildings and sheds

The roads are tarred throughout the site with parking bays located around the edges. In some industrial areas concrete supports the tarred surfaces protecting it from the impact of heavy vehicles. The roads have been altered over the years to follow the pattern of development and sequences of construction work, resulting in some routes being older than others and some service surfaces being more historic than others.

A railway line once serviced the site and the remains are significant historical markers on the site.

Activity areas

From an historical point of view there are two dominant activity areas: the dump and the open space or void left when the original power plant was demolished.

The most historical remain and significant activity area is the large and high dump located to the south of the site. It is also the most visible landmark on the site and is visible from about fourteen kilometres away travelling form west to east on the N4 freeway that cuts through Witbank towards the eastern Mpumalanga.

Planted vegetation

The site is spotted with planted vegetation but there were clumps of trees, some of which were removed during the industrial area. It seems as if trees were either planted or ether allowed to flourish to create a buffer between power plant and management housing complexes (see 1943 aerial photograph). Photographs of the construction period show a windbreak consisting of mature trees on the boundary to the north of the turbine hall.

Historical photographs also show the existence of rows of trees along the roads and the northern border of the housing complex

The mature tree specimens are mainly exotic and date back to the years when the power station was established. They include cedars, beefwood, cedar wattles, jacarandas, poplars and pines. Cedars have been planted extensively, especially in the gardens of the main entrance area. A number of indigenous mature species occur, such as karee and paperbark. Black wattles, mulberries and syringes are invasive species that have also been planted.

The location of planted trees seems to have followed the land-use whereas the types of trees are not related to land-use. Some patterns did emerge during the survey. One area where trees were planted in rows was around the bowling greens and other sporting fields, rendering shade to spectators and defining the individual sporting fields. Smaller shrubs like bottlebrushes and privets were planted to define footpaths, driveways and paved pedestrian areas. A privet hedge still exists between two of the old dwellings on the northern part of the study area. Taller trees such as conifers were planted as visual boundaries and probably as wind shelters between the residential units and the more official (office) areas. The odd pepper tree occurs around the oldest buildings on the western side of the study area.

Site landmarks

The site is flat sloping slightly from east to west and from south to north, suggesting that any building erected on the site would have an impact on its horizon. The logical consequence is that the highest building or structure would have the highest visual impact. As it is an industrial site, any tower or tall steel structure would define the visual impact it has on the surrounding environs

<u>Communications tower</u>

The communications tower is the highest structure on the site and clearly visible from the N4 freeway marking the location of the site. It is the most vertical manmade landscape feature and due to its minimalist engineering nature tends to be transparent and leaves no imprint on one's visual memory. It is still functional and remains an essential aspect of the functioning campus and to some extent focuses the mind on the centre of the site. The tower is not the only vertical element in the surrounding Witbank urban landscape as several water towers and other tall structures occur intermittently.

The dump

Contrary to the communications tower, one is continuously oriented according to the location of the dump on the southern side of the site. It is not really part of the study area but its mass and size dominates the southern horizon and it expresses itself as a well-defined boundary both visually and physically. Although it is partially covered by vegetation, the sharp angles and steep slopes of the dump are typical of a waste dump, emphasising the industrial character of the site. The dump has become a Witbank landmark and not only an Eskom landmark making it of higher significance than the telecom tower. The 1998 Master Plan is of the opinion that the dump has a negative influence on the visual quality of Eskom Park.

Existing archives and workshops buildings

The original power generation plant and ancillary buildings would have made its own visual and aesthetic statement if it still existed. The 1998 Master Plan is of the opinion that the then derelict steel structure had a negative impact on the visual quality of Eskom Park.

2.3 Current situation: General

- Former residences for Resident Engineer and other senior employees along N 4 freeway: The first four dwellings (erected in 1925) and dwellings erected later still exist and are used for education and residential purposes. They still belong to Eskom. This area is unfortunately cut off from the rest of Eskom Park by Watermeyer Street, which is a major arterial serving the southeastern suburbs of Witbank.
- Recreation facilities: The club house is used by a security company, but the bowling green, tennis court etc are redundant
- Semi-detached dwellings: Of the original twelve, only two have survived and are in use as office accommodation by Eskom.
- Recreation Hall: This building still exists and is used by Eskom as accommodation for Industrelek.
- Housekeeper's dwelling (next to Recreation Hall): This building is used as an annexe to the hall.
- Ponds for spray-pond cooling: The foundations of these massive structures still exist. Various industrial buildings have been erected on them. One foundation is used as a helicopter pad.
- Coal-staithes, boiler house, generator house: Despite the fact that they were older than sixty years and hence were protected in terms of the National Heritage Resources Act and its predecessor (National Monuments Act), these massive structures were (illegally) demolished between 1998 and 2002, leaving behind grassed-over wasteland.
- Workshop buildings: The various workshop buildings, erected in and since 1925, still exist. They are in various stages of repair and are used to store Eskom archives and other materials.
- Administration office and outbuildings: Still exists and is used as office and storage.
- Ash-dump: The huge ash-dump is a major landmark.
- Compound: The remains of the original compound (west of the ash-dump) are used for storage and industrial purposes.
- Railways: A few railway tracks have remained.
- Landscaping: There are visible and impressive reminders of the original landscaping around the residential component of the former power station.

2.4 Current situation: Specific heritage elements

See Addendum A

PART 3: INTERPRETATION AND SIGNIFICANCE OF HERITAGE RESOURCES AT ESKOM PARK IN TERMS OF SECTION 3(3) AND 38(3)(b) OF THE NATIONAL HERITAGE RESOURCES ACT

3.1 General remarks

Macro context

Witbank was established in 1906 on a farm originally known as Swartbos. The present name is derived from a light-coloured rock outcrop near the spot where the first coalmine shaft was sunk in the 1890s, which offered refuge to Winston Churchill after his escape from the Staatsmodelschool in Pretoria on 12 December 1900. In 1906 a health committee was instituted and in 1910 the town acquired municipal status.

The extensive coal mining in the Witbank district and the establishment of numerous light and heavy industries resulted in rapid development. Consequently some of the most important industries in South Africa were established at or near Witbank. In accordance with the Power Act of 1910 the VFP wanted to establish a large power station in this area. The area was ideally suited for such an undertaking because of coalfields (the most important ones north of the Vaal River) and an abundance of water. Such a power station would also be able to provide electricity to the Witwatersrand goldfields.

Both within a district and regional context the Witbank power station played a role of major significance:

- It encouraged major industrial and agricultural development around Witbank and in other Highveld districts.
- Although constructed and operated by the VFP, it was Escom's first large thermal power station on the Highveld.
- Although constructed and operated by the VFP, it was also the first Escom power station established after the Commission was instituted in 1923.
- For many years the Witbank power station was the largest of Escom's power stations.
- The Witbank power station is associated with the life of Bruce Marchand (1895-1972), a pioneer in the field of electricity supply in South Africa. Marchand was the power station's first Resident Engineer.

Site context

Aesthetic value

The Eskom Park heritage resources exhibit particular aesthetic characteristics valued by a community or cultural group.

Contrary to the site projecting only an industrial aesthetic with steel structures clad in corrugated iron and tall chimneys interspersed in between, it also presents a strong residential character with single storey gabled buildings.

Contrary to a factory site (compare manufacturing plants of ISCOR) where all the buildings tend to be located close to another to cut transport costs from one manufacturing process to another, the building fabric of the Eskom site is dispersed over a large area and even the large new sheds are not clustered together to create a perception of a congested and concentrated site.

The only expression of an "old" aesthetic is presented by the single storey un-plastered brick buildings such as the old main block, offices and club house. The 1998 Master Plan is of the

opinion that the aesthetics of the historical architecture have a positive influence on the visual quality of the site.

Of particular significance are the garden areas in the residential and commercial portions of Eskom Park, which are remainders of the "garden city" concept of providing accommodation to employees. These areas make a positive contribution to the visual quality of the site. The choice of species creates a pleasing contract between the evergreen cedars and the deciduous pin oaks.

Historic value

The Eskom Park heritage resources are important in the pattern of South African history.

The historic value of the site and ESCOM in Witbank lies on various levels. On a micro scale the individual buildings and structures add value to each other as remnants of those first years of the generation of electrical power. The most significant value of the site is its position in the long history of growth of ESCOM: the oldest power station – even though the physical evidence of the power plant has been demolished.

A second level of significance lies with the site and Eskom's role in the development and growth of Witbank as a town, associated with the development of the Eastern Highveld.

The third level of significance is defined by the role of this power station as a model and archetype of later Eskom models for power stations elsewhere in the country

Scientific value

The Eskom Park heritage resources demonstrate a high degree of creative and technical achievement during the 1920s.

Scientific value should be read in tandem with technological value. The site with its buildings and structures represent various levels of scientific and technological sophistication and robustness at a particular time in the history of electricity generation.

It is also interesting to note that all steelwork was imported from Scotland.

Social value

The Eskom Park heritage resources have a strong association with the Witbank community.

The site does not directly represent Eskom's contribution to the social upliftment of the people of Witbank at a particular point in time. Eskom's impact on the residents of Witbank evolved over a long period of time. From a social-historical point of view Eskom's contribution cannot be measured as a single historical event (on particular day or year) but as a continuous replenishment of the social fabric of the town. People were taken into its labour force, they were trained on the site and some were housed on the premises to accommodate problems associated with long distances from home and lack of suitable housing in town

3.2 Significance of specific heritage elements

See Addendum A

PART 4: ASSESSMENT OF IMPACT OF FUTURE DEVELOPMENT IN TERMS OF SECTION 38(3)(c) – (g) OF THE NATIONAL HERITAGE RESOURCES ACT

4.1 Cultural and legal issues that may impact on the Eskom Park heritage resources

Issues such as job creation and urban development (two of President Mbeki's presidential imperatives) may have an influence on decisions as to what to do with the remaining heritage resources at Eskom Park. We are of the opinion that a sensitive approach to the rehabilitation of these resources will enhance job creation and urban development.

The other major issue is a legal one. In terms of Section 34(1) of the National Heritage Resources Act, no structures or part of structures older than 60 years may be altered or demolished without a permit from the provincial heritage resources agency. All the affected heritage resources at Eskom Park (workshop buildings, houses, recreation facilities, offices) are definitely older than sixty years.

4.2 Impact on individual heritage resources

See Addendum A

PART 5: RECOMMENDATIONS

5.1 General recommendations

1. Eskom's databases (archival material such as plans, maps, photographic material) must continue to enjoy protection and maintenance as corporate policy.
2. There is a need for specific heritage programmes, in particular the recording of oral evidence regarding several aspects of the company through an oral history programme: engineering aspects, technological innovation, scientific experimentation, construction - structural engineering and workers' histories.
3. Future development and planning must take place according to zoning, based on and in sympathy with the historic land-use patterns, special divisions and layout of the site.
4. New architectural designs must be in sympathy with the architectural vocabularies in each functional zone.
5. Contemporary development needs must be combined with historic space-structure/landscape and architectural fabric based on rehabilitation guidelines as presented in this report.
6. The historic character and significance of the site must be emphasises by erecting information plaques/signage, marking of historical fabric outlines/extremities, landscape and urban design elements that would enhance legibility resulting in the possible exploitation of the site's potential as a heritage site in the Witbank urban framework and as a possible network of historical power supply facilities.
7. In terms of Section 34(1) of the National Heritage Resources Act, no structures or part of structures older than 60 years may be altered or demolished without a permit from the provincial heritage resources agency. All the affected heritage resources at Eskom Park (workshop buildings, houses, recreation facilities, offices) are definitely older than sixty years.
8. Until the new function of the heritage resources is clear in terms of new developments, these resources (sites, structures, buildings) must be preserved (see Addendum B).
9. To minimise the impact of new development, any such development actions/interventions must comply with the principles, approaches and guidelines for rehabilitation (see Addendum C). Note that the proposed rehabilitation principles, approaches and guidelines include actions/interventions relating to preservation.

5.2 Recommendations regarding specific heritage resources

See Addendums A, B, C

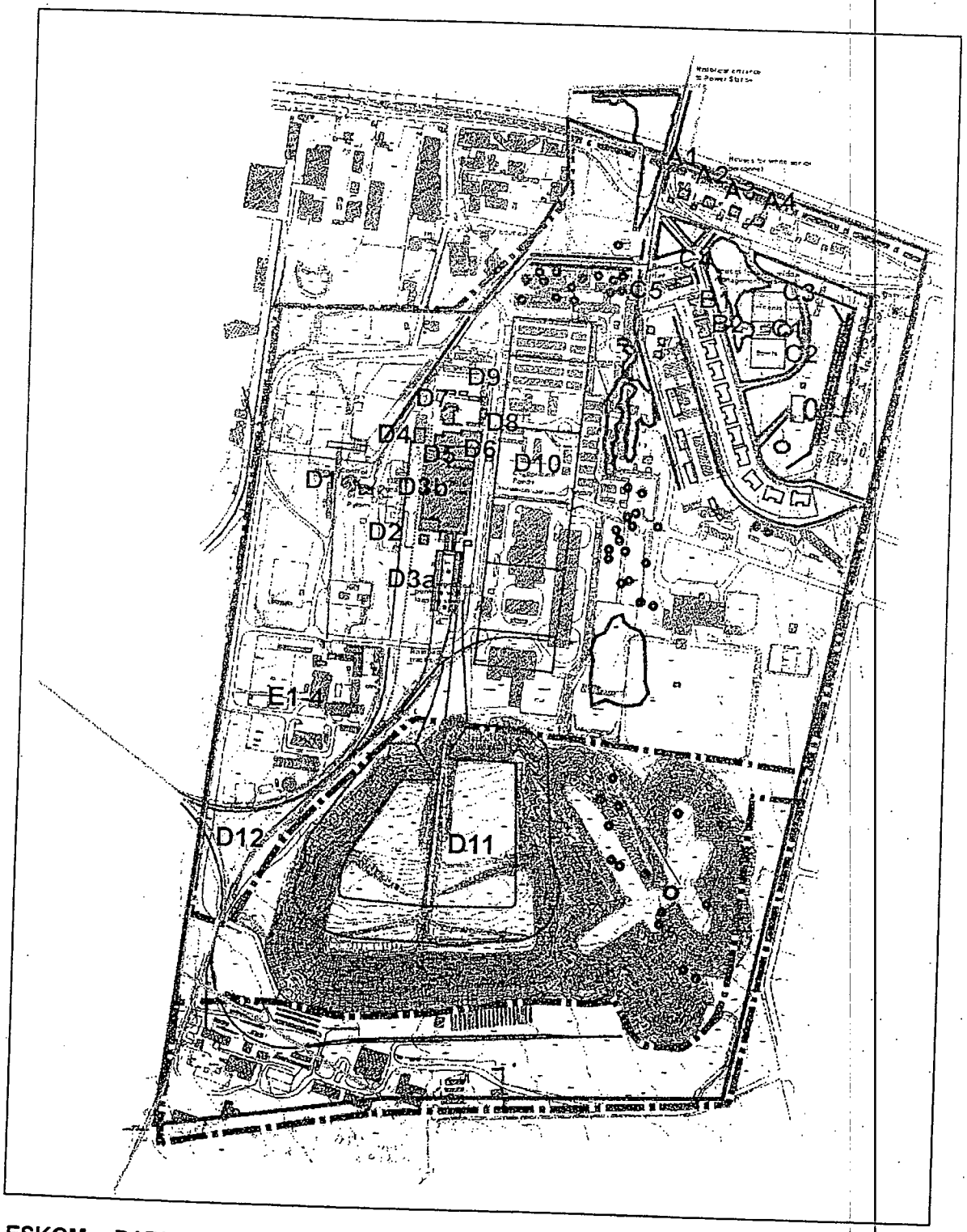
Addendum A lists the heritage resources separately and summarises their history, current use, impact of proposed development and management actions/interventions to minimise these impacts.

Addendum B contains standards, approaches and guidelines for short-term preservation of the Eskom Park heritage resources.

Addendum C contains standards, approaches and guidelines for medium- to long-term rehabilitation of the Eskom Park heritage resources.

-oOo-

ADDENDUM A



ESKOM PARK 1998 MASTER PLAN WITH 1943 AERIAL PHOTOGRAPH SUPERIMPOSED SHOWING HERITAGE RESOURCES ZONED FROM A - E

ADDENDUM A: SUMMARY OF MAPPING, RECORDING, SIGNIFICANCE, IMPACT ASSESSMENT AND MANAGEMENT RECOMMENDATIONS CONCERNING INDIVIDUAL HERITAGE RESOURCES AT ESKOM PARK

ZONE	ITEM	MAPPING AND RECORDING			SIGNIFICANCE		IMPACT ASSESSMENT		
		Description	**Current status**	**Remarks**	**Level**	**Criteria (see footnote at end of table)**	**Type of development (1998 Plan)**	**Level of impact**	**Recommended management actions**
A	1 - 4	Houses for Resident Engineer, Assistant RE, resting, boarding	Leased by Eskom to tenants for accommodation	Built 1925 – cut off from power station site by road	High	d, e, g, h	Commercial and offices	Medium to high	1. Document 2. Preserve 3. Rehabilitate 4. Monitor 5. Do not demolish (older than 60 years)
	5 - 7	Additional senior management houses	Leased by Eskom to tenants for residence and education	Built between 1925 and 1933	High	d, e, g	Commercial and offices	Medium to high	As above
B	1, 2	Semi-detached houses for married white employees	Used as Eskom offices	Built 1925 – 10 other units demolished	High	d, e, g	Retail and commercial	Medium to high	As above
C	1	Sports club house	Used by security company	Built 1925 – Eskom logo in paving	High	d, e, g	Retail and commercial	Medium to high	As above
	2	Old bowling green	Derelict	Est. 1925	High	d, e, g	Retail and commercial	Medium	1. Leave as open parkland space (preserve) 2. Incorporate in new landscaping 3. Re-use if possible
	3	Old tennis courts	Derelict	Est. 1925	High	d, e, g	Retail and commercial	Medium	As above

ZONE	ITEM	MAPPING AND RECORDING			SIGNIFICANCE		IMPACT ASSESSMENT		
		Description	Current status	Remarks	Level	Criteria (see footnote at end of table)	Type of development (1998 Plan)	Level of impact	Recommended management actions
C	4	Recreation club house/hall	Used by Industrelek	Built 1925	High	d, e, g	Retail and commercial	Medium to high	1. Document 2. Preserve 3. Rehabilitate 4. Monitor 5. Do not demolish (older than 60 years)
	5	Residence of former club manager	Used by Eskom Agrelek	Built 1925 as housekeeper's dwelling	High	d, e, g	Retail and commercial	Medium to high	As above
D	1	Power station admin. office	Used by Eskom for office and storage	Built 1925	High	a, g	Industry	Medium	1. Document 2. Preserve 3. Rehabilitate as office 4. Monitor 5. Do not demolish
	2	Site of transmitter park	Vacant wasteland	Est. 1925	Medium to high	a, f	Industry	Low	1. New uses/structures must reflect original layout and use of site 2. Information boards and place/street names
	3a, 3b	Site of coal staithes, boiler house,	Vacant land	Built 1925 – various	High	a, f	Industry	Low to medium	As above
		generator hall		additions later					
	4	Workshop building	Used as archive storage	Built between 1925 and 1933	High	a, d, e, f	Industry	Medium to high	As for D 1

ZONE	ITEM	MAPPING AND RECORDING			SIGNIFICANCE		IMPACT ASSESSMENT		
		Description	Current status	Remarks	Level	Criteria (see footnote at end of table)	Type of development (1998 Plan)	Level of impact	Recommended management actions
D	5	Workshop building	Used as storage for archives etc	Built 1925 as boiler workshop	High	a, d, e, f	Industry	Medium to high	1. Document 2. Preserve 3. Rehabilitate for light industrial purposes 4. Monitor 5. Do not demolish
	6	Workshop building	Used as storage	Built 1925-1926 with later extensions	High	a	Industry	Medium to high	As above
	7	Workshop store	Used as storage	Built 1925	High	a	Industry	Medium to high	As above
	8	Workshop store	Used as storage	Built between 1925 and 1933	Medium to low	a	Industry	Medium to low	As above
	9	Workshop store	Used for storage	Built 1925 as oil store	Medium	a	Industry	Medium to low	As above
	10	Cooling pond floors	Used as foundations for recent buildings and helicopter	Built 1925 as pond for spray-pond cooling	High	a	Industry	Low	Interpretive signage
	11	Ash dump	Redundant	Est. 1925-1970	High	a	None	Low	Dump is an environmental threat – consult SAHRA about retention of portion

ZONE	ITEM	MAPPING AND RECORDING			SIGNIFICANCE		IMPACT ASSESSMENT		
		Description	Current status	Remarks	Level	Criteria (see footnote at end of table)	Type of development (1998 Plan)	Level of impact	Recommended management actions
	12	Railway lines	Redundant	Constructed 1925	High	a	Industry	Medium to low	1. Retain and interpret portion 2. Include route in new designs for site
E	1 - 4	Buildings of former labourers' compound	Used as storage and industrial	Erected 1925 with latter additions	High	a, b, c, d, g	Industry	High	1. Document 2. Preserve 3. Rehabilitate 4. Monitor 5. Do not demolish (older than 60 years 6. Oral history
Open spaces		Landscaped areas in and around Zones B and C	Parkland	Established between 1925 and 1970	High	d, e, g	Retail and commercial	Medium to high	1. Document 2. Preserve 3. Replant new lanes to complement original lanes

FOOTNOTE: CRITERIA OF HERITAGE SIGNIFICANCE (SECTION 3(3) OF THE NATIONAL HERITAGE RESOURCES ACT)

a Importance in the community or pattern of South Africa's history: In this case the history of Eskom and power generation
b Possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage: In this case the history of labour compounds
c Potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage: In this case the history of black workers at Eskom power stations
d Importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects: In this case staff houses and villages for Eskom employees
e Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group: In this case architectural and visual qualities
f Importance in demonstrating a high degree of creative or technical achievement at a particular period: In this case the history and technology of power generation

g Strong or special association with a particular community or cultural group for social, cultural and spiritual reasons: In this case the Witbank community and the Eskom corps of employees

h Strong or special association with the life of a person, group or organisation of importance in the history of South Africa: In this case Bruce Marchand, the first Resident Engineer

I Significance relating to the history of slavery in South Africa: Not relevant in this context

ADDENDUM B

RECOMMENDED SHORT-TERM PRESERVATION ACTIONS/INTERVENTIONS

1. DEFINITION

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

Most of the heritage resources at Eskom Park are in need of preservation, irrespective of whether there will soon be subject to development or not. This document suggests standards and guidelines to achieve this objective.

2. STANDARDS

1. A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces, and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.
2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, colour, and texture.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archaeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

3. APPROACH

When the property's distinctive materials, features, and spaces are essentially intact and thus convey the historic significance without extensive repair or replacement; when depiction at a particular period of time is not appropriate; and when a continuing or new use does not require additions or extensive alterations, Preservation may be considered as a treatment. Prior to undertaking work, a documentation plan for Preservation should be developed:

Choosing Preservation as a Treatment

In Preservation, the options for replacement are less extensive than in the treatment, Rehabilitation. This is because it is assumed at the outset that building materials and character-defining features are essentially intact, i.e., that more historic fabric has survived, unchanged over time. The expressed goal of preservation treatment is retention of the building's existing form, features and detailing. This may be as simple as basic maintenance of existing materials and features or may involve preparing a historic structure report, undertaking laboratory testing such as paint and mortar analysis, and hiring conservators to perform sensitive work such as reconstituting interior finishes. Protection, maintenance, and repair are emphasized while replacement is minimized.

3.1 Identify, Retain, and Preserve Historic Materials and Features

The guidance for the treatment **Preservation** begins with recommendations to identify the form and detailing of those architectural materials and features that are important in defining the building's historic character and which must be retained in order to preserve that character. Therefore, guidance on ***identifying, retaining, and preserving*** character-defining features is always given first. The character of a historic building may be defined by the form and detailing of exterior materials, such as masonry, wood, and metal; exterior features, such as roofs, porches, and windows; interior materials, such as plaster and paint; and interior features, such as

mouldings and stairways, room configuration and spatial relationships, as well as structural and mechanical systems; and the building's site and setting.

3.2 Stabilize Deteriorated Historic Materials and Features as a Preliminary Measure

Deteriorated portions of a historic building may need to be protected thorough preliminary stabilization measures until additional work can be undertaken. ***Stabilizing*** may include structural reinforcement, weatherization, or correcting unsafe conditions. Temporary stabilization should always be carried out in such a manner that it detracts as little as possible from the historic building's appearance. Although it may not be necessary in every preservation project, stabilization is nonetheless an integral part of the treatment Preservation; it is equally applicable, if circumstances warrant, for the other treatments.

After identifying those materials and features that are important and must be retained in the process of **Preservation** work, then ***protecting and maintaining*** them are addressed. Protection generally involves the least degree of intervention and is preparatory to other work. For example, protection includes the maintenance of historic materials through treatments such as rust removal, caulking, limited paint removal, and re-application of protective coatings; the cyclical cleaning of roof gutter systems; or installation of fencing, alarm systems and other temporary protective measures. Although a historic building will usually require more extensive work, an overall evaluation of its physical condition should always begin at this level.

4. PRESERVATION GUIDELINES

These guidelines deal with the following components of heritage resources:

- Masonry
- Wood
- Architectural metals
- Roofs
- Windows
- Entrances and porches
- Interior structural systems
- Interior spaces, features, finishes
- Interior mechanical systems
- Site
- Setting

4.1 Exterior materials

4.1.1 Masonry

Identify, Retain and Preserve

Recommended

Identifying, retaining, and preserving masonry features that are important in defining the overall historic character of the building such as walls, brackets, railings, cornices, window architraves, door pediments, steps, and columns; and details such as tooling and bonding patterns, coatings, and colour.

Not recommended

Altering masonry features which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Replacing historic masonry features instead of repairing or replacing only the deteriorated masonry.

Applying paint or other coatings such as stucco to masonry that has been historically unpainted or uncoated.

Removing paint from historically painted masonry.

Changing the type of paint or coating or its colour.

Stabilize

Recommended

Stabilizing deteriorated or damaged masonry as a preliminary measure, when necessary, prior to undertaking appropriate preservation work.

Not recommended

Failing to stabilize deteriorated or damaged masonry until additional work is undertaken, thus allowing further damage to occur to the historic building.

Protect and Maintain

Recommended

Protecting and maintaining masonry by providing proper drainage so that water does not stand on flat, horizontal surfaces or accumulate in curved decorative features.

Cleaning masonry only when necessary to halt deterioration or remove heavy soiling.

Carrying out masonry surface cleaning tests after it has been determined that such cleaning is appropriate. Tests should be observed over a sufficient period of time so that both the immediate and the long-range effects are known to enable selection of the gentlest method possible.

Cleaning masonry surfaces with the gentlest method possible, such as low-pressure water and detergents, using natural bristle brushes.

Inspecting painted masonry surfaces to determine whether repainting is necessary.

Removing damaged or deteriorated paint only to the next sound layer using the gentlest method possible (e.g., handscraping) prior to repainting.

Applying compatible paint coating systems following proper surface preparation.

Repainting with colours that are historically appropriate to the building and district.

Evaluating the existing condition of the masonry to determine whether more than protection and maintenance are required, that is, if repairs to masonry features will be necessary.
Not Recommended

Failing to evaluate and treat the various causes of mortar joint deterioration such as leaking roofs or gutters, differential settlement of the building, capillary action, or extreme weather exposure.

Cleaning masonry surfaces when they are not heavily soiled, thus needlessly introducing chemicals or moisture into historic materials.

Cleaning masonry surfaces without testing or without sufficient time for the testing results to be of value.

Sandblasting brick or stone surfaces using dry or wet grit or other abrasives. These methods of cleaning permanently erode the surface of the material and accelerate deterioration.

Using a cleaning method that involves water or liquid chemical solutions when there is any possibility of freezing temperatures.

Cleaning with chemical products that will damage masonry, such as using acid on limestone or marble, or leaving chemicals on masonry surfaces.
Applying high-pressure water cleaning methods that will damage historic masonry and the mortar joints.

Removing paint that is firmly adhering to, and thus protecting, masonry surfaces.

Using methods of removing paint that are destructive to masonry, such as sandblasting, application of caustic solutions, or high pressure water blasting.

Failing to follow manufacturers' product and application instructions when repainting masonry.

Using new paint colours that are inappropriate to the historic building and district.

Failing to undertake adequate measures to assure the protection of masonry features.

4.1.2 Wood

Identify, Retain and Preserve

Recommended

Identifying, retaining, and preserving wood features that are important in defining the overall historic character of the building such as siding, cornices, brackets, window architraves, and doorway pediments; and their paints, finishes, and colours.

Not recommended

Altering wood features which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Replacing historic wood features instead of repairing or replacing only the deteriorated wood.

Changing the type of paint or finish and its colour.

Stabilize

Recommended

Stabilizing deteriorated or damaged wood as a preliminary measure, when necessary, prior to undertaking appropriate preservation work.

Not Recommended

Failing to stabilize deteriorated or damaged wood until additional work is undertaken, thus allowing further damage to occur to the historic building.

Protect and Maintain

Recommended

Protecting and maintaining wood features by providing proper drainage so that water is not allowed to stand on flat, horizontal surfaces or accumulate in decorative features.

Applying chemical preservatives to wood features such as beam-ends or outriggers that are exposed to decay hazards and are traditionally unpainted.

Retaining coatings such as paint that help protect the wood from moisture and ultraviolet light.

Paint removal should be considered only where there is paint surface deterioration and as part of an overall maintenance program which involves repainting or applying other appropriate protective coatings. Inspecting painted wood surfaces to determine whether repainting is necessary or if cleaning is all that is required.

Removing damaged or deteriorated paint to the next sound layer using the gentlest method possible (handscraping and handsanding), then repainting.

Using with care electric hot-air guns on decorative wood features and electric heat plates on flat wood surfaces when paint is so deteriorated that total removal is necessary prior to repainting.

Using chemical strippers primarily to supplement other methods such as handscraping, handsanding and the above-recommended thermal devices. Detachable wooden elements such as shutters, doors, and columns may--with the proper safeguards--be chemically dip-stripped.

Applying compatible paint coating systems following proper surface preparation.

Repainting with colours that are appropriate to the historic building and district.

Evaluating the existing condition of the wood to determine whether more than protection and maintenance are required, that is, if repairs to wood features will be necessary.

Not Recommended

Failing to identify, evaluate, and treat the causes of wood deterioration, including faulty flashing, leaking gutters,

Identifying the particular type of metal prior to any cleaning procedure and then testing to assure that the gentlest cleaning method possible is selected or determining that cleaning is inappropriate for the particular metal.

Cleaning soft metals such as lead, tin, copper, tern plate, and zinc with appropriate chemical methods because their finishes can be easily abraded by blasting methods.

Using the gentlest cleaning methods for cast iron, wrought iron, and steel--hard metals--in order to remove paint build-up and corrosion. If handscraping and wire brushing have proven ineffective, low pressure grit blasting may be used as long as it does not abrade or damage the surface.

Applying appropriate paint or other coating systems after cleaning in order to decrease the corrosion rate of metals or alloys.

Repainting with colours that are appropriate to the historic building or district.

Applying an appropriate protective coating such as lacquer to an architectural metal feature such as a bronze door that is subject to heavy pedestrian use.

Evaluating the existing condition of the architectural metals to determine whether more than protection and maintenance are required, that is, if repairs to features will be necessary.

Not Recommended

Failing to identify, evaluate, and treat the causes of corrosion, such as moisture from leaking roofs or gutters. Placing incompatible metals together without providing a reliable separation material. Such incompatibility can result in galvanic corrosion of the less noble metal, e.g., copper will corrode cast iron, steel, tin, and aluminium.

Exposing metals that were intended to be protected from the environment. Applying paint or other coatings to metals such as copper, bronze, or stainless steel that were meant to be exposed.

Using cleaning methods that alter or damage the historic colour, texture, and finish of the metal; or cleaning when it is inappropriate for the metal.

Removing the patina of historic metal. The patina may be a protective coating on some metals, such as bronze or copper, as well as a significant historic finish.

Cleaning soft metals such as lead, tin, copper, tern plate, and zinc with grit blasting which will abrade the surface of the metal.

Failing to employ gentler methods prior to abrasively cleaning cast iron, wrought iron or steel; or using high pressure grit blasting.

Failing to re-apply protective coating systems to metals or alloys that require them after cleaning so that accelerated corrosion occurs.

Using new colours that are inappropriate to the historic building or district.

Failing to assess pedestrian use or new access patterns so that architectural metal features are subject to damage by use or inappropriate maintenance such as salting adjacent sidewalks.

Failing to undertake adequate measures to assure the protection of architectural metal features.

4.2 Exterior features

4.2.1 Roofs

Identify, Retain and Preserve

Recommended

Identifying, retaining, and preserving roofs--and their functional and decorative features--that is important in defining the overall historic character of the building. This includes the roof's shape, such as hipped, gambrel, and mansard; decorative features such as cupolas, cresting, chimneys, and weathervanes; and roofing material such as slate, wood, clay tile, and metal, as well as its size, colour, and patterning.

Not Recommended

Altering the roof and roofing materials that are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Replacing historic roofing material instead of repairing or replacing only the deteriorated material.

Changing the type or colour of roofing materials.

Stabilize

Recommended

Stabilizing deteriorated or damaged roofs as a preliminary measure, when necessary, prior to undertaking appropriate preservation work.

Not Recommended
Failing to stabilize a deteriorated or damaged roof until additional work is undertaken, thus allowing further damage to occur to the historic building.

Protect and Maintain

Recommended

Protecting and maintaining a roof by cleaning the gutters and downspouts and replacing deteriorated flashing. Roof sheathing should also be checked for proper venting to prevent moisture condensation and water penetration; and to insure that materials are free from insect infestation.

Providing adequate anchorage for roofing material to guard against wind damage and moisture penetration.

Protecting a leaking roof with plywood and building paper until it can be properly repaired.

Not Recommended

Failing to clean and maintain gutters and downspouts properly so that water and debris collect and cause damage to roof fasteners, sheathing, and the underlying structure.

Allowing roof fasteners, such as nails and clips to corrode so that roofing material is subject to accelerated deterioration.

Permitting a leaking roof to remain unprotected so that accelerated deterioration of historic building materials--masonry, wood, plaster, paint and structural members--occurs.

4.2.2 Windows

Identify, Retain and Preserve

Recommended

Identifying, retaining, and preserving windows--and their functional and decorative features--that are important in defining the overall historic character of the building. Such features can include frames, sash, muntins, glazing, sills, heads, hoodmolds, panelled or decorated jambs and mouldings, and interior and exterior shutters and blinds.

Conducting an in-depth survey of the condition of existing windows early in preservation planning so that repair and upgrading methods and possible replacement options can be fully explored.

Not Recommended

Altering windows or window features which are important in defining the historic character of the building so that, as a result, the character is diminished.

Changing the historic appearance of windows by replacing materials, finishes, or colours which noticeably change the sash, depth of reveal, and muntin configuration; the reflectivity and colour of the glazing; or the appearance of the frame.

Obscuring historic window trim with metal or other material.

Replacing windows solely because of peeling paint, broken glass, stuck sash, and high air infiltration. These conditions, in themselves, are no indication that windows are beyond repair.

Stabilize

Recommended

Stabilizing deteriorated or damaged windows as a preliminary measure, when necessary, prior to undertaking appropriate preservation work.

Not Recommended

Failing to stabilize a deteriorated or damaged window until additional work is undertaken, thus allowing further damage to occur to the historic building.

Protect and Maintain

Recommended

Protecting and maintaining the wood and architectural metals that comprise the window frame, sash, muntins, and surrounds through appropriate surface treatments such as cleaning, rust removal, limited paint removal, and re-application of protective coating systems.

Making windows weather tight by re-caulking and replacing or installing weather-stripping. These actions also improve thermal efficiency.

Evaluating the existing condition of materials to determine whether more than protection and maintenance are required, i.e. if repairs to windows and window features will be required.

Not Recommended

Failing to provide adequate protection of materials on a cyclical basis so that deterioration of the window results.

Retrofitting or replacing windows rather than maintaining the sash, frame, and glazing.

Failing to undertake adequate measures to assure the protection of historic windows.

4.2.3 Entrances and porches

Identify, Retain and Preserve

Recommended

Identifying, retaining, and preserving entrances and porches--and their functional and decorative features--that are important in defining the overall historic character of the building such as doors, fanlights, sidelights, pilasters, entablatures, columns, balustrades, and stairs.

Not Recommended

Altering entrances and porches that are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Replacing historic entrance and porch features instead of repairing or replacing only the deteriorated material.

Stabilize

Recommended

Stabilizing deteriorated or damaged entrances and porches as a preliminary measure, when necessary, prior to undertaking appropriate preservation work.

Not Recommended

Failing to stabilize a deteriorated or damaged entrance or porch until additional work is undertaken, thus allowing further damage to occur to the historic building.

Protect and Maintain

Recommended

Protecting and maintaining the masonry, wood, and architectural metals that comprise entrances and porches through appropriate surface treatments such as cleaning, rust removal, limited paint removal, and re-application of protective coating systems.

Evaluating the existing condition of materials to determine whether more than protection and maintenance are required, that is, repairs to entrance and porch features will be necessary.

Not Recommended

Failing to provide adequate protection to materials on a cyclical basis so that deterioration of entrances and porches results.

Failing to undertake adequate measures to assure the protection of historic entrances and porches.

4.3 INTERIOR FEATURES

4.3.1 Structural systems

Identify, Retain and Preserve

Recommended

Identifying, retaining, and preserving structural systems--and individual features of systems--that are important in defining the overall historic character of the building, such as post and beam systems, trusses, summer beams, vigas, cast iron columns, above-grade stone foundation walls, or load bearing brick or stone walls.

Not Recommended

Altering visible features of historic structural systems that are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Overloading the existing structural system; or installing equipment or mechanical systems that could damage the structure.

Replacing a load bearing masonry wall that could be augmented and retained.

Leaving known structural problems untreated such as deflection of beams, cracking and bowing of walls, or racking of structural members.

Utilizing treatments or products that accelerate the deterioration of structural material such as introducing urea-formaldehyde foam insulation into frame walls.

Stabilize

Recommended

Stabilizing deteriorated or damaged structural systems as a preliminary measure, when necessary, prior to undertaking appropriate preservation work.

Not Recommended

Failing to stabilize a deteriorated or damaged structural system until additional work is undertaken, thus allowing further damage to occur to the historic building.

Protect and Maintain

Recommended

Protecting and maintaining the structural system by cleaning the roof gutters and downspouts; replacing roof flashing; keeping masonry, wood, and architectural metals in a sound condition; and ensuring that structural members are free from insect infestation.

Not Recommended

Failing to provide proper building maintenance so that deterioration of the structural system results. Causes of deterioration include subsurface ground movement, vegetation growing too close to foundation walls, improper grading, fungal rot, and poor interior ventilation that result in condensation.
Utilizing destructive probing techniques that will damage or destroy structural material.

4.3.2 Spaces, features, finishes

Identify, Retain and Preserve

INTERIOR SPACES

Recommended

Identifying, retaining, and preserving a floor plan or interior spaces that are important in defining the overall historic character of the building. This includes the size, configuration, proportion, and relationship of rooms and corridors; the relationship of features to spaces; and the spaces themselves such as lobbies, reception halls, entrance halls, double parlours, theatres, auditoriums, and important industrial or commercial spaces.

Not Recommended

Altering a floor plan or interior spaces--including individual rooms-- that are important in defining the overall historic character of the building so that, as a result, the character is diminished.

INTERIOR FEATURES AND FINISHES

Recommended

Identifying, retaining, and preserving interior features and finishes that are important in defining the overall historic character of the building, including columns, cornices, baseboards, fireplaces and mantels, panelling, light fixtures, hardware, and flooring; and wallpaper, plaster, paint, and finishes such as stencilling, marbling, and graining; and other decorative materials that accent interior features and provide colour, texture, and patterning to walls, floors, and ceilings.

Not Recommended

Altering features and finishes which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Replacing historic interior features and finishes instead of repairing or replacing only the deteriorated masonry.
Installing new decorative material that obscures or damages character-defining interior features or finishes.

Removing historic finishes, such as paint and plaster, or historic wall coverings, such as wallpaper.
Applying paint, plaster, or other finishes to surfaces that have been historically unfinished.

Stripping paint to bare wood rather than repairing or re-applying grained or marbled finishes to features such as doors and panelling.

Changing the type of finish or its colour, such as painting a previously varnished wood feature.

Stabilize

Recommended

Stabilizing deteriorated or damaged interior features and finishes as a preliminary measure, when necessary, prior to undertaking appropriate preservation work.

Not Recommended

Failing to stabilize a deteriorated or damaged interior feature or finish until additional work is undertaken, thus allowing further damage to occur to the historic building.

Protect and Maintain

Recommended

Protecting and maintaining masonry, wood, and architectural metals that comprise interior features through appropriate surface treatments such as cleaning, rust removal, limited paint removal, and reapplication of protective coatings systems.

Protecting interior features and finishes against arson and vandalism before project work begins, boarding-up windows, and installing fire alarm systems that are keyed to local protection agencies.

Protecting interior features such as a staircase, mantel, or decorative finishes and wall coverings against damage during project work by covering them with heavy canvas or plastic sheets.

Installing protective coverings in areas of heavy pedestrian traffic to protect historic features such as wall coverings, parquet flooring and panelling.

Removing damaged or deteriorated paints and finishes to the next sound layer using the gentlest method possible, then repainting or refinishing using compatible paint or other coating systems.

Repainting with colours that are appropriate to the historic building.

Limiting abrasive cleaning methods to certain industrial warehouse buildings where the interior masonry or plaster features do not have distinguishing design, detailing, tooling, or finishes; and where wood features are not finished, moulded, beaded, or worked by hand. Abrasive cleaning should only be considered after other, gentler methods have been proven ineffective.

Evaluating the existing condition of materials to determine whether more than protection and maintenance are required, that is, if repairs to interior features and finishes will be necessary.

Not Recommended

Failing to provide adequate protection to materials on a cyclical basis so that deterioration of interior features results.

Permitting entry into historic buildings through unsecured or broken windows and doors so that the interior features and finishes are damaged by exposure to weather or vandalism.
Stripping interiors of features such as woodwork, doors, windows, light fixtures, copper piping, radiators, or of decorative materials.

Failing to provide proper protection of interior features and finishes during work so that they are gouged, scratched, dented, or otherwise damaged.
Failing to take new use patterns into consideration so that interior features and finishes are damaged.

Using destructive methods such as propane or butane torches or sandblasting to remove paint or other coatings. These methods can irreversibly damage the historic materials that comprise interior features.

Using new paint colours that are inappropriate to the historic building.
Changing the texture and patina of character-defining features through sandblasting or use of abrasive methods to remove paint, discoloration or plaster. This includes both exposed wood (including structural members) and masonry.

Failing to undertake adequate measures to assure the protection of interior features and finishes.

4.3.3 Mechanical systems

<u>Identify, Retain and Preserve</u>

Recommended

Identifying, retaining, and preserving visible features of early mechanical systems that are important in defining the overall historic character of the building, such as radiators, vents, fans, grilles, plumbing fixtures, switch plates, and lights.

Not Recommended

Removing or altering visible features of mechanical systems that are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Stabilize

Recommended

Stabilizing deteriorated or damaged mechanical systems as a preliminary measure, when necessary, prior to undertaking appropriate preservation work.

Not Recommended

Failing to stabilize a deteriorated or damaged mechanical system until additional work is undertaken, thus allowing further damage to occur to the historic building.

Protect and Maintain

Recommended

Protecting and maintaining mechanical, plumbing, and electrical systems and their features through cyclical cleaning and other appropriate measures.

Preventing accelerated deterioration of mechanical systems by providing adequate ventilation of attics, crawlspaces, and cellars so that moisture problems are avoided.

Improving the energy efficiency of existing mechanical systems to help reduce the need for elaborate new equipment.

Not Recommended
Failing to provide adequate protection of materials on a cyclical basis so that deterioration of mechanical systems and their visible features results.

Enclosing mechanical systems in areas that are not adequately ventilated so that deterioration of the systems results.

Installing unnecessary climate control systems that can add excessive moisture to the building. This additional moisture can either condense inside, damaging interior surfaces, or pass through interior walls to the exterior, potentially damaging adjacent materials as it migrates.

4.4 SITE

Identify, Retain and Preserve

Recommended

Identifying, retaining, and preserving buildings and their features as well as features of the site that are important in defining its overall historic character. Site features may include circulation systems such as walks, paths, roads, or parking; vegetation such as trees, shrubs, fields, or herbaceous plant material; landforms such as terracing, berms or grading; furnishings such as lights, fences, or benches; decorative elements such as sculpture, statuary or monuments; water features including fountains, streams, pools, or lakes; and subsurface archaeological features which are important in defining the history of the site.

Retaining the historic relationship between buildings and the landscape.

Not Recommended

Altering buildings and their features or site features which are important in defining the overall historic character of the property so that, as a result, the character is diminished.

Removing or relocating buildings or landscape features, thus destroying the historic relationship between buildings and the landscape.

Stabilize

Recommended

Stabilizing deteriorated or damaged building and site features as a preliminary measure, when necessary, prior to undertaking appropriate preservation work.

Not Recommended

Failing to stabilize a deteriorated or damaged building or site feature until additional work is undertaken, thus allowing further damage to occur to the building site.

Protect and Maintain

Recommended

Protecting and maintaining buildings and sites by providing proper drainage to assure that water does not erode foundation walls; drain toward the building; or damage or erode the landscape.

Minimizing disturbance of terrain around buildings or elsewhere on the site, thus reducing the possibility of destroying or damaging important landscape features or archaeological resources.

Surveying and documenting areas where the terrain will be altered to determine the potential impact to important landscape features or archaeological resources.

Protecting, e.g., preserving in place, important archaeological resources.

Planning and carrying out any necessary investigation using professional archaeologists and modern archaeological methods when preservation in place is not feasible.

Preserving important landscape features, including ongoing maintenance of historic plant material.

Protecting building and landscape features against arson and vandalism before preservation work begins, i.e., erecting protective fencing and installing alarm systems that are keyed into local protection agencies.

Providing continued protection of historic building materials and plant features through appropriate cleaning, rust removal, limited paint removal, and re-application of protective coating systems; and pruning and vegetation management.

Evaluating the existing condition of materials and features to determine whether more than protection and maintenance are required, that is, if repairs to building and site features will be necessary.

Not Recommended

Failing to maintain adequate site drainage so that buildings and site features are damaged or destroyed; or alternatively, changing the site grading so that water no longer drains properly.

Introducing heavy machinery into areas where it may disturb or damage important landscape features or archaeological resources.

Failing to survey the building site prior to beginning work that results in damage to, or destruction of, important landscape features or archaeological resources.

Leaving known archaeological material unprotected so that it is damaged during preservation work.

Permitting unqualified personnel to perform data recovery on archaeological resources so that improper methodology results in the loss of important archaeological material.

Allowing important landscape features to be lost or damaged due to a lack of maintenance.

Permitting the property to remain unprotected so that the building and landscape features or archaeological resources are damaged or destroyed.

Removing or destroying features from the buildings or site such as wood siding, iron fencing, masonry balustrades, or plant material.

Failing to provide adequate protection of materials on cyclical basis so that deterioration of building and site feature results.

Failing to undertake adequate measures to assure the protection of building and site features.

4.5 SETTING

Identify, Retain and Preserve

Recommended

Identifying retaining, and preserving building and landscape features that are important in defining the historic character of the setting. Such features can include roads and streets, furnishings such as lights or benches, vegetation, gardens and yards, adjacent open space such as fields, parks, commons or woodlands, and important views or visual relationships.
Retaining the historic relationship between buildings and landscape features of the setting. For example, preserving the relationship between a town common and its adjacent historic houses, municipal buildings, historic roads, and landscape features.

Not Recommended

Altering those features of the setting that are important in defining the historic character.

Altering the relationship between the buildings and landscape features within the setting by widening existing streets, changing landscape materials, or constructing inappropriately located new streets or parking.

Removing or relocating historic buildings or landscape features, thus destroying their historic relationship within the setting.

Stabilize

Recommended

Stabilizing deteriorated or damaged building and landscape features of the setting as a preliminary measure, when necessary, prior to undertaking appropriate preservation work.

Not Recommended

Failing to stabilize a deteriorated or damaged building or landscape feature of the setting until additional work is undertaken, thus allowing further damage to the setting to occur.

Protect and Maintain

Recommended

Protecting and maintaining historic building materials and plant features through appropriate cleaning, rust removal, limited paint removal, and reapplication of protective coating systems; and pruning and vegetation management.

Protecting building and landscape features against arson and vandalism before preservation work begins by erecting protective fencing and installing alarm systems that are keyed into local preservation agencies.

Evaluating the existing condition of the building and landscape features to determine whether more than protection and maintenance are required, that is, if repairs to features will be necessary.

Not Recommended

Failing to provide adequate protection of materials on a cyclical basis that results in the deterioration of building and landscape features.

Permitting the building and setting to remain unprotected so that interior or exterior features are damaged.

Stripping or removing features from buildings or the setting such as wood siding, iron fencing, terra cotta balusters, or plant material.

Failing to undertake adequate measures to assure the protection of building and landscape features.

ADDENDUM C

RECOMMENDED REHABILITATION ACTIONS/INTERVENTIONS

1. DEFINITION

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values.

Within the context of international tendencies, rehabilitation is the recommended option for re-using the heritage resources at Eskom Park as part of future developments.

2. STANDARDS

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.

2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, colour, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archaeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

3. APPROACH

When repair and replacement of deteriorated features are necessary; when alterations or additions to the property are planned for a new or continued use; and when its depiction at a particular period of time is not appropriate, Rehabilitation may be considered as a treatment. Prior to undertaking work, a documentation plan for Rehabilitation should be developed.

Choosing Rehabilitation as a Treatment

In Rehabilitation, historic building materials and character-defining features are protected and maintained as they are in the treatment Preservation; however, an assumption is made prior to work that existing historic fabric has become damaged or deteriorated over time and, as a result, more repair and replacement will be required. This means that Rehabilitation interventions are preceded by interventions aimed at Preservation (Addendum B). Thus, latitude is given in the Standards for Rehabilitation and Guidelines for Rehabilitation to replace extensively deteriorated, damaged, or missing features using either traditional or substitute materials. Of the four treatments, only Rehabilitation includes an opportunity to make possible an efficient contemporary use through alterations and additions.

3.1 Identify, Retain, and Preserve Historic Materials and Features

Like Preservation, guidance for the treatment Rehabilitation begins with recommendations to identify the form and detailing of those architectural materials and features that are important in defining the building's historic character and which must be retained in order to preserve that character. Therefore, guidance on *identifying, retaining, and preserving* character-defining features is always given first. The character of a historic building may be defined by the form and detailing of exterior materials, such as masonry, wood, and metal; exterior features, such as roofs, porches, and windows; interior materials, such as plaster and paint; and interior features, such as mouldings and stairways, room configuration and spatial relationships, as well as structural and mechanical systems.

3.2 Protect and Maintain Historic Materials and Features

After identifying those materials and features that are important and must be retained in the process of Rehabilitation work, then ***protecting and maintaining*** them are addressed. Protection generally involves the least degree of intervention and is preparatory to other work. For example, protection includes the maintenance of historic material through treatments such as rust removal, caulking, limited paint removal, and re-application of protective coatings; the cyclical cleaning of roof gutter systems; or installation of fencing, alarm systems and other temporary protective measures. Although a historic building will usually require more extensive work, an overall evaluation of its physical condition should always begin at this level.

3.3 Repair Historic Materials and Features

Next, when the physical condition of character-defining materials and features warrants additional work ***repairing*** is recommended. **Rehabilitation** guidance for the repair of historic materials such as masonry, wood, and architectural metals again begins with the least degree of intervention possible such as patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading them according to recognized preservation methods. Repairing also includes the limited replacement in kind--or with compatible substitute material--of extensively deteriorated or missing parts of features when there are surviving prototypes (for example, brackets, dentils, steps, plaster, or portions of slate or tile roofing). Although using the same kind of material is always the preferred option, substitute material is acceptable if the form and design as well as the substitute material itself convey the visual appearance of the remaining parts of the feature and finish.

3.4 Replace Deteriorated Historic Materials and Features

Following repair in the hierarchy, **Rehabilitation** guidance is provided for ***replacing*** an entire character-defining feature with new material because the level of deterioration or damage of materials precludes repair (for example, an exterior cornice; an interior staircase; or a complete porch or storefront). If the essential form and detailing are still evident so that the physical evidence can be used to re-establish the feature as an integral part of the rehabilitation, then its replacement is appropriate. Like the guidance for repair, the preferred option is always replacement of the entire feature in kind, that is, with the same material. Because this approach may not always be technically or economically feasible, provisions are made to consider the use of a compatible substitute material. It should be noted that, while the National Park Service guidelines recommend the replacement of an entire character-defining feature that is extensively deteriorated, they never recommend removal and replacement with new material of a feature that--although damaged or deteriorated--could reasonably be repaired and thus preserved.

3.5 Design for the Replacement of Missing Historic Features

When an entire interior or exterior feature is missing (for example, an entrance, or cast iron facade; or a principal staircase), it no longer plays a role in physically defining the historic character of the building unless it can be accurately recovered in form and detailing through the process of carefully documenting the historical appearance. Although accepting the loss is one possibility, where an important architectural feature is missing, its replacement is always recommended in the **Rehabilitation** guidelines as the first or preferred, course of action. Thus, if adequate historical, pictorial, and physical documentation exists so that the feature may be accurately reproduced, and if it is desirable to re-establish the feature as part of the building's historical appearance, then

designing and constructing a new feature based on such information is appropriate. However, a second acceptable option for the replacement feature is a new design that is compatible with the remaining character-defining features of the historic building. The new design should always take into account the size, scale, and material of the historic building itself and, most importantly, should be clearly differentiated so that a false historical appearance is not created.

3.6 Alterations/Additions for the New Use

Some exterior and interior alterations to a historic building are generally needed to assure its continued use, but it is most important that such alterations do not radically change, obscure, or destroy character-defining spaces, materials, features, or finishes. Alterations may include providing additional parking space on an existing historic building site; cutting new entrances or windows on secondary elevations; inserting an additional floor; installing an entirely new mechanical system; or creating an atrium or light well. Alteration may also include the selective removal of buildings or other features of the environment or building site that are intrusive and therefore detract from the overall historic character. The construction of an exterior addition to a historic building may seem to be essential for the new use, but it is emphasized in the **Rehabilitation** guidelines that such new additions should be avoided, if possible, and considered only after it is determined that those needs cannot be met by altering secondary, i.e., non character-defining interior spaces. If, after a thorough evaluation of interior solutions, an exterior addition is still judged to be the only viable alterative, it should be designed and constructed to be clearly differentiated from the historic building and so that the character-defining features are not radically changed, obscured, damaged, or destroyed. Additions and alterations to historic buildings are referenced within specific sections of the Rehabilitation guidelines such as Site, Roofs, Structural Systems, etc., but are addressed in detail in New Additions to Historic Buildings.

3.7 Energy Efficiency/Accessibility Considerations/Health and Safety Code Considerations

These sections of the guidance address work done to meet accessibility requirements and health and safety code requirements; or retrofitting measures to improve energy efficiency. Although this work is quite often an important aspect of **Rehabilitation** projects, it is usually not a part of the overall process of protecting or repairing character-defining features; rather, such work is assessed for its potential negative impact on the building's historic character. For this reason, particular care must be taken not to radically change, obscure, damage, or destroy character-defining materials or features in the process of meeting code and energy requirements.

4. REHABILITATION GUIDELINES

These guidelines deal with the following components of heritage resources:

- Masonry
- Wood
- Architectural metals
- Roofs
- Windows
- Entrances and porches
- Interior structural systems
- Interior spaces, features, finishes
- Interior mechanical systems
- Site
- Setting

4.1 Exterior materials

4.1.1 Masonry

Repair

Recommended

Repairing, stabilizing, and conserving fragile masonry by using well-tested consolidants, when appropriate. Repairs should be physically and visually compatible and identifiable upon close inspection for future research.

Repairing masonry walls and other masonry features by repointing the mortar joints where there is evidence of deterioration such as disintegrating mortar, cracks in mortar joints, loose bricks, damp walls, or damaged plasterwork.

Removing deteriorated mortar by carefully hand-raking the joints to avoid damaging the masonry.

Duplicating old mortar in strength, composition, colour, and texture.

Duplicating old mortar joints in width and in joint profile.

Repairing stucco by removing the damaged material and patching with new stucco that duplicates the old in strength, composition, colour, and texture.

Using mud plaster as a surface coating over unfired unstabilized adobe because the mud plaster will bond to the adobe.

Cutting damaged concrete back to remove the source of deterioration (often corrosion on metal reinforcement bars). The new patch must be applied carefully so it will bond satisfactorily with, and match, the historic concrete.

Repairing masonry features by patching, piecing-in, or otherwise reinforcing the masonry using recognized preservation methods. The new work should be unobtrusively dated to guide future research and treatment.

Applying new or non-historic surface treatments such as water-repellent coatings to masonry only after repointing and only if masonry repairs have failed to arrest water penetration problems.

Not Recommended

Removing masonry that could be stabilized, repaired and conserved; or using untested consolidants and untrained personnel, thus causing further damage to fragile materials.

Removing nondeteriorated mortar from sound joints, then repointing the entire building to achieve a uniform appearance.

Using electric saws and hammers rather than hand tools to remove deteriorated mortar from joints prior to repointing.

Repointing with mortar of high Portland cement content (unless it is the content of the historic mortar). This can often create a bond that is stronger than the historic material and can cause damage as a result of the differing coefficient of expansion and the differing porosity of the material and the mortar.
Repointing with a synthetic caulking compound.

Using a "scrub" coating technique to repoint instead of traditional repointing methods. Changing the width or joint profile when repointing.

Removing sound stucco; or repairing with new stucco that is stronger than the historic material or does not convey the same visual appearance.

Applying cement stucco to unfired, unstabilized adobe. Because the cement stucco will not bond properly, moisture can become entrapped between materials, resulting in accelerated deterioration of the adobe.

Patching concrete without removing the source of deterioration.

Removing masonry that could be repaired, using improper repair techniques, or failing to document the new work.

Applying waterproof, water repellent, or non-historic coatings such as stucco to masonry as a substitute for repointing and masonry repairs. Coatings are frequently unnecessary, expensive, and may change the appearance of historic masonry as well as accelerate its deterioration.

<u>Limited Replacement in Kind</u>

Recommended

Replacing in kind extensively deteriorated or missing parts of masonry features when there are surviving prototypes such as terra-cotta brackets or stone balusters. The new work should match the old in material, design, colour, and texture; and be unobtrusively dated to guide future research and treatment.

Not Recommended

Replacing an entire masonry feature such as a column or stairway when limited replacement of deteriorated and missing parts is appropriate.

Using replacement material that does not match the historic masonry feature; or failing to properly document the new work.

4.1.2 Wood

Repair

Recommended

Repairing, stabilizing, and conserving fragile wood using well-tested consolidants, when appropriate. Repairs should be physically and visually compatible and identifiable upon close inspection for future research.

Repairing wood features by patching, piecing-in, or otherwise reinforcing the wood using recognized preservation methods. The new work should be unobtrusively dated to guide future research and treatment.

Not Recommended

Removing wood that could be stabilized and conserved; or using untested consolidants and untrained personnel, thus causing further damage to fragile historic materials.

Removing wood that could be repaired, using improper repair techniques, or failing to document the new work.

Limited Replacement in Kind

Recommended

Replacing in kind extensively deteriorated or missing parts of wood features when there are surviving prototypes such as brackets, melding, or sections of siding. New work should match the old in material, design, colour, and texture; and be unobtrusively dated to guide future research and treatment.

Not Recommended

Replacing an entire wood feature such as a column or stairway when limited replacement of deteriorated and missing parts is appropriate.

Using replacement material that does not match the historic wood feature; or failing to properly document the new work.

4.1.3 Architectural metals

Repair

Recommended

Repairing, stabilizing, and conserving fragile architectural metals using well-tested consolidants, when appropriate. Repairs should be physically and visually compatible and identifiable upon close inspection for future research.

Repairing architectural metal features by patching, piecing-in, or otherwise reinforcing the metal using recognized preservation methods. The new work should be unobtrusively dated to guide future research and treatment.

Not Recommended

Removing architectural metals that could be stabilized and conserved; or using untested consolidants and untrained personnel, thus causing further damage to fragile historic materials.

Removing architectural metals that could be repaired, using improper repair techniques, or failing to document the new work.

Limited Replacement in Kind

Recommended

Replacing in kind extensively deteriorated or missing parts of architectural metal features when there are surviving prototypes such as porch balusters, column capitals or bases, or porch cresting. The new work should match the old in material, design, and texture; and be unobtrusively dated to guide future research and treatment.

Not Recommended

Replacing an entire architectural metal feature such as a column or balustrade when limited replacement of deteriorated and missing parts is appropriate.

Using replacement material that does not match the historic metal feature; or failing to properly document the new work.

4.2 Exterior features

4.2.1 Roofs

Repair

Recommended

Repairing a roof by reinforcing the historic materials that comprise roof features using recognized preservation methods. The new work should be unobtrusively dated to guide future research and treatment.

Not Recommended

Removing materials that could be repaired, using improper repair techniques, or failing to document the new work.

Failing to reuse intact slate or tile when only the roofing substrate needs replacement.

Limited Replacement in Kind

Recommended

Replacing in kind extensively deteriorated or missing parts of roof features or roof coverings when there are surviving prototypes such as cupola louvers, dentils, dormer roofing; or slates, tiles, or wood shingles on a main roof. The new work should match the old in material, design, colour, and texture; and be unobtrusively dated to guide future research and treatment.

Not Recommended

Replacing an entire roof feature such as a cupola or dormer when limited replacement of deteriorated and missing parts is appropriate.

Using material for the replacement material that does not match the historic roof feature; or failing to properly document the new work.

4.2.2 Windows

Repair

Recommended

Repairing window frames and sash by patching, piecing-in, consolidating or otherwise reinforcing them using recognized preservation methods. The new work should be unobtrusively dated to guide future research and treatment.

Not Recommended

Failing to protect the historic glazing when repairing windows.

Removing material that could be repaired, using improper repair techniques, or failing to document the new work.

Failing to reuse serviceable window hardware such as brass sash lifts and sash locks.

Limited Replacement in Kind

Recommended

Replacing in kind extensively deteriorated or missing parts of windows when there are surviving prototypes such as frames, sash, sills, glazing, and hoodmolds. The new work should match the old in material, design, colour, and texture; and be unobtrusively dated to guide future research and treatment.

Not Recommended

Replacing an entire window when limited replacement of deteriorated and missing parts is appropriate.

Using replacement material that does not match the historic window; or failing to properly document the new work.

4.2.3 Entrances and porches

Repair

Recommended

Repairing entrances and porches by reinforcing the historic materials using recognized preservation methods. The new work should be unobtrusively dated to guide future research and treatment.

Not Recommended

Removing material that could be repaired, using improper repair techniques, or failing to document the new work.

Limited Replacement in Kind

Recommended

Replacing in kind extensively deteriorated or missing parts of repeated entrance and porch features when there are surviving prototypes such as balustrades, cornices, entablatures, columns, sidelights, and stairs. The new work should match the old in material, design, colour, and texture; and be unobtrusively dated to guide future research and treatment.

Not Recommended

Replacing an entire entrance or porch feature when limited replacement of deteriorated and missing parts is appropriate.

Using replacement material that does not match the historic entrance or porch feature; or failing to properly document the new work.

4.3 INTERIOR FEATURES

4.3.1 Structural systems

Repair

Recommended

Repairing the structural system by augmenting or upgrading individual parts or features using recognized preservation methods. For example, weakened structural members such as floor framing can be paired with a new member, braced, or otherwise supplemented and reinforced.

Not Recommended

Upgrading the building structurally in a manner that diminishes the historic character of the exterior, such as installing strapping channels or removing a decorative cornice; or damages interior features or spaces.

Replacing a structural member or other feature of the structural system when it could be augmented and retained.

Limited Replacement in Kind

Recommended

Replacing in kind those visible portions or features of the structural system that are either extensively deteriorated or missing when there are surviving prototypes such as cast iron columns and sections of load bearing walls. The new work should match the old in materials, design, colour, and texture; and be unobtrusively dated to guide future research and treatment.
Considering the use of substitute material for unexposed structural replacements, such as roof rafters or trusses. Substitute material should, at a minimum, have equal load bearing capabilities, and be unobtrusively dated to guide future research and treatment.

Not Recommended

Replacing an entire visible feature of the structural system when limited replacement of deteriorated and missing portions is appropriate.

Using material for a portion of an exposed structural feature that does not match the historic feature; or failing to properly document the new work.

Using substitute material that does not equal the load bearing capabilities of the historic material or design or is otherwise physically or chemically incompatible.

4.3.2 Spaces, features, finishes

Repair

Recommended

Repairing historic interior features and finishes by reinforcing the materials using recognized preservation methods. The new work should match the old in material, design, colour, and texture; and be unobtrusively dated to guide future research and treatment.

Not Recommended

Removing materials that could be repaired, using improper techniques, or failing to document the new work.

Limited Replacement in Kind

Recommended

Replacing in kind extensively deteriorated or missing parts of repeated interior features when there are surviving prototypes such as stairs, balustrades, wood panelling, columns; or decorative wall coverings or ornamental tin or plaster ceilings. New work should match the old in material, design, colour, and texture; and be unobtrusively dated to guide future research and treatment.

Not Recommended

Replacing an entire interior feature when limited replacement of deteriorated and missing parts is appropriate.

Using replacement material that does not match the interior feature; or failing to properly document the new work.

4.3.3 Mechanical systems

Repair

Recommended

Repairing mechanical systems by augmenting or upgrading system parts, such as installing new pipes and ducts; rewiring; or adding new compressors or boilers.

Not Recommended

Replacing a mechanical system or its functional parts when it could be upgraded and retained.

Limited Replacement in Kind

Recommended

Replacing in kind those visible features of mechanical systems that are either extensively deteriorated or are prototypes such as ceiling fans, switchplates, radiators, grilles, or plumbing fixtures.

Installing a new mechanical system if required, so that it causes the least alteration possible to the building.

Providing adequate structural support for new mechanical equipment.

Installing the vertical runs of ducts, pipes, and cables in closets, service rooms, and wall cavities.

Installing air conditioning in such a manner that historic features are not damaged or obscured and excessive moisture is not generated that will accelerate deterioration of historic materials.

Not Recommended

Installing a visible replacement feature that does not convey the same visual appearance.

Installing a new mechanical system so that character-defining structural or interior features are radically changed, damaged, or destroyed.

Failing to consider the weight and design of new mechanical equipment so that, as a result, historic structural members or finished surfaces are weakened or cracked.
Installing vertical runs of ducts, pipes, and cables in places where they will obscure character-defining features.

Concealing mechanical equipment in walls or ceilings in a manner that requires excessive removal of historic building material.

Cutting through features such as masonry walls in order to install air conditioning units.

4.4 SITE

Repair

Recommended

Repairing features of the building and site by reinforcing historic materials using recognized preservation methods. The new work should be unobtrusively dated to guide future research and treatment.

Not Recommended

Removing materials that could be repaired, using improper repair techniques, or failing to document the new work.

Limited Replacement in Kind

Recommended

Replacing in kind extensively deteriorated or missing parts of the building or site where there are surviving prototypes such as part of a fountain, or portions of a walkway. New work should match the old in materials, design, colour, and texture; and be unobtrusively dated to guide future research and treatment.

Not Recommended

Replacing an entire feature of the building or site when limited replacement of deteriorated and missing parts is appropriate.

Using replacement material that does not match the building site feature; or failing to properly document the new work.

4.5 SETTING

Repair

Recommended

Repairing features of the building and landscape using recognized preservation methods. The new work should be unobtrusively dated to guide future research and treatment.

Not Recommended

Removing material that could be repaired, using improper repair techniques, or failing to document the new work.

Limited Replacement in Kind

Recommended

Replacing in kind extensively deteriorated or missing parts of building and landscape features where there are surviving prototypes such as porch balustrades or paving materials.

Not Recommended

Replacing an entire feature of the building or landscape when limited replacement of deteriorated and missing parts is appropriate.

Using replacement material that does not match the building or landscape feature; or failing to properly document the new work.

4.6 Health and safety considerations

Recommended

Identifying the historic building's character-defining spaces, features, and finishes so that code-required work will not result in their damage or loss.

Complying with health and safety codes, including seismic code requirements, in such a manner that character-defining spaces, features, and finishes are preserved.

Removing toxic building materials only after thorough testing has been conducted and only after less invasive abatement methods have been shown to be inadequate.

Providing workers with appropriate personal protective equipment for hazards found in the worksite.

Working with local code officials to investigate systems, methods, or devices of equivalent or superior effectiveness and safety to those prescribed by code so that unnecessary alterations can be avoided.

Upgrading historic stairways and elevators to meet health and safety codes in a manner that assures their preservation, i.e., so that they are not damaged or obscured.

Installing sensitively designed fire suppression systems, such as sprinkler systems that result in retention of historic features and finishes.

Applying fire-retardant coatings, such as intumescent paints, which expand during fire to add thermal protection to steel.

Adding a new stairway or elevator to meet health and safety codes in a manner that preserves adjacent character-defining features and spaces.

Placing a code-required stairway or elevator that cannot be accommodated within the historic building in a new exterior addition. Such an addition should be on an inconspicuous elevation.

Not Recommended

Undertaking code-required alterations to a building or site before identifying those spaces, features, or finishes which are character-defining and must therefore be preserved.

Altering, damaging, or destroying character-defining spaces, features, and finishes while making modifications to a building or site to comply with safety codes.

Destroying historic interior features and finishes without careful testing and without considering less invasive abatement methods.

Removing unhealthful building materials without regard to personal and environmental safety.

Making changes to historic buildings without first exploring equivalent health and safety systems, methods, or devices that may be less damaging to historic spaces, features, and finishes.

Damaging or obscuring historic stairways and elevators or altering adjacent spaces in the process of doing work to meet code requirements.

Covering character-defining wood features with fire-resistant sheathing which results in altering their visual appearance. Using fire-retardant coatings if they damage or obscure character-defining features.

Radically changing, damaging, or destroying character-defining spaces, features, or finishes when adding a new code-required stairway or elevator.

Constructing a new addition to accommodate code-required stairs and elevators on character-defining elevations highly visible from the street; or where it obscures, damages, or destroys character-defining features.

ADDENDUM D

Witbank Power Station

The Witbank Power Station was a base load station at a high load factor, principally with "duff" coal and coupled with its situation in the heart of the coalfields, enabled the Commission to provide power very cheaply to its consumers.

1. Turbulent beginnings

The first formal meeting of the Electricity Commission was held on 29 March 1923. According to the minutes of the meeting the transfer of the Colenso power station in Natal from the South African Railways, as well as the establishment of power stations at Durban, Cape Town and Witbank was discussed.

The establishment of the power station at Witbank proved to be difficult and almost lead to an open confrontation between Escom and the The Victoria Falls and Transvaal Power Co., Ltd. (Victoria Falls Power Company (VFP)). The minutes of the second formal meeting held on 18 May 1923 mentions a "confrontation" between the Commission and the VFP.

The VFP was founded in 1906 and registered in the then Southern Rhodesia. The idea was that the company would become a centralized provider of electricity. The VFP wanted to provide existing as well as future industries with power that would be generated at the Victoria Waterfall and the Zambezi River. Mine owners insisted that a coal-fired power station also be built on the Reef for use in the event of power failures. The idea of harnessing the hydro-potential of the Zambezi River was soon abandoned for technical and financial reasons and therefor the VFP decided to erect steam driven power stations close to the user area, with fuel obtained from the Transvaal coalfields.

In accordance with the Power Act of 1910 the VFP wanted to establish a power station in the Witbank area. This area was ideally suited for such an undertaking: the principal coalfields in the Transvaal were in the Witbank area, there is an abundance of water, which is an important factor to consider in the establishment of thermal power stations. Such a power station would be in close proximity of the Witwatersrand gold fields, which would be the main power users. Furthermore it was hoped that the establishment of a power station in that area would encourage development in that part of the country.

In May 1923 the VFP applied to the Electricity Control Board for an extension of its license to the Witwatersrand. The Commission had already started an examination of the power potentialities in the Witbank area and therefor opposed such an extension. The Prime Minister, gen. Jan Smuts realized the seriousness of the situation and asked CH Merz, a world renown consulting engineer, to mediate between the two parties. A compromise was reached, dated 5 July 1924. According to the agreement the VFP would construct and operate the power station at cost price for and on behalf of and in collaboration with the Commission. After a period of twelve months it would be decided if the commission would take over the operation and working of the station or allow the VFP to continue to operate it on the Commission's behalf. The Commission would finance and own the station. All land servitudes and other rights acquired were registered in the Commission's name.

In the Annual Report of 1925 reasons were given for permitting the VFP to construct the power station on behalf of the Commission. These included the fact that the Company was in

a better situation that the Commission to start work immediately, since the Electricity Control Board had approved many of the plans and specifications. [1] Given the urgent need for additional power on the Rand, this was the only workable option. Whereas the VFP already received its license on 21 July 1924, the Commission was granted its license to operate in the Witbank area only on 6 April 1925.

In the Annual Report of 1924 it is mentioned that a gratifying feature of the settlement reached was that the interests of both parties have been satisfied. In the commemorative issue of 1948 the agreement between these two parties is described as cordial which serves as an example of the good co-operation that the Commission had with other undertakings. The agreement ensured that consumers would enjoy the benefits of a large and up-to-date power station with a guarantee of one-half share in any saving to the VFP resulting from the erection and operation of the Witbank Power Station. Mines, entering into new contracts with the VFP, were guaranteed a 15% discount on standard prices from January 1923, rising to 17.5% on the date the Witbank Power Station came into full operation.

2. Site

The power station was situated on a site approximately 10 000 ha, which covered the farms "Witbank" No. 141 and "Joubertsrus" No. 554. According to the agreement this site, as well as all apparatus for generating and delivering, transforming, switching and metering electricity; the buildings, works and machinery and the transmission and distribution lines, cables and sub-stations were owned by the Commission. The Commission could use, by arrangement, the transmission and distribution systems of the VFP and the Rand Mines Power Supply Company. Furthermore the Commission could alter or enlarge any part of the undertaking, provided that the generated capacity did not exceed 120 000 kilowatts.

2.1 Area of provision

The Commission was licensed to provide electricity to an area within a radius of 24 km from the generating station; the South African Railways and Harbors' property within a radius of 160 km from Witbank Railway Station and property outside the 160 km radius that formed part of the main line between Witbank and the Mozambique border at Komatipoort. With the amendment of the license the area was enlarged to a radius of 25 miles in and around Witbank.

2.2 Amendment of Witbank Licence 1925

When the Commission made its application for a licence to the Electricity Control Board in 1925, it was not known what consumers would be obtained. Therefore the layout of the local distribution system could not be determined and prices for the supply of electricity could not

[1] The young Escom organization was able to learn a lot from the VFP as to the design, erection and operation of power stations. By 1915 the VFP had already erected four power stations at Brakpan, Simmerpan, Rosherville and Vereeniging. The Vereeniging power station was the first in the country to be built on colliery, heralding the way for the large power stations. The work of the VFP was significant in the fact that a centralized power undertaking, based on the exploitation of the country's coal resources, was successfully brought into operation. Furthermore the VFP pioneered long distance transmission at high voltages under the varying climatic conditions of the Witwatersrand.

be fixed. After the distribution system came into operation, the Commission was in a position to submit standard prices and application was accordingly made to the Board on the 21 March 1927 for the amendment to the Witbank Licence. These amendments were granted on 29 June 1927. Further amendments to the licence were made over the years as more consumers were obtained.

2.3 Contracts

See appendix A for a complete list of contracts awarded. (Annual reports 1925, 1926)

Almost all steelwork for the coal staithes was imported, as well as an engine room crane, a considerable quantity of boiler house material, including sections for three boilers, headers for superheaters, mud drums, superheater tubes, economiser casings and dam pumps and piping for the pipe line from the dam to the station.

2.4 Site works

2.4.1 Electricity generation

At first the station consisted of three sets, each with a capacity of 23 500 kV on maximum continuous rating. The aggregate capacity of the main generating plant would be 70 500 kV. Electricity was generated by three main turbo-generator sets of 20 000 kW each at a frequency 50 periods per second and a pressure of 6 600 V. The station also contained and auxiliary set of 1 000 kW capacity. The pressure was increased to 132 000 V for transmission to the Witwatersrand, while 22 000 V was used in the Witbank area. The station was equipped with twelve boilers, each with a normal capacity of 30 600 kg of steam per hour. The boiler house and the generating sets were housed in a steel frame building.

The first 20 000 kW set was started up provisionally on 3 May 1926, the second on 15 July and the third on 25 October of the same year. In 1926 the power requirements of the VFP on the Witwatersrand as well as consumers in the Witbank area increased to such an extent that a fourth 20 000kW generating set and three additional boilers were constructed, bringing the installed capacity of the generating plant up to 80 000 kW. The Undertaking was placed in commercial operation on 1 July 1927. On completion in 1927 the Witbank Power Station was the largest of the Commission's stations.

Due to the increased power requirements of the VFP on the Witwatersrand, and in order to maintain the full output of 80 000 kW during periods when one of the four 20 000 kW set was out of commission for overhaul or otherwise, it was decided to extend the power station by installing a fifth 20 000 kW set and one additional boiler. This brought the installation up to 100 000 kW and sixteen boilers.

Feedheating was introduced at Witbank Power Station in 1926, where each of the 20-MW sets had a low-pressure feedheater operating on steam bled from the turbine and high-pressure feedheating from the feedpump exhausts.

Railway siding from Witbank Railway Station and permanent sidings on the site were built as well as coal staithes which provide storage capacity to supply fuel to the power station over periods when the colliery was shut down.

2.4.2 Cooling system

An important feature of thermal power stations is the need for water to produce steam to drive the prime movers, condensing the turbine-exhaust steam and cooling the bearing and generator coolers.[2] At Rosherville and Simmerpan the water was circulated round an open dam, where it lost its heat to the atmosphere. At Witbank spray-pond cooling was used.[3] The necessary water rights were obtained from the Water Court, all servitude registered in the Commission's name. A dam was constructed across the Great Olifants River on the farm "Doornpoort". The dam had a capacity of 170 cubic metres. From the dam water was pumped over a distance of 7,2 km to a high-level service reservoir on the farm "Joubertsrust". From the reservoir water was gravitated for a distance of 1,2 km to the generating station. Mass excavations for two cooling ponds on the site of the station started in 1925. It was estimated that 5 000 kilolitre of water per day were required for boiler feed circulating and general station purposes.[4]

2.4.3 Transmission

The VFP erected on its own account a 112 km double-circuit 132 kV transmission line from Witbank to its generating station at Brakpan, where it linked up with the Company's main distribution system along the Reef.[5]

---

[2] Approximately 60% of the heat energy supplied to the prime mover cannot be converted into electrical energy and must be rejected as low-grade heat in the condenser. The steam is condensed on tubes through which cooling water flows, which raises the temperature of the cooling water, which in turn has to be cooled.

[3] The first cooling towers were constructed for Klip Power Station in 1940.

[4] Even before the erection of the Witbank Power Station the Witbank Municipality had difficulty with its water supply. The problem became so acute in 1925 that the Commission stepped in and provided the Municipality with water from its reservoir. This was at first only a temporary measure, but later it was agreed that, subject to the necessary rights being obtained from the Water Court, the Commission would store in and pump from its dam on the Great Elephants River a supply of water at the Commission's service reservoir near the power station site. The Municipality undertook the reticulation of the water to its consumers in the Township. The dam had to be raised to provide the necessary additional storage. The Municipality's new water scheme was formally opened on 9 January 1929.

[5] If a fault occurred on the double circuit Witbank-Brakpan lines it was not possible to tell whether the fault was on the south or the north circuit and clockwork-driven relays were built which first switched out the one circuit at both ends and then reclosed it after a delay of about one second and if the fault was still on did the same to the second line. Often this cycle had to be repeated if there was a permanent fault on one line. The behaviour of the lines was studied by taking a cine film at each terminal of a battery of ammeters, which indicated the current in each of the six line conductors at each end when a fault occurred. These were then developed and studied by the Control Centre and the Electrical Test Division to determine the pattern of the fault behaviour and so improve the functioning of the protection. It was found that the North line faulted more often than the South line and that one in five faults involved both lines. With this cyclic switching, synchronism between Witbank and Simmerpan, where the control room was situated, was practically never lost even during double-line faults.

A 380/220 V distribution system in the Witbank Municipal area consisted mainly of overhead lines for the distribution of electricity to all residential and other consumers within the township as well as for street lighting purposes, which started in August 1927. In the Witbank district the Commission had a 21.000 V reticulation system, consisting of 13 km of underground cables and 20 km of overhead lines transmitting electricity to sub-stations situated in the Witbank Township and on the respective consumers' premises. This network was placed in commercial operation on 1 January 1928.

2.5 Staff quarters

Due to the lack of accommodation for the operating staff in the Witbank Township, a large housing programme was started in 1925. In the residential area for Europeans houses were built for the Resident Engineer, the Assistant Resident Engineer as well as a rest house, a boarding house and housekeeper's quarters, three blocks of eight single quarters and 20 married quarters completed houses. In 1926 two additional married quarters and a block of twelve-roomed single quarters were constructed.

A compound was built for the black workers. In 1930 there were 300 blacks living in the compound. According to the housing records the management preferred that they did not live in the municipal area, but in the compound where they could be under strict control of the compound clerk, the police corporal and an induna, for who married quarters were constructed in 1930. It was required of the police corporal to make periodical checks, day and night, of the police boys on duty to ensure that they were at their posts.

The married quarters for black workers were built according to standards set by the Government. It consisted of a rectangular brick building which was plastered and painted. The building was damp proofed and provision was made for gutters over the doors, storm drains and sewerage. The windows were half-opening. The clothing line and the ablution were not communal and houses were equipped with one shower with hot water. The kitchen had a sink, also with hot water and one fireplace. The municipality provided drinking water. In the case of government housing projects adequate funds were not provided to comply with these standards. Whether this was the case with the Escom housing scheme is not known.

3. Staff

The staff of the Witbank Power station was not employed by the Commission, but by the VFP on behalf of the Commission. This changed in 1948 when Escom took over the VFP undertaking.

Bernard Marchand 1895-1972

Mr Marchand was appointed as Engineer on 1September 1926 at Witbank undertaking of which the construction had only commenced. He retired on 31 December 1965 as Manager of the East Transvaal Undertaking. One of the crowning moments of his career was the construction of the 400kV-power network from the Eastern Transvaal to Beaufort West in the Cape. Even though it was only completed in 1969, Mr Marchand was one of the principal players in the development of this delivery system.

In his tribute to Mr Marchand, Mr JS van Velden mentions his modesty and ability to communicate with people from all walks of life. He was also many faceted - he built his own telescope and had a lively interest in developments in space travel.[6] In the 3rd edition of Megawatt in 1966 an article titled *Die "Chief" kom terug* appeared which amused Mr Marchand greatly. He loved woodwork and would collect used poles at the depot. A new staff member who did not know him remarked to one of his colleagues that it is amazing that a person with such a low ranked position could afford a Mercedes Benz.

4. Consumers

4.1 The Victoria Falls Power Company

The Commission's most important consumer was the VFP. The bulk of the output was taken by the VFP for supply to gold mines, industries and towns along the Witwatersrand. In terms of the arrangement made between the Commission and the VFP the Company, subject to certain limitations, was required to take all the electricity that could be generated at the Witbank Power station, after meeting the requirements of the Commission's consumers in the Witbank district. In June 1931 negotiations were undertaken for the extension of the Commission's distribution system to outlying portions of the Witbank Municipal Area. In the Annual Report of 1936 it is noted that the residential consumers included people of all classes.

4.2 Industrial consumers

Apart from the local residential consumers, the Witbank Power station also had industrial consumers in the area. In the Annual Report of 1926 it is mentioned that a large industrial consumer had transferred its works to Witbank to obtain the benefits of the cheap power available. During the same year four colliery companies also decided to take supplies of electricity from the Undertaking and negotiations with other prospective consumers in the Witbank District had already started. 1929 connected nine collieries in the Witbank District up to the power station. At the end of 1936 all producing collieries in the Witbank district were consumers of the Commission.

Consumers included the following: The Rand Carbide, Ltd. (Supply commenced December 1926); Witbank Colliery, Ltd. (May 1927); S.A. Coal Estates (Witbank), Ltd. (Navigation Colliery) (July 1927); Middelburg Steam Coal and Coke Company, Ltd. (October 1927) and Coronation Collieries, Ltd (Kromdraai Colliery) (December 1927); Tweefontein United Collieries, Ltd. (Negotiations completed end 1927).

As the demand for power increased, the standard tariff was reduced.[7]

---

[6] *Megawatt* no24 1972, Stigter en bouer van 'n onderneming heen, p.9

[7] With effect from January 1929 the tariff consisted of a charge of £25 per annum, payable in advance; a charge of £5.5s for each kV of the maximum demand supplied in each year; and a charge of 0.05d for each unit supplied. Compared to 1927 it was a reduction of £0.7s per kV and 0.01d for each unit supplied and a further reduction was made with effect from July 1929.

4.3 Electrification of the railway system along the Witwatersrand

An important development was the supply of electricity to the South African Railways and harbours Administration for the electrification of the railway system along the Witwatersrand and from Germiston to Pretoria in 1935. Twelve sub-stations, equipped with mercury and rectifiers were planned to supply the direct current required for traction purposes. The electrification of the railway started in 1940, but the outbreak of the Second World War seriously hampered this development and it was only in 1946 that the substation at Elandsfontein started commercial operation.

4.4 Agricultural consumers

The Witbank Power Station also provided electricity to farming schemes, the first area being in the Elephants River area in the Groblersdal district. After the Second World War electricity provision to agriculture increased substantially. Areas provided by the Witbank Power Station included the Elands River scheme north west of Marble Hall and farms in the Ermelo, Nelspruit, Bronkhorstspruit, Bethal, Leslie, Balmoral, Carolina, Kendal, Hendrina, Koornfontein and Morgenson districts. Electricity was mainly used to power irrigation schemes, but the Forestry nursery at Belfast, a fruit-packing firm at Kiepersol. The Kruger National park and Loskop Dam holiday resort also made use of power from the Witbank Power Station. In 1964 alone 127 farms and 59 other rural users were added to the Eastern Transvaal Undertaking.

5. Decommissioning of the power station

With the construction of the Wilge, Komati, Camden, Hendrina, Arnot, Kriel and Grootvlei power stations the Witbank power station was used less. The last time it is mentioned in an annual report is in 1963 and in 1970 all operations ceased. The building at Witbank was still used as the headquarters of the Eastern Transvaal Operation.

Timeline

1926 Feedheating in introduced at Witbank Power Station, where each of the 20-MW sets has a low-pressure feedheater operating on steam bled from the turbine and high-pressure feedheating from the feedpump exhausts.

Chairman: Dr HJ van der Bijl (1923-1948)

1931 The output decreased by 15,295,245 units, which represented 2,5%. This reduction was due to loading conditions, which affect the machine load factors being less favourable and the fact that sufficient quantities of 'duff' coal had not been available, necessitating the purchase and crushing of large coal, with affected coal grading. [8]

1934 4 70/80 000 pound (steam per hour) steam kettles installed

1935 No extensions of a major character were undertaken, but the transmission and distribution systems were extended. Grit extractors were installed on two of the original boilers. The output of the Undertaking increased by approximately 80 million units over the previous year.
Arrangements are being made to supply the South African Railways and Harbours Administration for the electrification of the railway system along the Witwatersrand and between Germiston and Pretoria. The Witbank Power Station will be used as the main source of power.

1937 42 new connections were made to the system, bringing the total number of consumers to 635.
The Reef railway electrification scheme is completed in March of this year.

1939 An extensive overhaul programme was undertaken. Some of the alternator stations had to be replaced and for some time the turbo-alternators were out of service.

1940 electrification of the Reef railway system started 1940. Delayed because of difficulties resulting from the war.

Second World War period

Increase in the demand for South African coal for bunkering and export purposes during the war resulted in a steep rise in the output of the existing collieries and the opening up of several new shafts. Additional power was required and the 21 kV distribution network was strengthened to cater for the heavier loading and to extend the system to the new collieries. For these lines locally manufactured steel poles was used.

[8] It was only in the early 1960's that Escom started using pulverizing mills to crush the coal. Medium and slow-speed mills, which operate under either suction of pressure, are used.

Post World War period

1945 Substation at Elandsfontein (Reef Railway electrification) was completed and commenced operation in April 1946.

The post Second World War period

This period was characterised by the rapid expansion of operations not only in the Witbank district, but also the Eastern Transvaal. Between 1948 and 1949 alone the number of consumers grew from 1388 to 1551. The consumers were mostly collieries, but included towns such as Bethal, Bronkhorstspruit, Ermelo, Carolina and Breyten. Due to the increase in demand new facilities (feeders, distribution systems, generators, dams, and offices) had to be constructed. Power failures were also experienced during the winter of 1951.

It was also in this period that the most accidents occurred; though the Witbank plant, on the whole, had one of the best safety records of the Commission. In 1952 a 21 kV circuit breaker was destroyed at Rand Carbide. The roof of the plant collapsed, but no serious power failure was experienced. At the Witbank Municipal sub-central a similar circuit breaker was destroyed in an explosion and the town of Witbank was without power for 8 hours.

1948 It is announced that the Commission will buy the electricity undertaking from the VFP, effective from 1 July 1948. The transaction is financed by a public loan of R30 million. The delivery area serviced through this agreement stretches from Witbank in the Transvaal to Winburg in the Free State and comprises of on of the biggest existing grit systems. The assets taken over included the power stations at Rosherville, Simmerpan, Vereeniging and Brakpan; compressed-air installations; almost 60 km of air pipe line; approximately 2 094 km of transmission lined; 1 138 km of pilot and telephone lines; 12 large and six small distribution stations; equipment in 304 consumer substations; 918 transformers.

Chairman: Mr AM Jacobs (1948-1952)
Dr JT Hattingh (1952-1962)

1954 After the Second World War the mining activities increased due to the demand for uranium. To provide adequate power for this, the Wilge Power Station as constructed near Kendal, in the Transvaal and commissioned in July 1954.

Due to the expansion of the undertakings in the Eastern Transvaal, the name was changed in 1954 to the Eastern Transvaal Undertaking. At that stage the Witbank Power Station was still the biggest producer of electricity, but a yearly decrease in production can be seen. Only a year after the Komati Power Station started, its power production already exceeded that of Witbank by 4 million units.

1962 Komati is commissioned
The Commission requested an enlargement of its licensed delivery area to include areas around Nelspruit, Witrivier and Barberton as well as an extensive area around Phalaborwa. This was mainly to provide electricity to mines in these areas.

Chairman: Dr RL Strazacker

1970 The Witbank Power Station ceases operation

1966 While Komati was still under construction; work was started at Camden Power Station. The first set at Camden was commissioned in December 1966.

1969 Before Camden had been complete, work started on Grootvlei

1970 The first set of the Hendrina Power station is commissioned and the last set in 1978.

1971 The first set at Arnot is commissioned, with the last set commissioned in 1975.

Kriel would be one of the largest stations in the Southern Hemisphere.

Sources

Escom Annual Reports 1924 – 1971
Megawatt Journals
"Vyf-en-twintig jaar" 1923-1948
Golden Jubilee 1923-1973
National Archives TAB 496907211
TAB NAB C1122
TAB 496866096

Appendix A: Contracts awarded

Babcock & Wilcox, Ltd.	Power station boilers and boiler house accessories, pipework and pumps, steel buildings and coal and ash handling plants
CA Parsons & Co., Ltd.	Steam turbines, generators, condensing plant and water cooling plant.
Metropolitan-Vickers Electrical Co., Ltd.	Transformers and power station switchgear and accessories.
Alexander Jack & Co., Ltd.	Overhead travelling crane
Drysdale & Co., Ltd.	Vertical spindles pumps and motors.
J.Blakeborough & Sons, Ltd.	Valves, penstocks and fittings for pump house.
Paterson Engineering Co.	Filtration plant for domestic water
Stewarts & Lloyds, Ltd.	Water piping, valves, etc.
British Mannesmann Tube Co, Ltd.	Poles for overhead transmission lines from generating station to pump house at dam
The Baughan Crane Co.	Crane for pump house
A Stuart, Germiston	Construction of dam, gauging weir, pump house, residential buildings, excavations, foundations, drainage system, cooling ponds and service reservoir and laying of pipeline
A Bradbury & Co., Pietermaritzburg	Construction of railway siding from Witbank Station to power station sites.

ADDENDUM E

GLOSSARY OF TERMS USED IN THIS DOCUMENT

Conservation: The act of maintaining all or part of a resource (whether renewable or non-renewable) in its present condition in order to provide for its continued or future use. Conservation includes sustainable use, protection, maintenance, rehabilitation, restoration and enhancement of the natural and cultural environment.

Development: A process for improving human well being through a reallocation of resources that involves some modification of the environment. It addresses basic needs, equity and the redistribution of wealth. Its focus is on the quality of life rather than the quantity of economic activity.

Empowerment: A process of acquiring skills, knowledge and confidence enabling individuals and communities to overcome obstacles, gain access to resources and opportunities and make their own informed choices in order to improve their quality of life.

Environmental Audit: A systematic, documented, regular and objective evaluation to see how well an organisation or facility is operating in terms of its Environmental Management System (EMS), and is complying with statutory requirements and the organisation's environmental policy.

Environmental Impact Assessment (EIA): A detailed study of the environmental consequences of a proposed course of action. An environmental assessment or evaluation is a study of the environmental effects of a decision, project, undertaking or activity. It is most often used within an Integrated Environmental Management (IEM) planning process as a decision support tool to compare different options.

Environmental Management System (EMS): Documented procedures drawn up as described in a South African Bureau of Standards (SABS) code of practice to implement the requirements of ISO 14000. Operating, emergency, data collection and documentation procedures are set out, along with procedures for training, the transfer of information and all the elements of a complete management and quality control system.

Ex-Situ Conservation: The conservation of components of biodiversity or cultural resources off-site, or outside their natural and original surroundings.

Heritage: Is the sum total of sites of geological, zoological, botanical and historical importance, national monuments, historic buildings and structures, works of art, literature and music, oral traditions and museum collections and their documentation that provides the basis for a shared culture and creativity in the arts.

Heritage impact assessment (HIA): The process of mapping, recording, assessing the significance, assessing the impacts of developments, recording consultations with interested and affected parties and recommending mitigatory actions

Heritage resources: The various natural and cultural assets that collectively form the heritage. These assets are also known as cultural and natural resources.

Heritage resource management: A process that consists of a range of interventions and provides a framework for informed and value-based decision-making. It integrates professional, technical and administrative functions and interventions that impact on cultural resources. Activities include planning, policy development, monitoring and assessment,

auditing, implementation, maintenance, communication, and many others. All these activities are (or will be) based on sound research.

Holism: The term holism is derived from the Greek *holos*, meaning complete, integrated. Holism is a worldview that sees all things as interconnected and getting their meaning mainly from the connections with other things.

In-Situ Conservation: The conservation and maintenance of ecosystems, natural habitats and cultural resources in their natural and original surroundings.

Integrated Environmental Management (IEM): A code of practice ensuring that environmental considerations are fully integrated into the management of all activities in order to achieve a desirable balance between conservation and development.

Interested and affected parties: People and groups concerned with an activity and its consequences.

Maintenance: Keeping something in good health or repair.

Museum: An institution which protects and uses movable and immovable, tangible and intangible elements of the natural and cultural heritage (i e natural and cultural resources) for purposes of conserving this heritage, and for education, research, tourism and recreation.

Natural resources: Naturally occurring assets like minerals, water, energy and living organisms that can be used to meet an economic want.

Plan: A formulated and especially detailed method by which a thing is to be done, in other words, a design or scheme. It can also be interpreted as an intention or proposed proceeding.

Policy: The activity preceding the publication of a goal. A policy statement is the making known the formal articulation, the declaration of intent, or the publication of a goal to be pursued. Policy is a desired course of action and interaction that is to serve as a guideline in the allocation of resources necessary to realise goals and objectives.

Preservation: Conservation activities that consolidate and maintain the existing form, material and integrity of a cultural resource.

Principle: A general or fundamental truth.

Programme: A plan of future events.

Project: A planned undertaking, a plan or scheme.

Reconstruction: Re-erecting a structure on its original site using original components.

Rehabilitation: Re-using an original building or structure for its historic purpose or placing it in a new use that requires minimal change to the building or structure characteristics and its site and environment.

Replication: The act or process of reproducing by new construction the exact form and detail of a vanished building, structure, object, or a part thereof, as it appeared at a specific period.

Restoration: Returning the existing fabric of a place to a known earlier state by removing additions or by reassembling existing components.

Social resources: People, their knowledge, skills, capacities, cultures and technologies, organisational and institutional structures, political and economic systems.

Sustainability: The ability of an activity to continue indefinitely, at current and projected levels, without depleting social, financial, physical and other resources required to produce the expected benefits.

Sustainable development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable tourism (development) (principle): tourism development management and any other tourism activity which optimise the economic and other societal benefits available in the present without jeopardising the potential for similar benefits in the future

Terms of reference: Guidelines and directives that keep the project on track, give direction, structure and uniformity, and act as a reference point against which progress can be monitored.

Tourism is the business of attracting visitors to sites, places and areas varying in geographic extent, and catering to their needs and expectations

Translocation: Dismantling a structure and re-erecting it on a new site using original components.

ADDENDUM F

INFORMATION SOURCES USED IN COMPILING THIS DOCUMENT

1. Unpublished documents

Eskom Park Master Plan, 1998. Unpublished document produced by Esprop, Megawatt Park.

Witbank Power Station. Unpublished research report produced by the Eskom Heritage Office.

2. Literature

AUSTRALIA ICOMOS, 2000, *The Burra Charter. The Australia ICOMOS Charter for places of cultural significance 1999. With associated guidelines and Code on the ethics of co-existence*. Melbourne: Australia ICOMOS.

CANADA ICOMOS *Charter for the Protection and Enhancement of the Built Environment (Appleton Charter)* (1983)

Electricity, the spirit of progress, 1933. Johannesburg: Eskom.

Empowering the nation, 2000 (Eskom history).

HARRISON, R, 1994, *Manual of heritage management*. Oxford: Butterworth Heinemann.

National Heritage Resources Act, Act 25 of 1999

NEW ZEALAND ICOMOS *Charter for the Conservation of Places of Cultural Heritage Value* (1992)

Standard Encyclopedia of Southern Africa, Vol 11. Cape Town: Nasou, 1975.

3. Internet sources

US NATIONAL PARK SERVICE, 2001, *Standards for the preservation and rehabilitation of historic buildings*. Available on the website http://www.nps.gov

UNESCO WORLD HERITAGE CENTRE http://www.whc.unesco.org

4. Pictorial sources

Aerial photographs: 1943, 1976, 1991

Eskom archives, Megawatt Park:

Photo album of Witbank power station
Collection of loose photographs of Witbank power station
Slides of Witbank power station

5. Oral sources

Mr Norman Bladwell, pensioner, Witbank (worked at the power station 1963-1965

ESCOM * WITBANK POWER STATION * HISTORICAL PHOTOGRAPHS

ADDENDUM G

COMPILATION OF HISTORICAL PHOTOGRAPHS OF THE WITBANK POWER STATION

PLATES 1-21

Note
Captions in the compilation follow captions of photographs if available, with added text in brackets [ ].

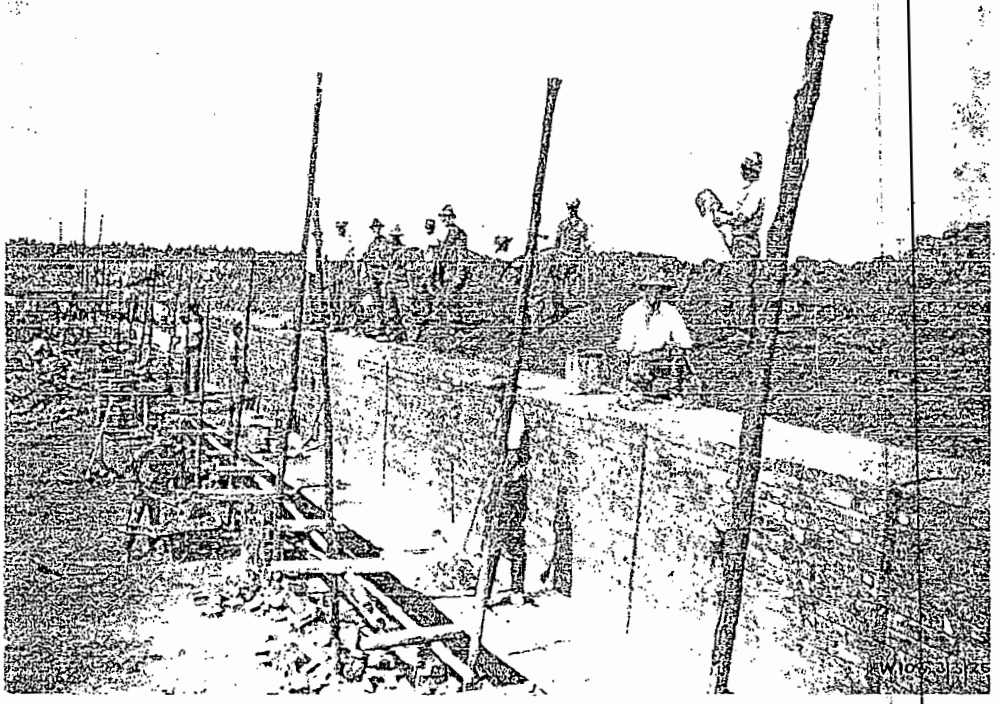
SOURCE LIST

ESCOM	ESCOM Archives.
VFTP	The Victoria Falls & Transvaal Power Co. Ltd. Witbank Power Station. ESCOM Archives, JR521, Album 2.
ESCOM 1934	ESCOM. 1934. *Witbank Undertaking, 10 Years/10 Jare.*

A) View of excavations from Turbine House looking south, 14/11/24 (VFTP W47).

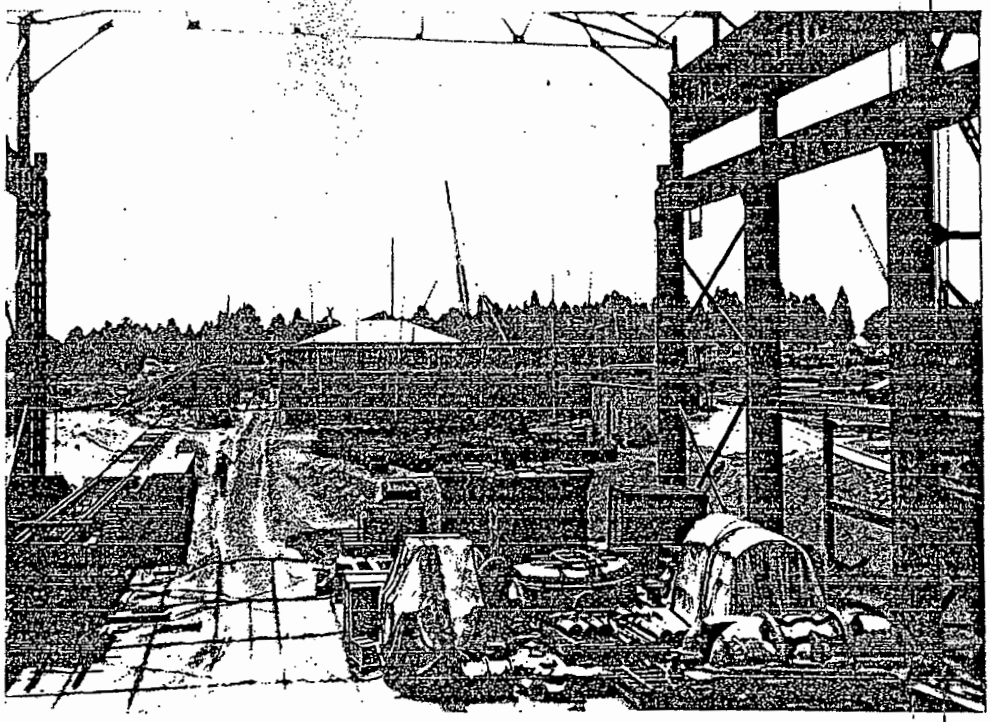
B) View of excavation from north wall of Boiler House, 9/1/25 (VFTP W79).

ESCOM: WITBANK POWER STATION: TURBINE HOUSE: PLATE 2

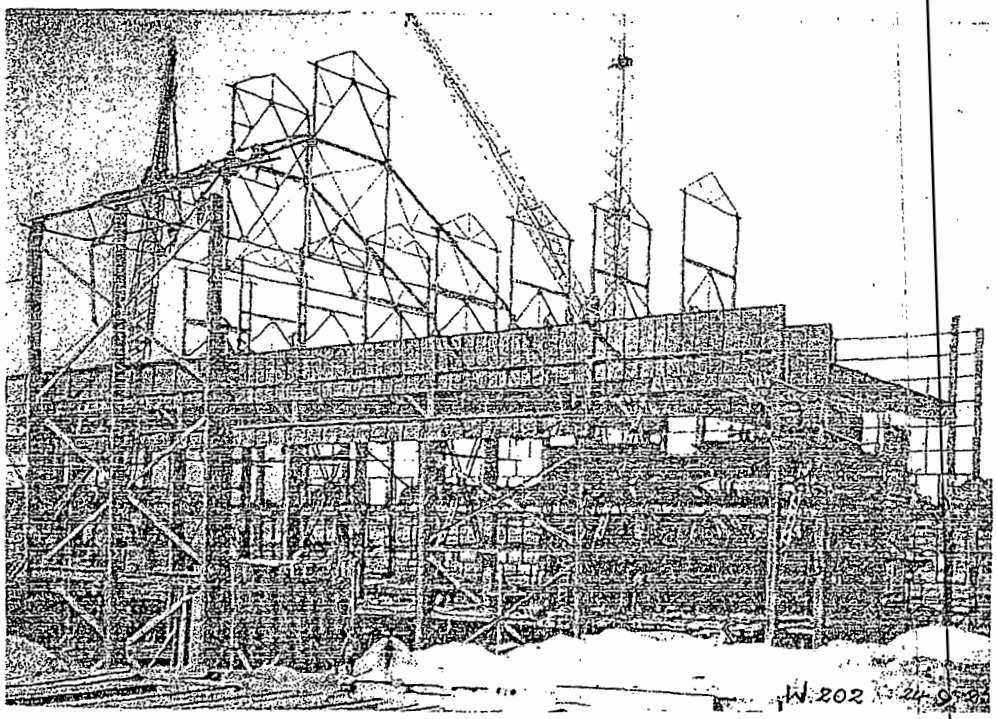


A) View of brick retaining wall, west side of Turbine House, 3/3/25 (VFTP W108).

B) Looking north to off-loading bay end of Turbine House, showing temporary storing of generator transformers and part of machinery for main turbines, 18/11/25 (VFTP W240).

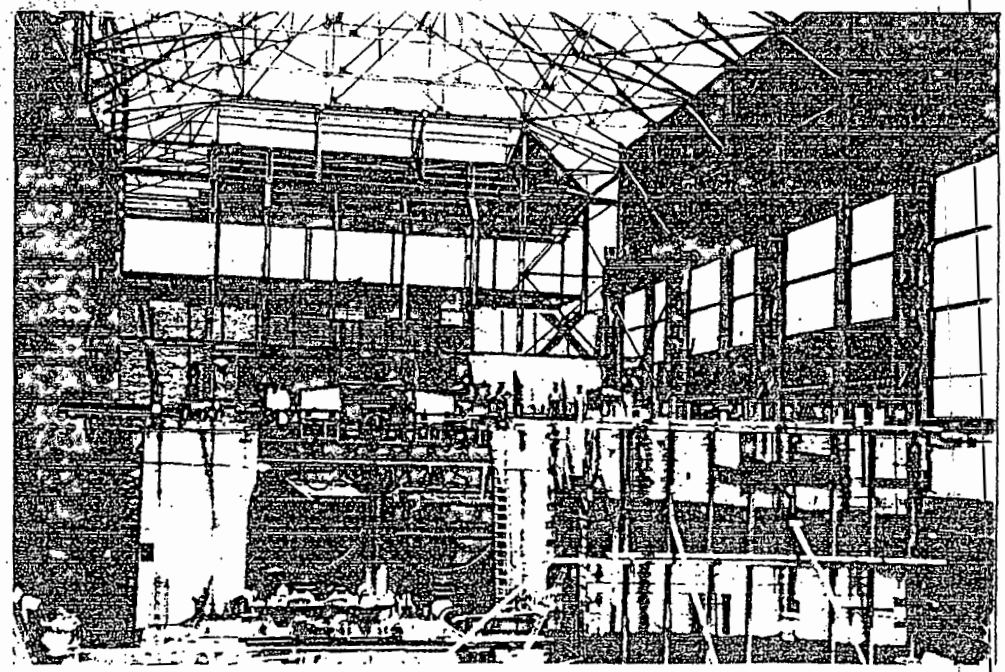


ESCOM WITBANK POWER STATION TURBINE HOUSE PLATE 3

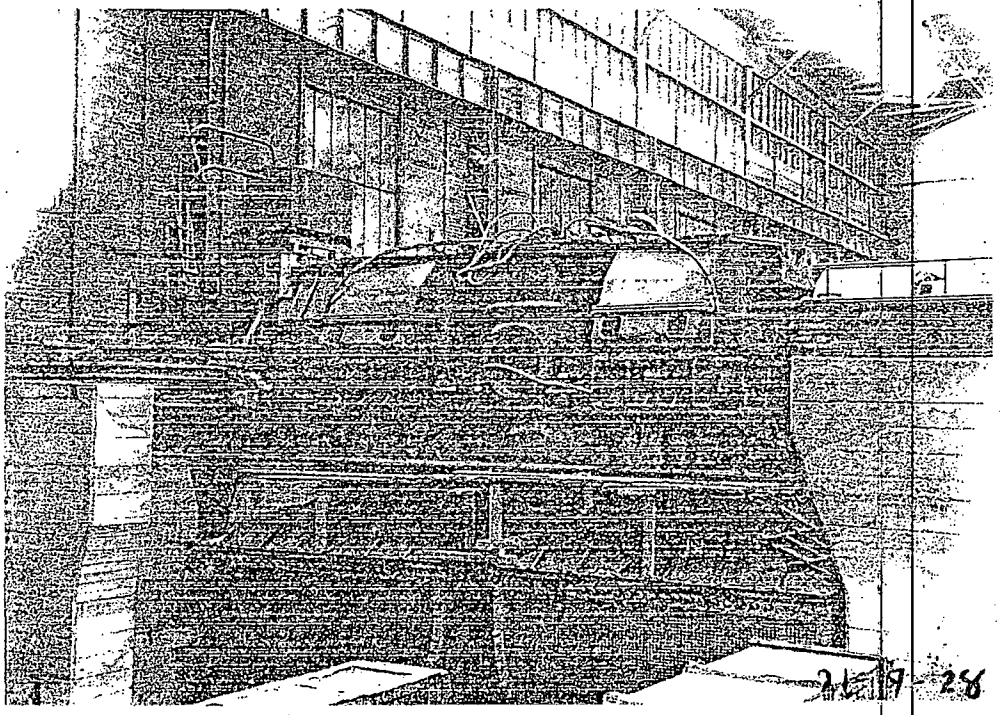


A) Erection of Turbine Hall steel roof principals, 24/9/25 (VFTP W202).

B) View of south end of Turbine House showing progress of erection of 1st 20 000KW turbo alternator, 19/1/26 (VFTP W269).

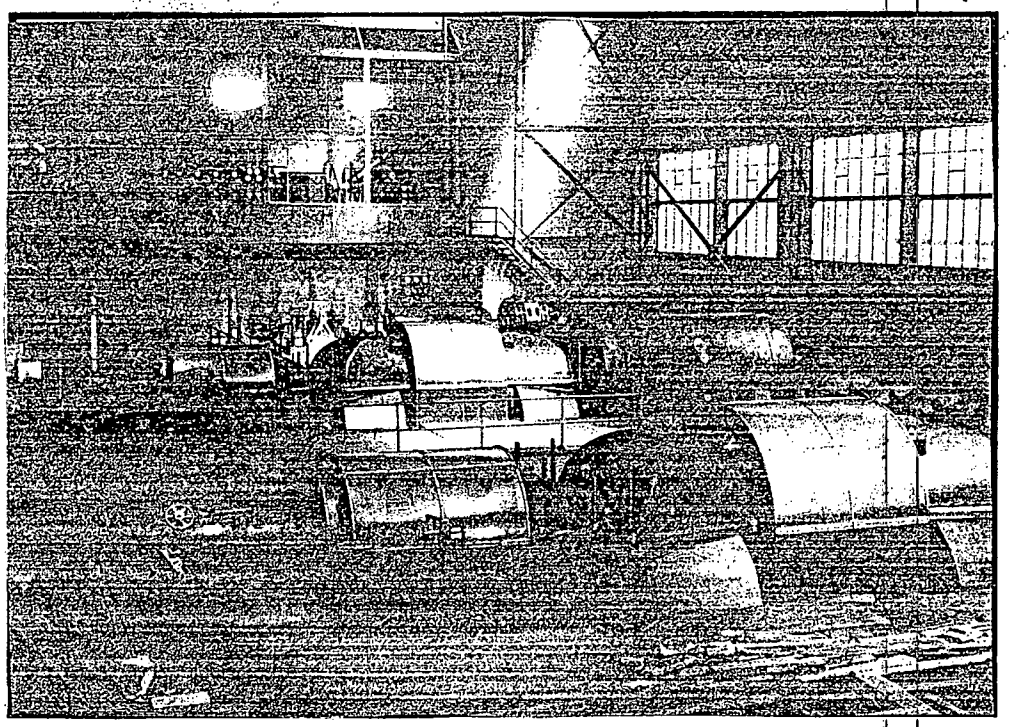


ESCOM - WITBANK POWER STATION - TURBINE HOUSE - PLATE 4

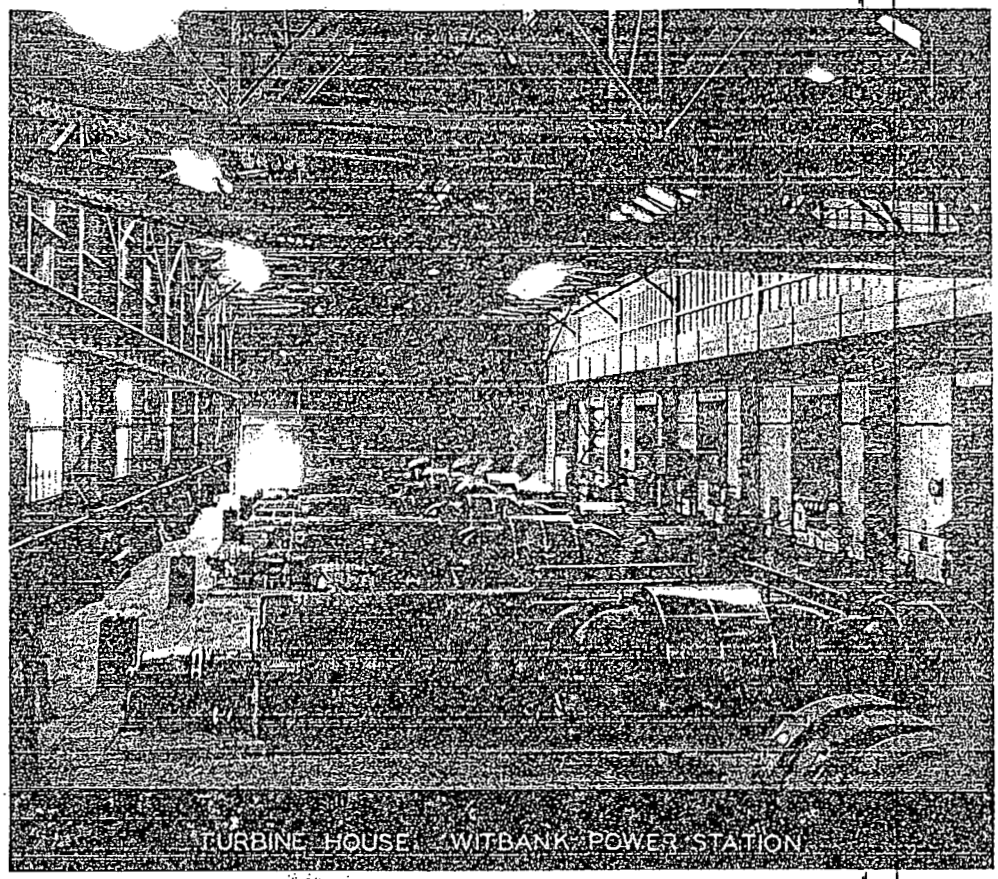


A) View showing erection of No.4 Set, showing both condensers in position and lower half of low pressure turbine on its foundation, 21/9/28 (VFTP W382).

B) View in Turbine House, looking southwards, showing No's.1 and 2 Parsons' 20 000KW Sets and Parsons' 1 000KW auxiliary turbo alternator (near south wall), *sine anno* (VFTP, no number).

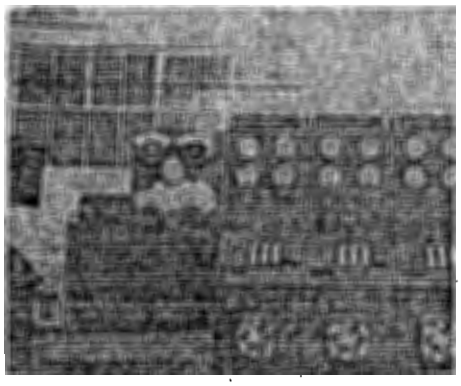


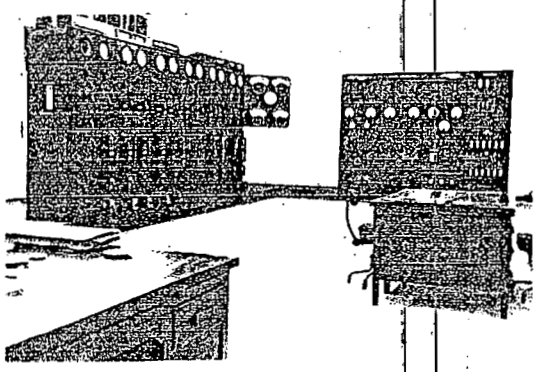
ESCOM * WITBANK POWER STATION * TURBINE HOUSE PLATE 5



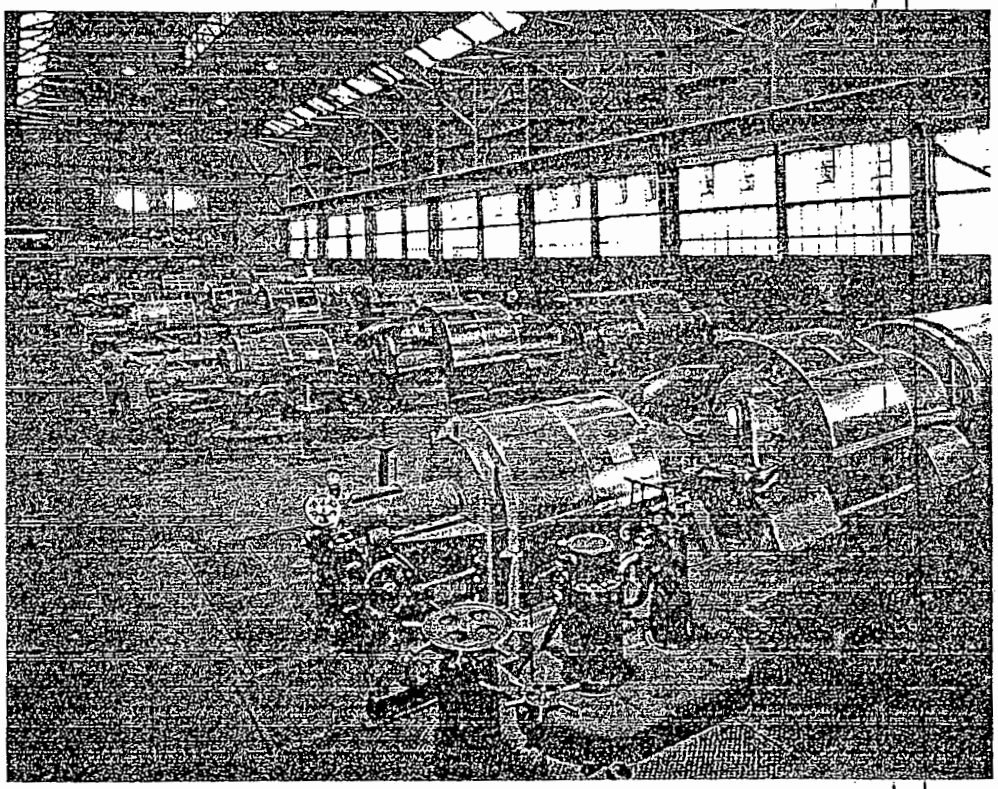
A) View in Turbine House [looking north] (ESCOM File 9, SK05, *sine anno*).

B) Control room, (ESCOM File 9, No.524 [left] and 529 [right], *sine anno*])



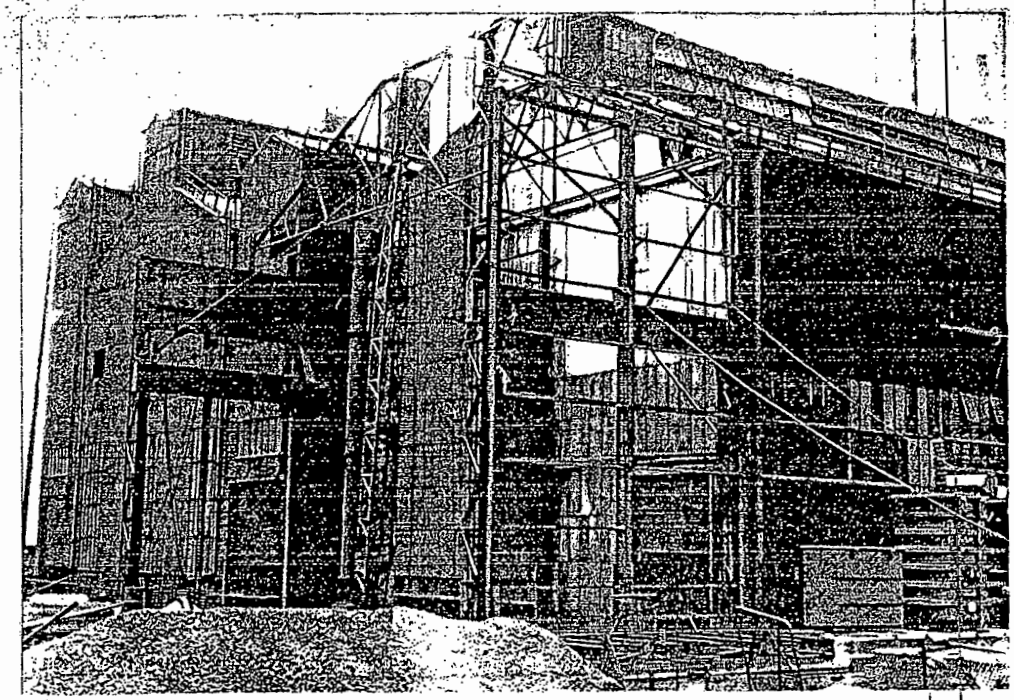


ESCOM * WITBANK POWER STATION * TURBINE HOUSE PLATE 6



A) Turbine House interior [to south] (ESCOM File 9, SK054, photo Yates)

B) Extension to Turbine House, south east view 28/11/1929 (VFTP W444).



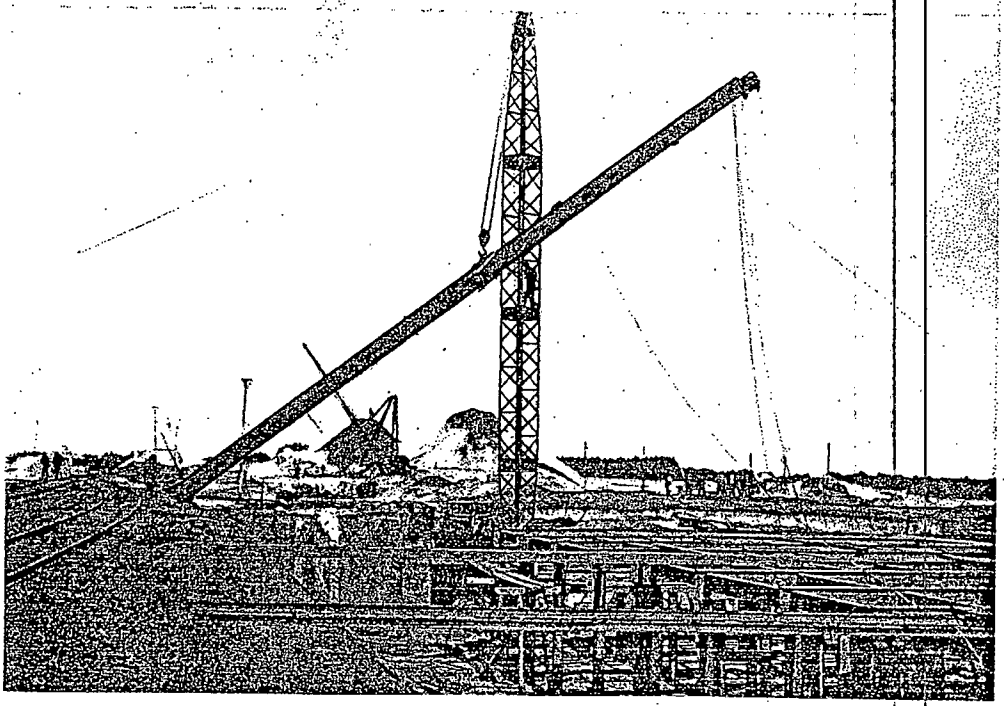
ESCOM * WITBANK POWER STATION * TURBINE HOUSE * PLATE 6

A) West wall of extension to Turbine House, 28/2/1930 (VFTP W457).

ESCOM * WITBANK POWER STATION * BOILER HOUSE PLATE 6

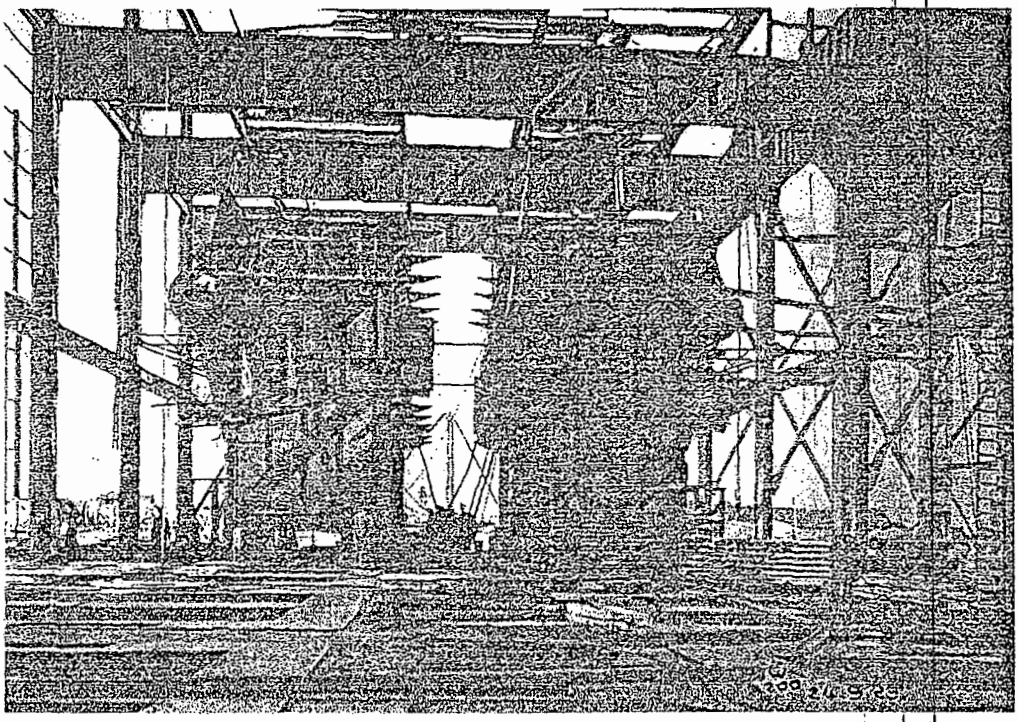
A) View of excavations from substructure foundations in Boiler House (East side), 18/1/25 (VFTP W113).

B) Erection of the 1st building column in the south east corner of the Boiler House, 15/1/25 (VFTP W150).



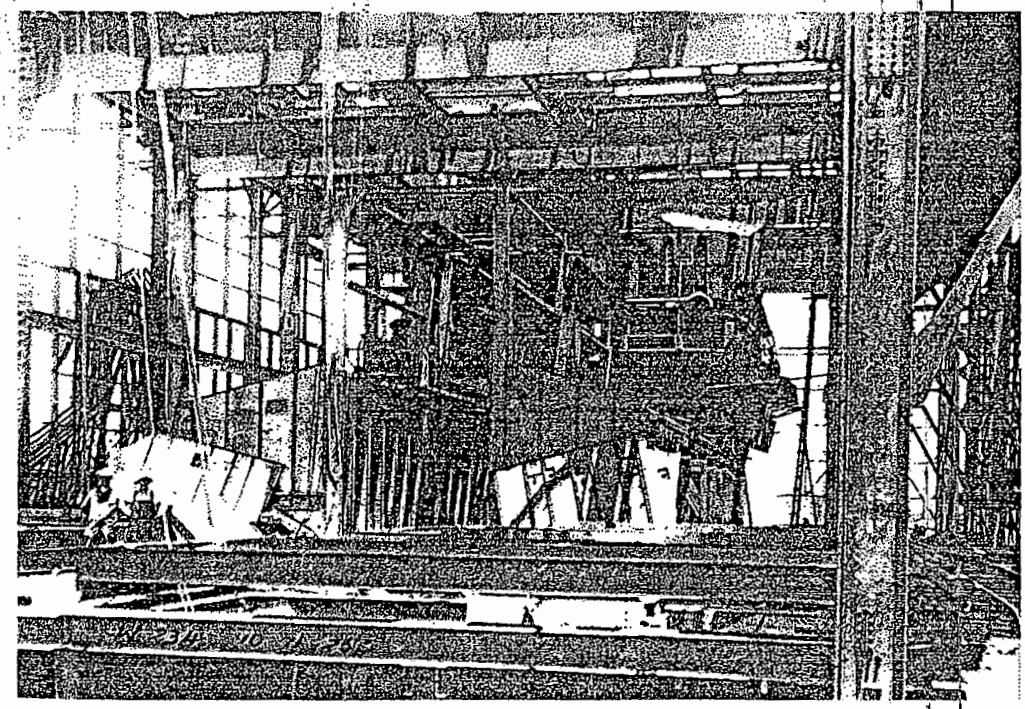
CULTMATRIX

ESCOM * WITBANK POWER STATION * BOILER HOUSE PLATE 7



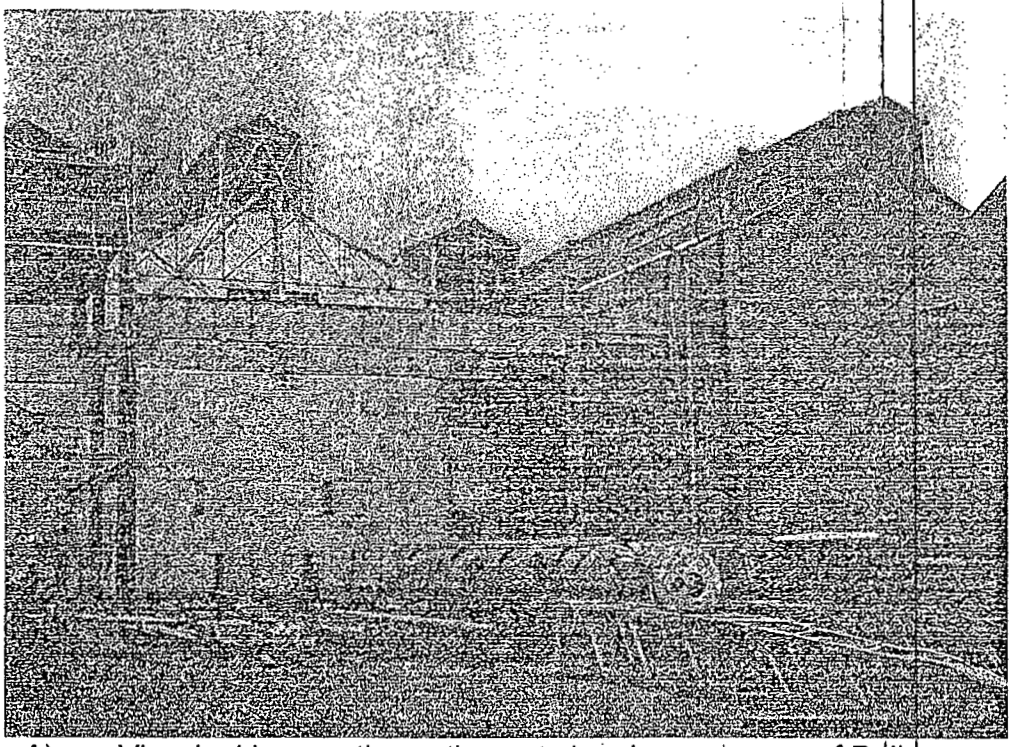
A) View from north end of Boiler House, showing erection of the first four boilers and surrounding steelwork, 24/9/25 (VFTP W200).

B) View showing erection of boilers No's 5-12, 10/11/25 (VFTP W234).



CULTMATRIX

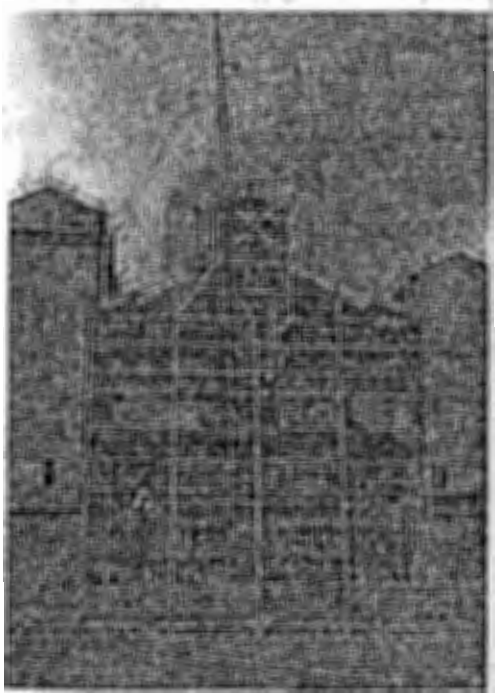
ESCOM * WITBANK POWER STATION * BOILER HOUSE * PLATE 8

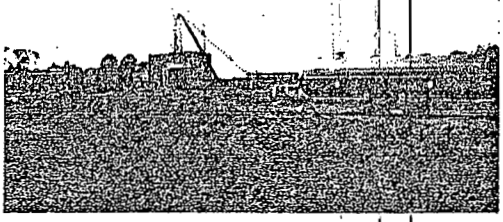


A) View looking south-south west showing progress of Boiler House steelwork erection with three extension boiler drums in foreground, 21/9/28 (VFTP W383).

B) View showing existing end of Boiler House partly dismantled, [for extension process] 9/5/1934 (VFTP W471).

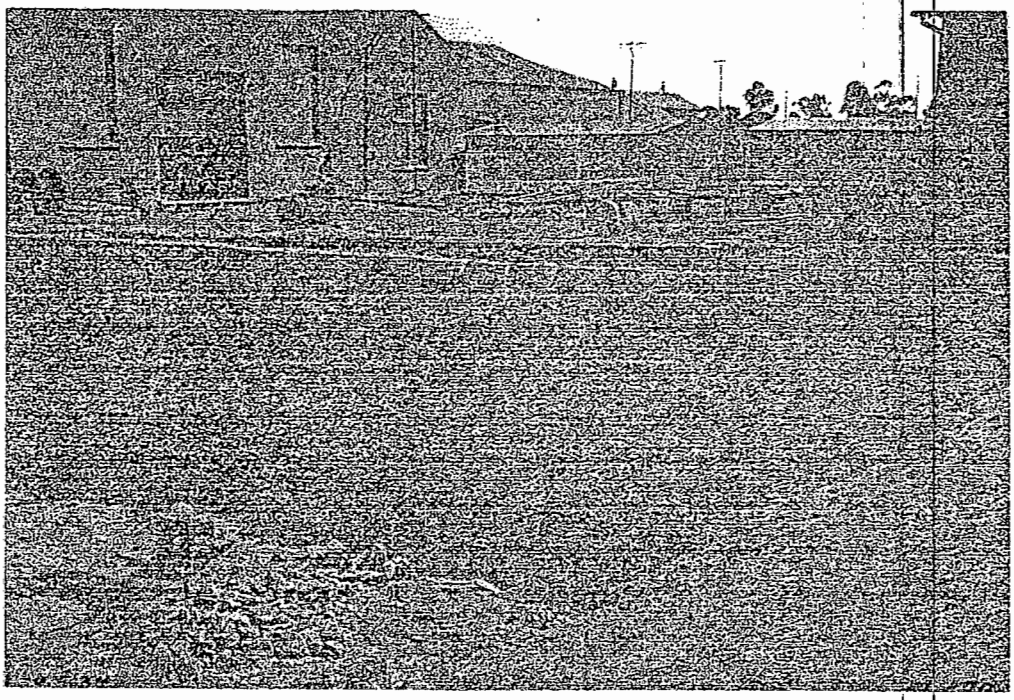
C) First boiler drum & tubes [for extension] to arrive at site, 28/6/1934 (VFTP W477) [date anomaly with A) and B)].





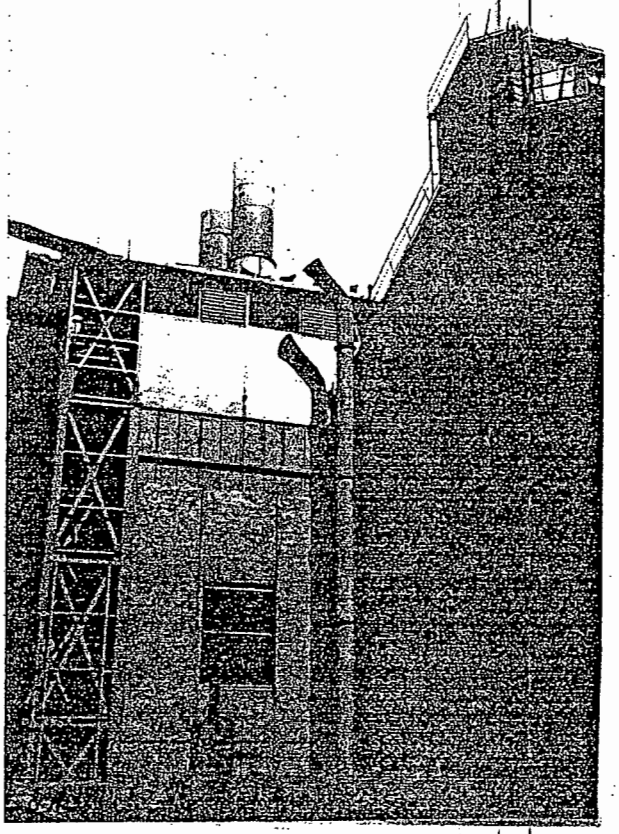
CULTMATRIX

ESCOM * WITBANK POWER STATION * BOILER HOUSE PLATE 9



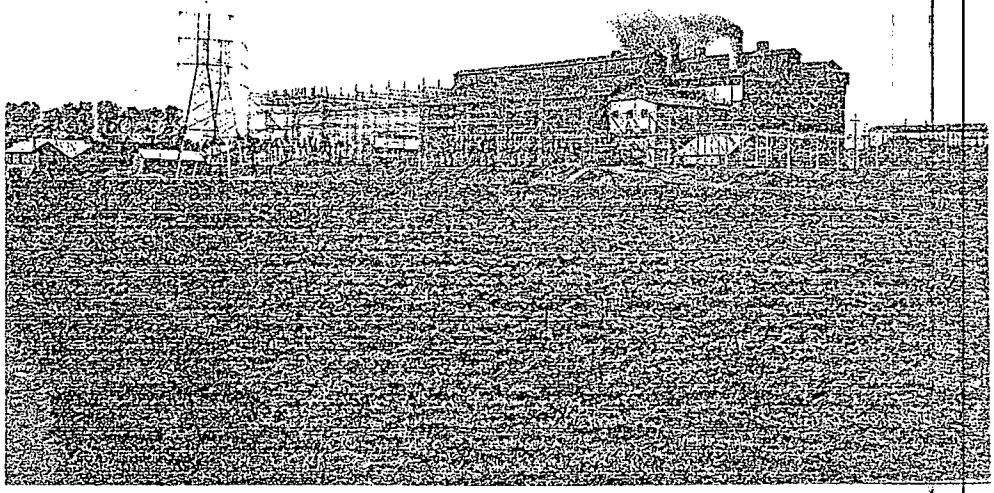
A) View of concrete retaining wall at north end of Boiler House extension's excavation, 9/5/1934 (VFTP W470).

B) View of Boiler House extension west wall showing completed brickwork, 8/11/34 (VFTP W498).



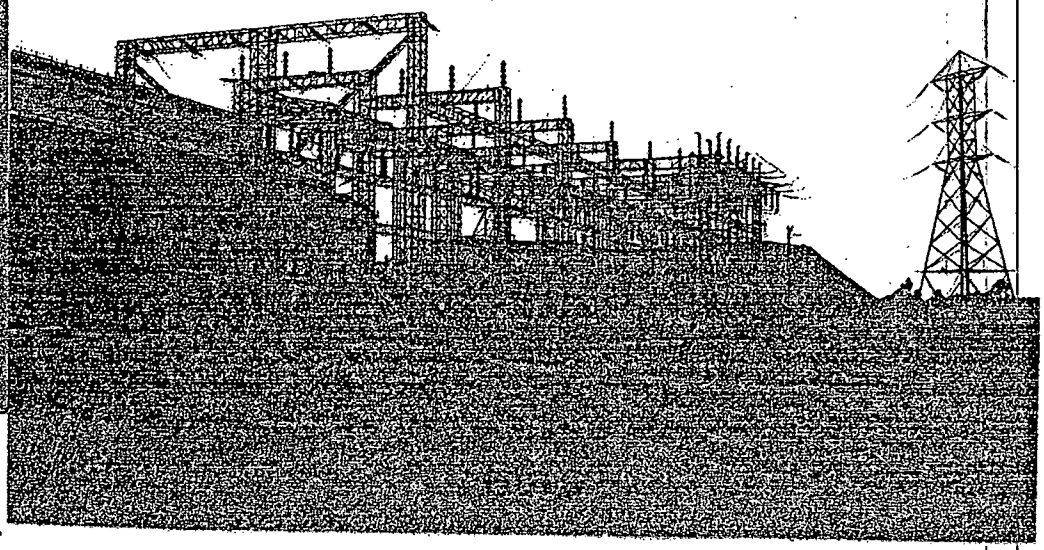
CULTMATRIX

ESCOM - WITBANK POWER STATION - DISTRIBUTION PLATE 10



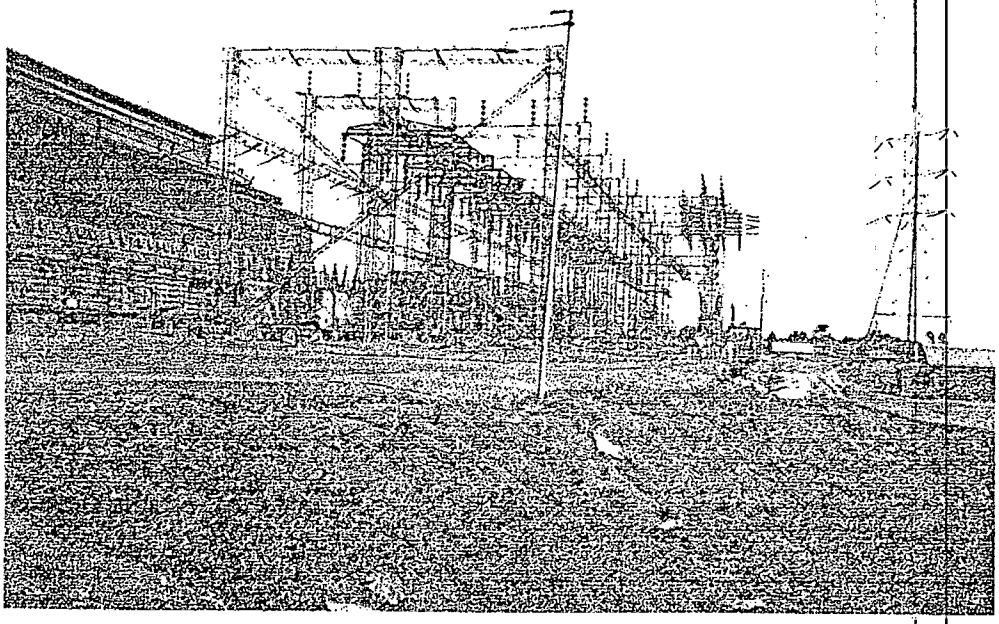
A) Distant view of station looking north east, 29/9/26 (VFTP W335).

B) 132KW structure, gear and pylon – view from north west (ESCOM, Anonymous).



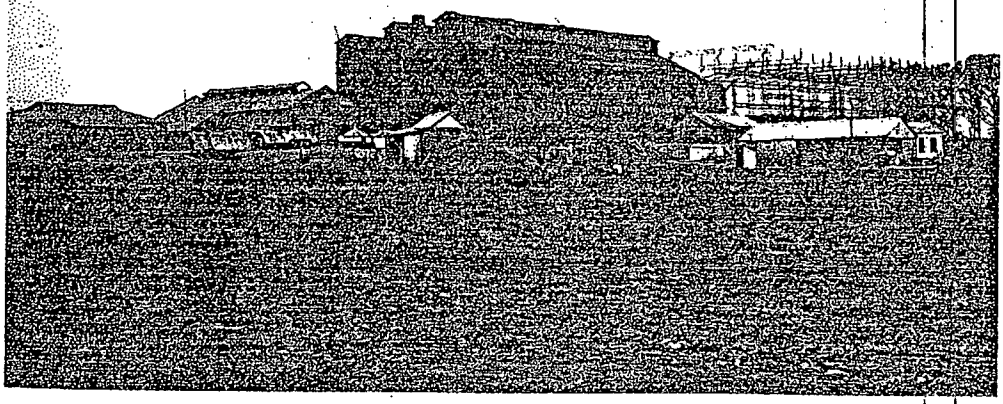
CULTMATRIX

ESCOM - WITBANK POWER STATION - DISTRIBUTION PLATE 11



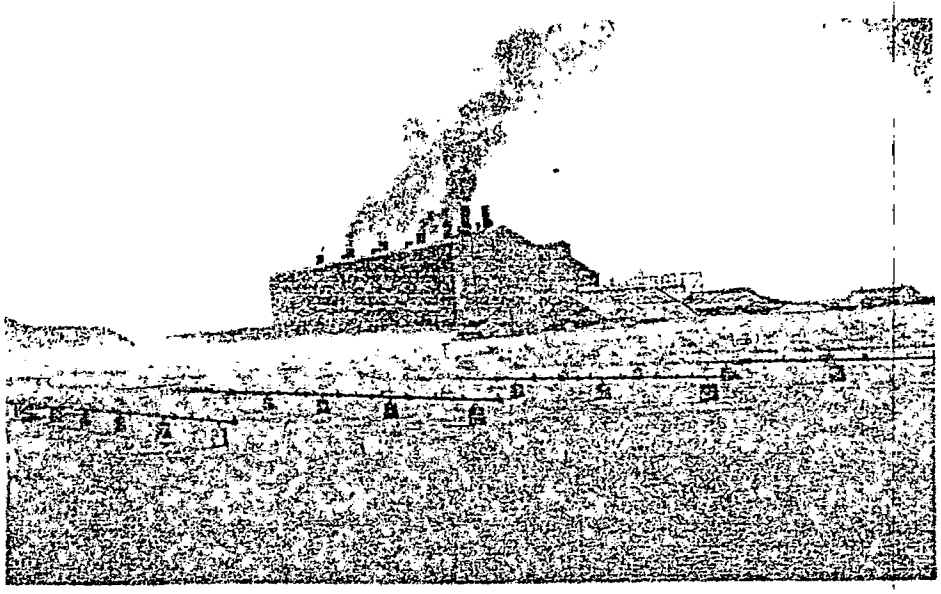
A) 132KW structure, gear and lines to Brakpan (ESCOM, 5067, photo by Gibbons).

B) Distant view of station looking south east, 29/9/26 (VFTP W339).



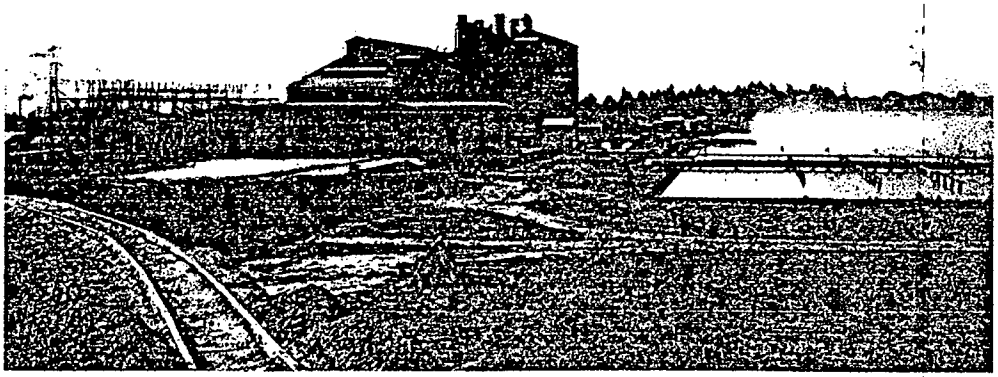
CULTMATRIX

ESCOM * WITBANK POWER STATION – COOLING PONDS PLATE 12



A) View of power station from No.5 cooling pond (ESCOM, 046, photo by Gibbons).

B) View of station looking from ash dump, 7/3/1927 (VFTP W350).

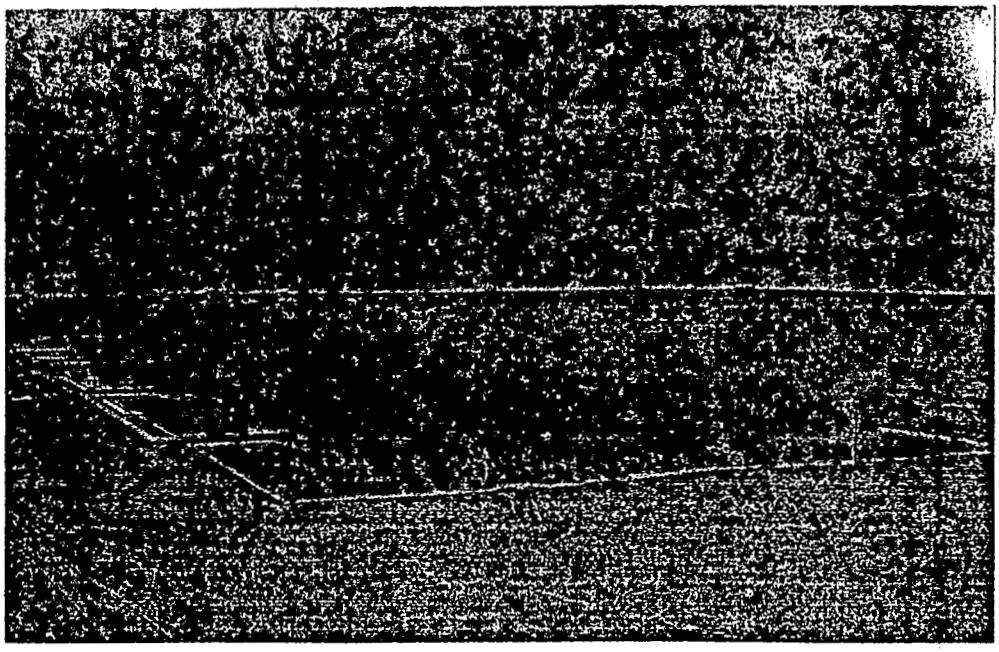


CULTMATRIX

ESCOM * WITBANK POWER STATION – COOLING PONDS PLATE 13

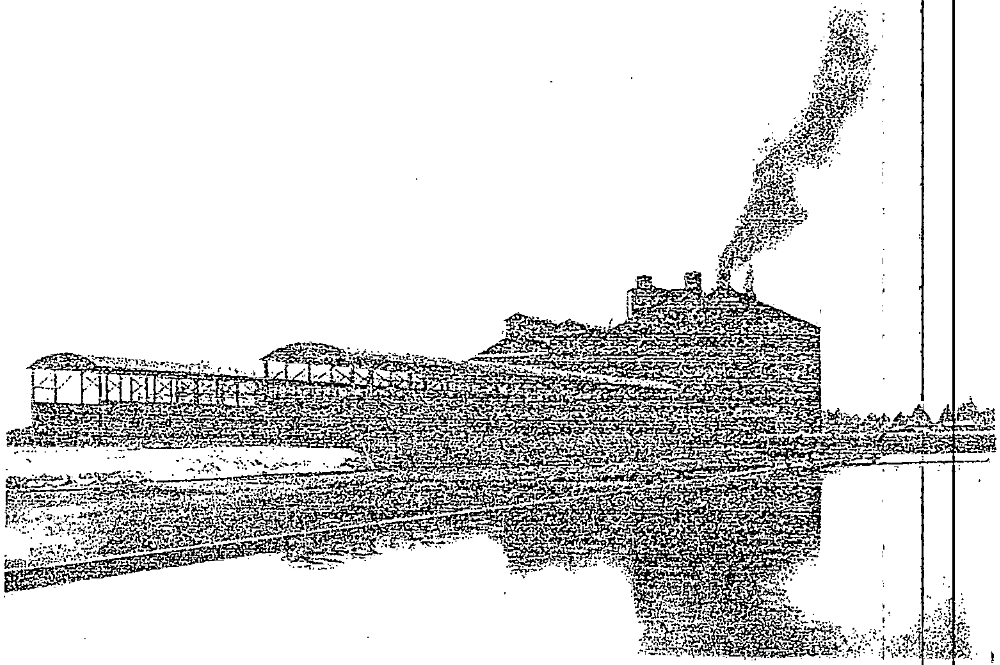
A) View of power station and cooling ponds from south (ESCOM, 8635, photo by Gibbons).

B) View of cooling ponds from south-south west (ESCOM, File 9, *sine anno*, no number).



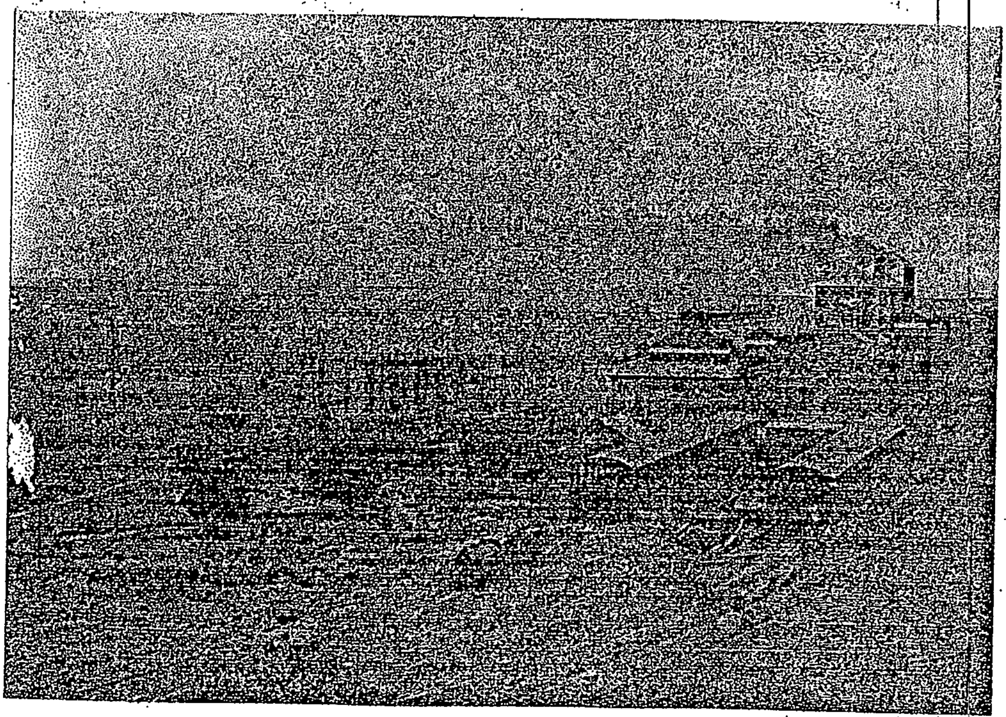
CULTMATRIX

ESCOM * WITBANK POWER STATION – COAL DELIVERY   PLATE 14



A) View of rails and coal bunkers from south east, 18/12/28 (VFTP, no number).

B) View of rails and coal bunkers from south-south west (ESCOM, *sine anno*, Anonymous, no number)



CULTMATRIX

ESCOM * WITBANK POWER STATION – ASH DUMP PLATE 15

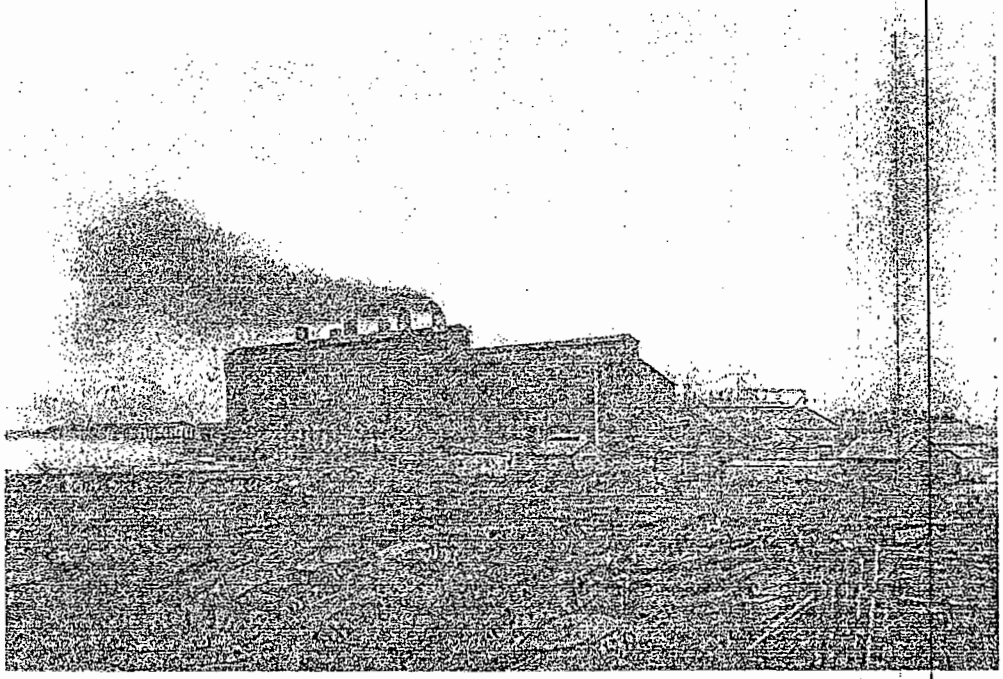
A) Distant view of station looking north [showing ash dump], 29/9/26 (VFTP W344)

B) View north from ash dump, 5/3/1929 (VFTP W413).

CULTMATRIX..

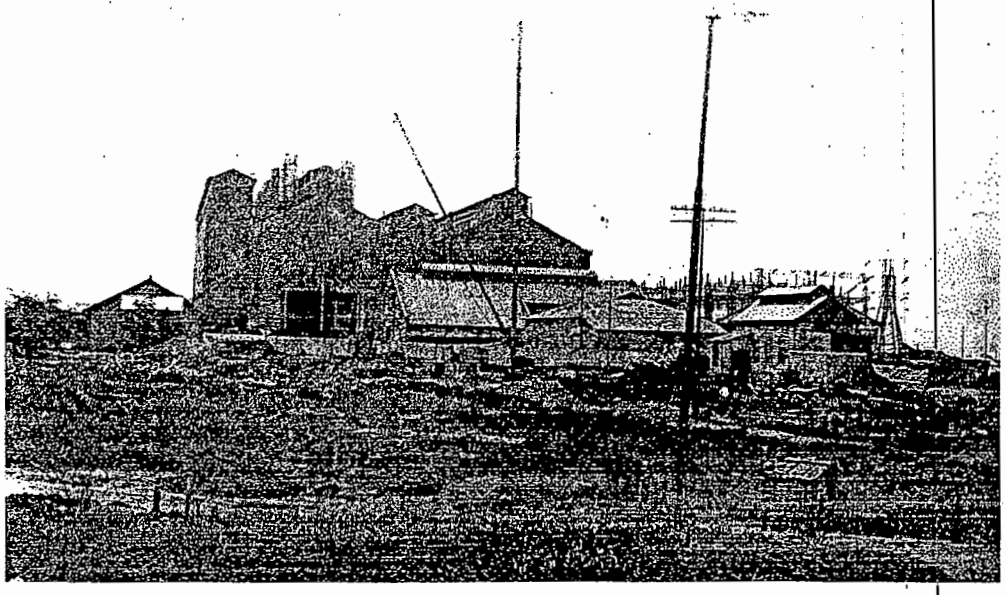
ESCOM - WITBANK POWER STATION – MAINTENANCE

PLATE 16



A) View from north east, 25/5/1927 [Oil store, workshop and other maintenance buildings in foreground] (VFTP W355).

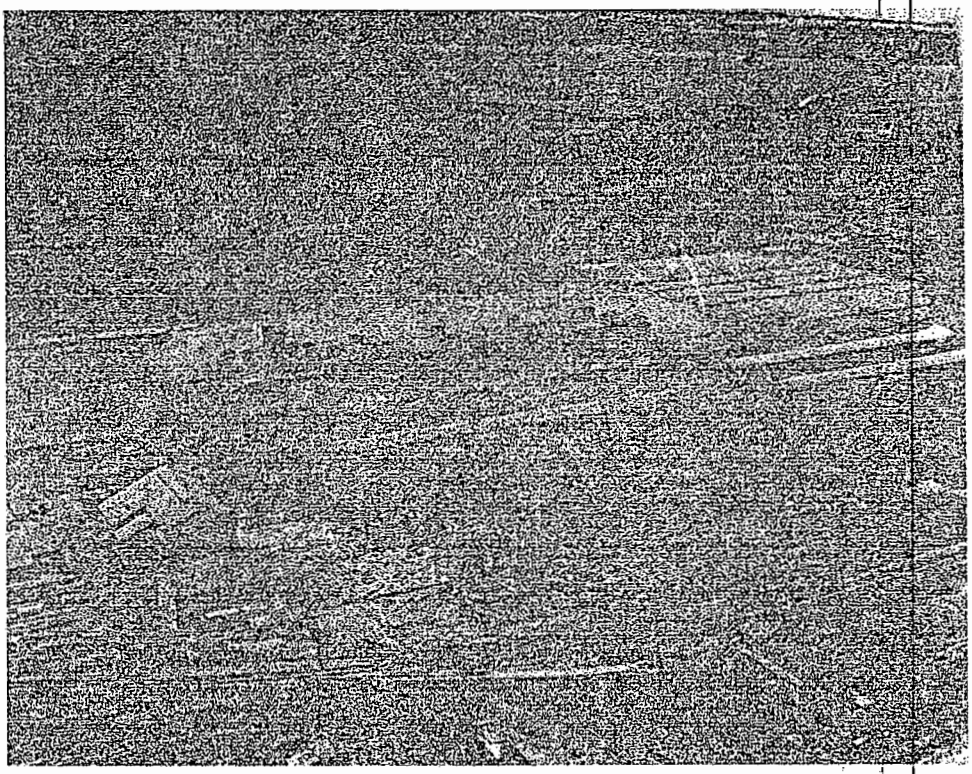
B) View south showing both new chimneys erected, [*ca* Jan-Feb 1929] – [oil store left, workshop middle back](VFTP W409).



CULTMATRIX

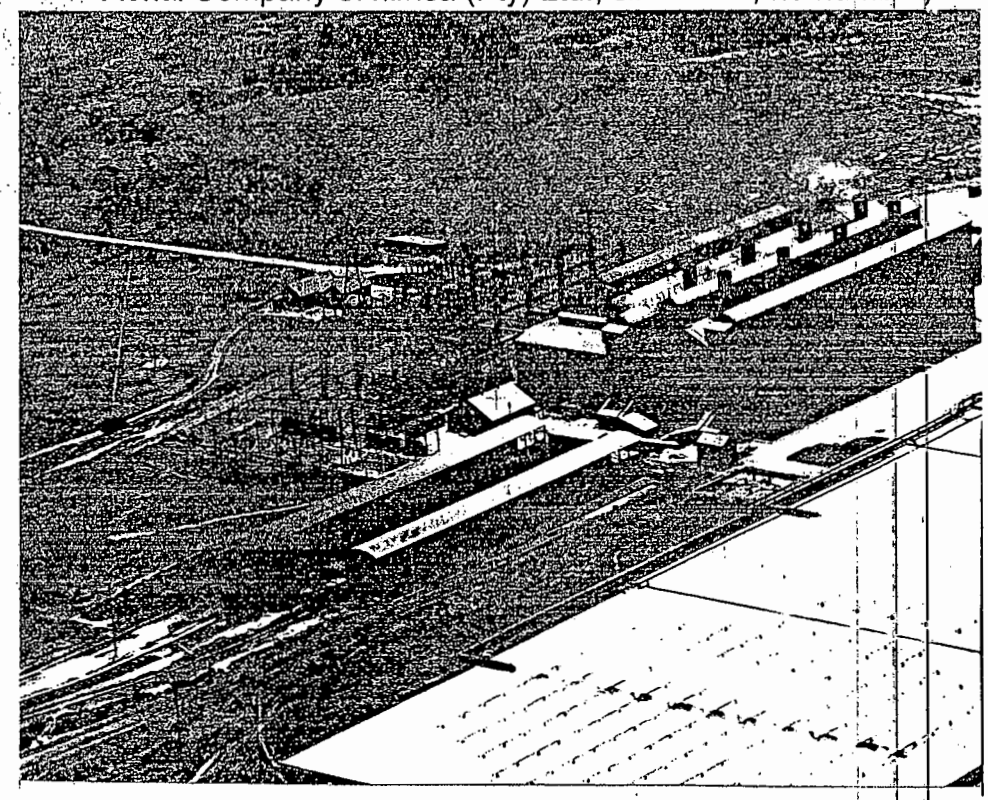
A) View showing assembling and riveting steelwork for Turbine House extension [workshop and other maintenance buildings north of Turbine House, 29/10/1929 (VFTP W439).

ESCOM * WITBANK POWER STATION – OVERALL VIEWS PLATE 18



A) Aerial view of power station from north west (Escom, File 9, anonymous, *sine anno*, no number).

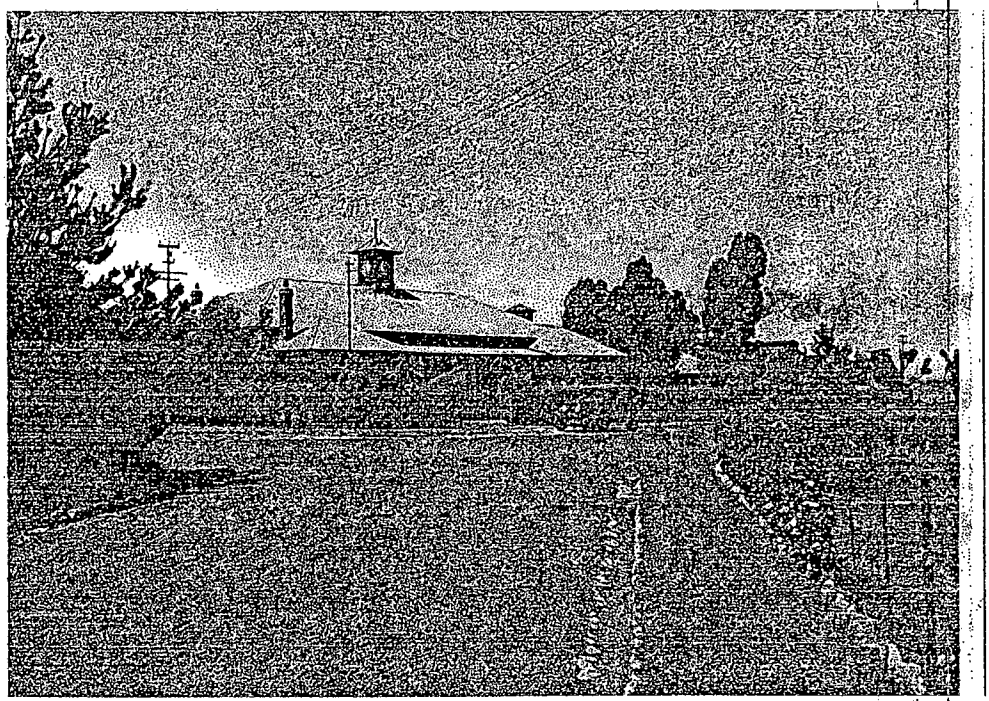
B) Aerial view of power station from south east (Escom, File 9 – Aerial Company of Africa (Pty) Ltd., *sine anno*, no number).

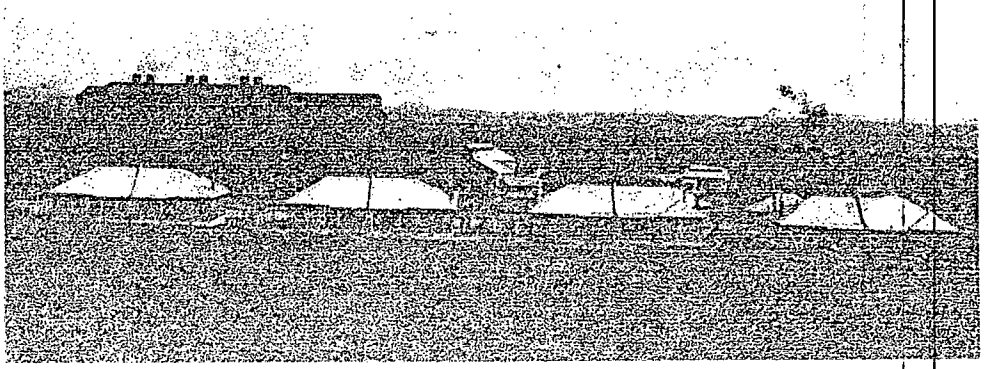


CULTMATRIX

A) Aerial view to the west from watertank at north east corner of power station perimiter, 24/6/1926 (VFTP W321).

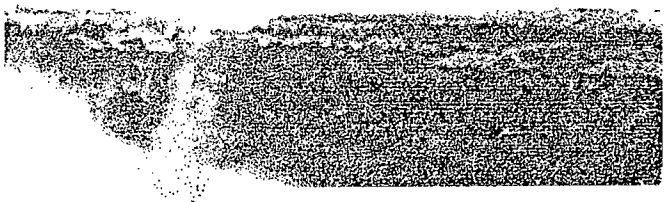
B) Clubhouse [note townscape and placing of screen of trees to hide visual contact with Power station] (Escom, File 9 – Photograph by Yates).



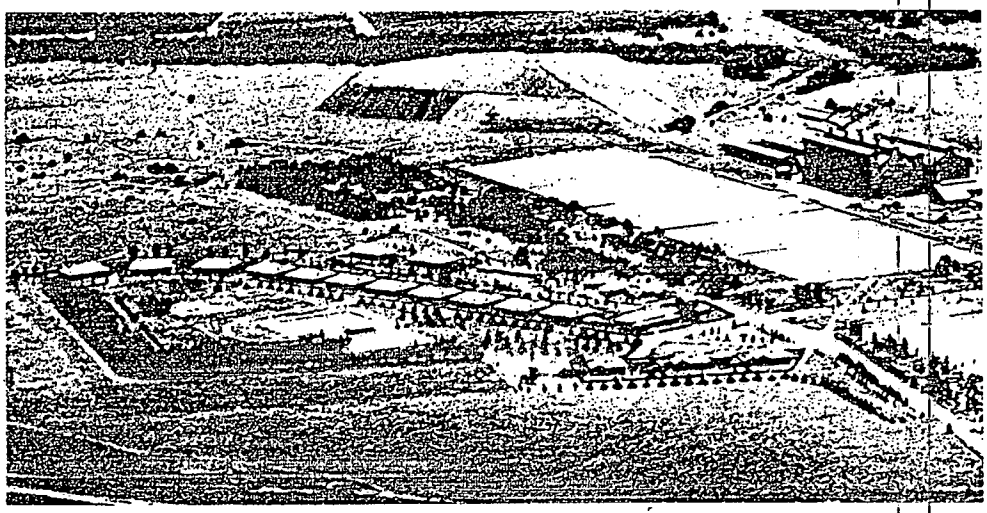


A) Detail of middle-management housing shown in view to the west from watertank at north east corner of power station perimeter, 24/6/1926 (VFTP W321).

B) Detail of housing from photo taken from ash dump to the south (ESCOM, 8635 photo from Gibbons, *sine anno*).



C) Aerial view of power station complex with ash dump and rail lines, cooling ponds, housing and recreation in 1934 (ESCOM, 1934, p.31).



A) Employees bowling green in 1934 (ESCOM, 1934, p.42 [middle]).

B) Employees' tennis courts in 1934 (ESCOM, 1934, p.42 [top]).