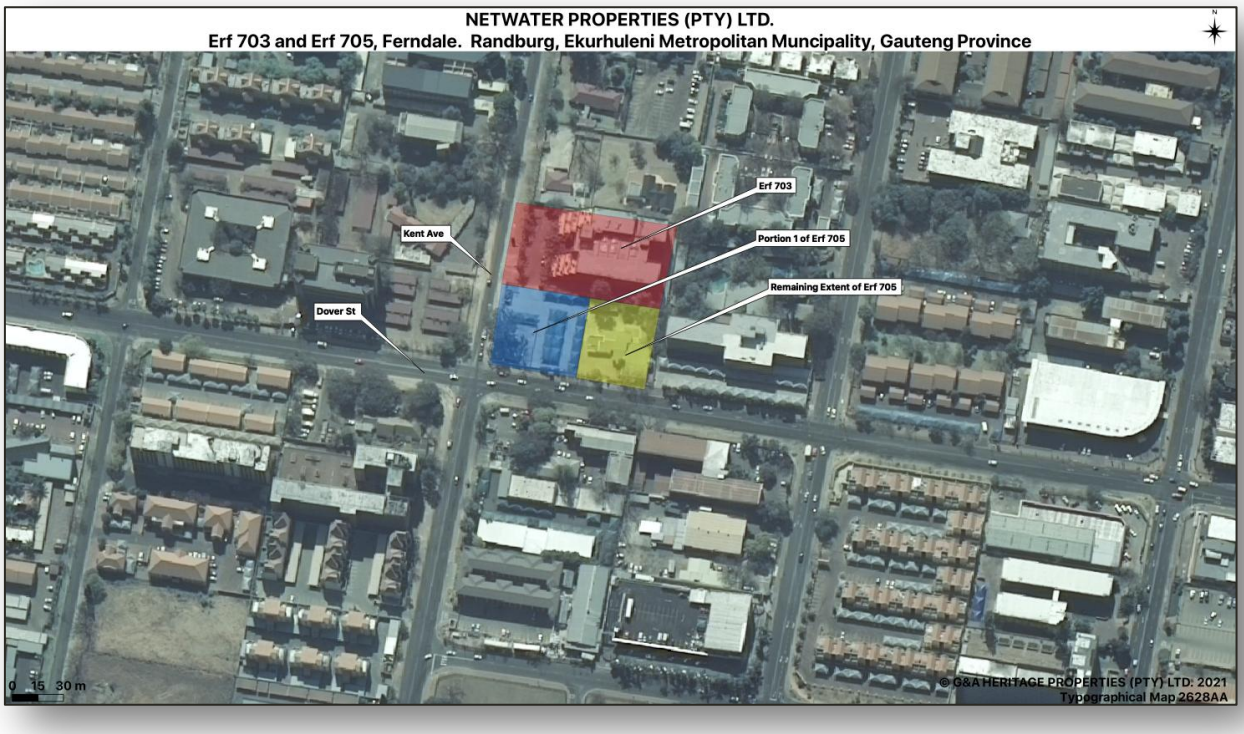
G & A Heritage

Heritage Management Consultants



PROPOSED DEMOLISHING OF STRUCTURES LOCATED PORTION 1 AND REMAINDER OF ERF 705 ON THE FARM KLIPFONTEIN 203 IN FERNDALE, RANDBURG, EKURHULENI METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE.

Heritage Impact Assessment (HIA) Report

February 2021

CREDIT SHEET

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REPORT AUTHOR

Stephan Gaigher

Disclaimer; *Although all possible care is taken to identify all sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. G&A Heritage and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

Statement of Independence
As the duly appointed representative of G&A Heritage, I Stephan Gaigher, hereby confirm my independence as a specialist and declare that neither I nor G&A Heritage have any interests, be it business or otherwise, in any proposed activity, application or appeal in respect of which the Environmental Consultant was appointed as Environmental Assessment Practitioner, other than fair remuneration for work performed on this project.

SIGNED BY: STEPHAN GAIGHER

MANAGEMENT SUMMARY

Project Name and Location

Proposed Demolishing of Structures located on Portion 1 and Remainder of Erf 705 on the Farm Klipfontein 203 in Ferndale, Randburg, Ekurhuleni Metropolitan Municipality, Gauteng Province.

Consultant

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Appointed By

Netwater Properties (Pty) Ltd.

Date of Report

17 February 2021

MANAGEMENT SUMMARY

The purpose of the management summary is to distil the information contained in the report into a format that can be used to give specific results quickly and facilitate management decisions. It is not the purpose of the management summary to repeat in shortened format all the information contained in the report, but rather to give a statement of results for decision making purposes.

This study focuses on the proposed demolishing of structures located on Portion 1 and Remainder of Erf 705 on the Farm Klipfontein 203 in Ferndale, Randburg, Ekurhuleni Metropolitan Municipality, Gauteng Province.

The study encompasses the heritage impact investigation. A preliminary layout has been supplied to lead this phase of this study.

Scope of Work
A Heritage Impact Assessment (including Archaeological, Cultural heritage, Built Heritage and Basic Palaeontological Assessment to determine the impacts on heritage resources within the study area.

The following is required to perform this assessment:

- A desk-top investigation of the area;
- Identify possible archaeological, cultural, historic, built and palaeontological sites within the proposed development area;
- Evaluate the potential impacts of construction and operation of the proposed development on archaeological, cultural, historical resources; built and palaeontological resources; and
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural, historical, built and palaeontological importance.

The purpose of this study is to determine the possible occurrence of sites with cultural heritage significance within the study area. The study is based on archival and document research combined with fieldwork investigations.

Findings and Recommendations
The study area located on Portion 1 and Remainder of Erf 705 in Ferndale was investigated through archival studies. The area can be described as an urban environment with office blocks, shops, businesses and residential homes and complexes.

Even though the buildings on site are older than 60 years, these are in a dilapidated state and poses a risk to inhabitants due to its unsound condition.

The building on Erf 703 will not be part of the demolition application.

It is recommended that the documentation contained in this HIA report be deemed sufficiently comprehensive to obtain a permit for destruction form SAHRA and the PHRA-G's Built Environment Section after obtaining comments from SAHRA.

Fatal Flaws
No fatal flaws were identified.

CONTENTS

List of Figures

List of Tables

ABBREVIATIONS

Abbreviation	Meaning
BP	Before Present
BCE	Before the Common Era
Bp	Before Present
c.	circa
CBD	Central Business District
CE	Common Era
CSIR	Council for Scientific and Industrial Research
ECO	Environmental Control Officer
EIA	Early Iron Age
ELO	Environmental Liaison Officer
ESA	Early Stone Age
ESMS	Environmental and Social Management System
ESSS	Environmental and Social Safeguard Standards
Fm	Femtometre (10^{-15}m)
GPS	Geographic Positioning System
G-PHRA	Gauteng Provincial Heritage Resources Authority
HIA	Heritage Impact Assessment
ICP	Informed Consultation and Participation
LIA	Late Iron Age
LSA	Late Stone Age
MSA	Middle Stone Age
MYA	Million Years Ago
NHRA	National Heritage Resources Agency
PHRA	Provincial Heritage Resources Agency
PIA	Palaeontological Impact Assessment
PS	Performance Standard
SAHRA	South African Heritage Resource Agency
SAHRIS	South African Heritage Information System
SAPS	South African Police Service
SHE	Safety, Health and Environment
SHEQ	Safety, Health, Environment and Quality
S&EIR	Scoping and Environmental Impact Reporting
Um	Micrometre (10^{-6}m)
WGS 84	World Geodetic System for 1984

GLOSSARY OF TERMS

'**Archaeological**' means:

a) Material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
b) Rock art, being a form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and is older than 100 years including any area within 10 m of such representation; and
c) Wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land or in the maritime cultural zone referred to in section 5 of the Maritime Zones Act 1994 (Act 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which are older than 60 years or which in terms of national legislation are considered to be worthy of conservation;
d) Features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

'**Circa**' is used in front of a particular year to indicate an approximate date.

'Grave' means a place of interment and includes the contents, headstone or other marker of and any other structures on or associated with such place. The South African Heritage Resources Agency (SAHRA) will only issue a permit for the alteration of a grave if it is satisfied that every reasonable effort has been made to contact and obtain permission from the families concerned.

'Paleontological' means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

A '**place**' is defined as:

a) A site, area or region;
b) A building or other structure (which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure);
c) A group of buildings or other structures (which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures); and (d) an open space, including a public square, street or park; and in relation to the management of a place, includes the immediate surroundings of a place.

'**Structures**' means any building, works, device, or other facility made by people and which is fixed to land and any fixtures, fittings and equipment associated therewith older than 60 years.

1. General

1.1 Introduction

Netwater Properties (Pty) Ltd. proposes the demolishing of structures located on Portion 1 and Remainder of Erf 705 on the Farm Klipfontein 203 in Ferndale, Randburg, Ekurhuleni Metropolitan Municipality, Gauteng Province. The aim of the study is to identify all heritage sites, to document these and to assess the significance within local, provincial, and national context.

1.2 Property Description and Demarcation

G&A Heritage was appointed by *Netwater Properties (Pty) Ltd.* to undertake a Heritage Impact Assessment (HIA) for the proposed demolishing of structures located on Portion 1 and Remainder of Erf 705 on the Farm Klipfontein 203 in Ferndale, Randburg, Ekurhuleni Metropolitan Municipality, Gauteng Province.

Ferndale is a suburb of Johannesburg. It is situated in Administrative Region B in the central part of the City of Johannesburg Metropolitan Municipality, Ekurhuleni. It has a good mix of residential homes, shops and commercial properties. The suburb originates from around 1909 and the name was derived from the ferns growing in a valley.

The study area is located on the corners of Dover Street and Kent Avenue. The area under investigation is approximately 0.803ha in extent.

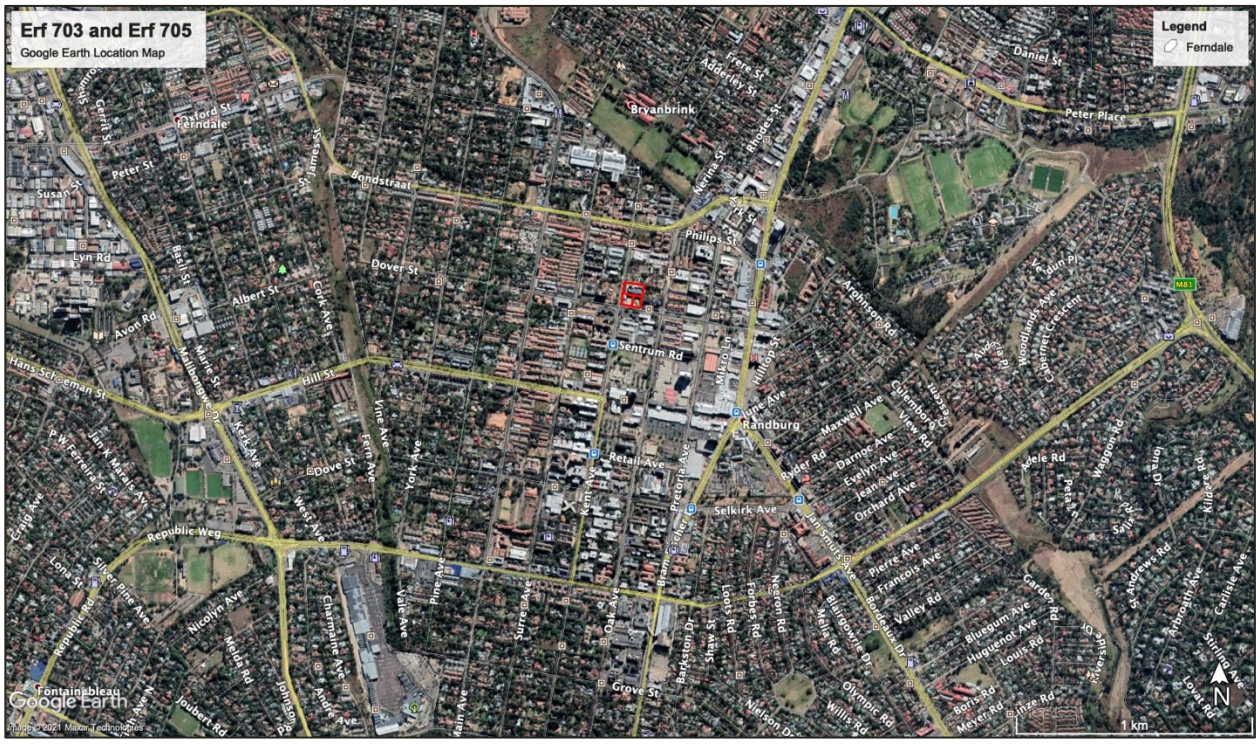

Figure 1. Study area in relation to the neighbouring suburbs of the City of Johannesburg

Figure 2. Study area on the corners of Dover Street and Kent Avenue

1.3 Technical Scope of HIA

This HIA focused only on the areas to be directly affected by the proposed development and is meant to deliver, evaluate and inform on the following aspects:

(a) The identification and mapping of all heritage resources in the area affected;
(b) An assessment of the significance of such resources in terms of the heritage assessment criteria set out in the relevant legal descriptions, development proponent requirements and as per international best practise approaches and charters;
(c) An assessment of the impact of the development on such heritage resources;
(d) An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
(e) The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
(f) If heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
(g) Plans for mitigation of any adverse effects during and after the completion of the proposed development.

The following categories of heritage objects are considered.

Graves: Places of interment including the contents, headstone or other marker of and any other structures on or associated with such place. This may include any of the following:

1) Ancestral graves,
2) Royal graves and graves of traditional leaders
3) Graves of victims of conflict i.e. graves of important individuals
4) Historical graves and cemeteries older than 60 years
5) Other human remains, buried or otherwise.

The removal of graves is subject to the following procedures:

- Notification of the impending removals (using local language media and notices at the grave site);
- Consultation with individuals or communities related or known to the deceased;

- Satisfactory arrangements for the curation of human remains and / or headstones in a museum, where applicable;
- Procurement of a permit from the relevant controlling body;
- Appropriate arrangements for the exhumation (preferably by a suitably trained archaeologist) and re-interment (sometimes by a registered undertaker, in a formally proclaimed cemetery);
- Observation of rituals or ceremonies required by the families.

Movable objects: This includes objects such as historic or rare books and manuscripts, paintings, drawings, sculptures, statuettes and carvings; modern or historic religious items; historic costumes, jewellery and textiles; fragments of monuments or historic buildings; archaeological material; and natural history collections such as shells, flora, or minerals. Discoveries and access resulting from a project may increase the vulnerability of cultural objects to theft, trafficking or abuse. This may include any of the following:

1) Objects recovered from the soil or water including archaeological and paleontological objects and material, meteorites and rare geological specimens;
2) Ethnographic art and objects
3) Military objects
4) Objects of decorative art
5) Objects of fine art
6) Objects of scientific or technological interest
7) Books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings
8) Any other prescribed categories, but excluding any object made by a living person.

Protection of Historic Battlefields

Heritage "Places": A 'place' is defined as:

a) A site, area or region;
b) A building or other structure (which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure);
c) A group of buildings or other structures (which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures); and
d) An open space, including a public square, street or park; and in relation to the management of a place, includes the immediate surroundings of a place.
e) Traditional Buildings used in cultural ceremonies.

Heritage Structures: Refers to single or groups of architectural works found in urban or rural settings providing evidence of a particular civilisation, a significant development or a historic event. It includes groups of buildings, structures and open spaces constituting past or contemporary human settlements that are recognised as cohesive and valuable from an architectural, aesthetic, spiritual or socio-cultural perspective. This may also include any building, works, device, or other facility made by people and which is fixed to land and any fixtures, fittings and equipment associated therewith older than 60 years.

Archaeological Sites

Archaeological sites comprise any combination of structural remains, artefacts, human or ecological elements and may be located entirely beneath, partially above, or entirely above the land or water surface. Archaeological material may be found anywhere on the earth's surface, singly or scattered over large areas. Such material includes burial areas, human remains, artefacts and fossils. Archaeological sites may include:

a) Material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
b) Rock art, being a form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and is older than 100 years including any area within 10 m of such representation; and
c) Wrecks, being any vessel or aircraft, or any part thereof, which was wrecked, whether on land or in the maritime cultural zone, and any cargo, debris or artefacts found or associated therewith, which are older than 60 years or which in terms of national legislation are considered to be worthy of conservation;

d) Features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

Paleontological resources: Refers to any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

Sacred or Spiritual Sites: Refers to natural features with cultural significance, which may include sacred hills, mountains, landscapes, streams, rivers, waterfalls, caves and rocks; sacred trees or plants, groves and forests; carvings or paintings on exposed rock faces or in caves; and paleontological deposits of early human, animal or fossilised remains. This heritage may have significance to local community groups or minority populations.

1.4 Geographical / Spatial Scope of HIA

The geographic and spatial scope of the HIA centres on the proposed demolishing of structures located on Portion 1 and Remainder of Erf 705 on the Farm Klipfontein 203 in Ferndale, Randburg, Ekurhuleni Metropolitan Municipality, Gauteng Province.

Any sites within the directly impacted study areas that can be affected by the proposed development and, where known, are included in this report. Mitigation or secondary investigations take this footprint as the spatial parameters of the study area.

1.5 Temporal Scope

The proposed project will consist of three phases;

1) Planning
2) Development
3) Operational

Due to the nature of the proposed development, impacts on heritage sites are only anticipated during the development phase of the proposed project. The operational phase will not result in any further alterations to heritage on any significant scale.

2. Legislative Context

2.1 National Legislation

Section 38(1) of the South African Heritage Resources Act (25 of 1999) requires that a heritage study is undertaken for:

a) Construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
b) Construction of a bridge or similar structure exceeding 50 m in length; and
c) Any development, or other activity which will change the character of an area of land, or water –
    1) Exceeding 10 000 m^2 in extent;
    2) Involving three or more existing erven or subdivisions thereof; or
    3) Involving three or more erven, or subdivisions thereof, which have been consolidated within the past five years; or
d) The costs of which will exceed a sum set in terms of regulations; or
e) Any other category of development provided for in regulations.

While the above describes the parameters of developments that fall under this Act., Section 38 (8) of the NHRA is applicable to this development. This section states that;

(8) *The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.*

In regard to a development such as this that falls under Section 38 (8) of the NHRA, the requirements of Section 38 (3) applies to the subsequent reporting, stating that;

(3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2) (a): Provided that the following must be included:
    a) The identification and mapping of all heritage resources in the area affected;
    b) An assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6 (2) or prescribed under section 7;
    c) An assessment of the impact of the development on such heritage resources;
    d) An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
    e) The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
    f) If heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
    g) Plans for mitigation of any adverse effects during and after the completion of the proposed development.
        1. Ancestral graves,
        2. Royal graves and graves of traditional leaders,
        3. Graves of victims of conflict (iv) graves of important individuals,
        4. Historical graves and cemeteries older than 60 years, and
        5. Other human remains which are not covered under the Human Tissues Act, 1983 (Act No.65 of 1983 as amended);
    h) Movable objects, including ;

1. Objects recovered from the soil or waters of South Africa including archaeological and paleontological objects and material, meteorites and rare geological specimens;
2. Ethnographic art and objects;
3. Military objects;
4. Objects of decorative art;
5. Objects of fine art;
6. Objects of scientific or technological interest;
7. Books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings; and
8. Any other prescribed categories, but excluding any object made by a living person;

i) Battlefields;
j) Traditional building techniques.

A '**place**' is defined as:

a) A site, area or region;
b) A building or other structure (which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure);
c) A group of buildings or other structures (which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures); and (d) an open space, including a public square, street or park; and in relation to the management of a place, includes the immediate surroundings of a place.

'**Structures**' means any building, works, device, or other facility made by people and which is fixed to land and any fixtures, fittings and equipment associated therewith older than 60 years.

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d) Features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

'Paleontological' means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

'Grave' means a place of interment and includes the contents, headstone or other marker of and any other structures on or associated with such place. The South African Heritage Resources Agency (SAHRA) will only issue a permit for the alteration of a grave if it is satisfied that every reasonable effort has been made to contact and obtain permission from the families concerned.

The removal of graves is subject to the following procedures as outlined by the SAHRA:

- Notification of the impending removals (using English, Afrikaans and local language media and notices at the grave site);
- Consultation with individuals or communities related or known to the deceased;
- Satisfactory arrangements for the curation of human remains and / or headstones in a museum, where applicable;
- Procurement of a permit from the SAHRA;

- Appropriate arrangements for the exhumation (preferably by a suitably trained archaeologist) and re-interment (sometimes by a registered undertaker, in a formally proclaimed cemetery);
- Observation of rituals or ceremonies required by the families.

The limitations and assumptions associated with this heritage impact assessment are as follows;

- Sites were evaluated by means of description of the cultural landscape, direct observations and analysis of written sources and available databases.
- It was assumed that the site layout as provided by the consultant is accurate.
- We assumed that the public participation process performed as part of the Basic Assessment process was sufficiently encompassing not to be repeated in the Heritage Assessment Phase.

Table 1. Impacts on the NHRA Sections

Act	Section	Description	Possible Impact	Action
National Heritage Resources Act (NHRA)	34	Preservation of buildings older than 60 years	Yes	HIA, Phase 2 Assessment Recommended
	35	Archaeological, paleontological and meteor sites	No impact	None
	36	Graves and burial sites	No impact	None
	37	Protection of public monuments	No impact	None
	38	Does activity trigger a HIA?	Yes	HIA

Table 2. NHRA Triggers

Action Trigger	Yes/No	Description
Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length.	No	N/A
Construction of a bridge or similar structure exceeding 50m in length.	No	N/A
Development exceeding 5000 m^2	Yes	Portion 1 and Remainder of Erf 705 on the Farm Klipfontein 203 in Ferndale, Randburg. Approximately 0.803ha in extent.
Development involving more than 3 erven or sub divisions	No	N/A
Development involving more than 3 erven or sub divisions that have been consolidated in the past 5 years	No	N/A
Re-zoning of site exceeding 10 000 m^2	No	N/A
Any other development category, public open space, squares, parks or recreational grounds	No	N/A

3. Methodology

3.1 Heritage Management

This study defines the heritage component of the EIA process being undertaken for the proposed demolishing of structures located on Portion 1 and Remainder of Erf 705 on the Farm Klipfontein 203 in Ferndale, Randburg, Ekurhuleni Metropolitan Municipality, Gauteng Province.

It is described as a first phase (HIA). This report attempts to evaluate both the accumulated heritage knowledge of the area through means of archival research as well as information derived from direct physical observations.

3.2 Inventory

Inventory studies involve the in-field survey and recording of archaeological resources within a proposed development area. The nature and scope of this type of study is defined primarily by the results of the overview study. In the case of site-specific developments, direct implementation of an inventory study may preclude the need for an overview.

There are a number of different methodological approaches to conducting inventory studies. Therefore, the proponent, in collaboration with the archaeological consultant, must develop an inventory plan for review and approval by the SAHRA prior to implementation (*Dincause, Dena F., H. Martin Wobst, Robert J. Hasenstab and David M. Lacy 1984)*.

3.3 Evaluating Heritage Impacts

A combination of document research as well as the determination of the geographic suitability of areas and the evaluation of aerial photographs determined which areas could and should be accessed.

After plotting of the site on a GPS the areas were accessed using suitable combinations of vehicle access and access by foot.

Sites were documented by digital photography and geo-located with GPS readings using the WGS 84 datum. An aerial drone was used to evaluate the site from different heights and to improve coverage of the area.

Further techniques (where possible) included interviews with local inhabitants, visiting local museums and information centers and discussions with local experts. All this information was combined with information from an extensive literature study as well as the result of archival studies based on the SAHRA (South African Heritage Resource Agency) provincial databases.

This Heritage Impact Assessment relies on the analysis of written documents, maps, aerial photographs and other archival sources combined with the results of site investigations and interviews with affected people. Site investigations are not exhaustive and often focus on areas such as river confluence areas, elevated sites or occupational ruins.

The following documents were consulted in this study;

- South African National Archive Documents
- SAHRIS (South African Heritage Resources Information System) Database of Heritage Studies
- Historic Maps
- 1939, 1954, 1975, 1983, 2002 and 2010 Surveyor General Topographic Map series
- 1952 1:10 000 aerial photo survey
- Google Earth 2020 imagery
- Published articles and books
- JSTOR Article Archive

3.4 Assumptions

It was assumed that the impacted areas will be limited to the proposed development. It is furthermore assumed that the *PaleoSensitivity* Map provided on the SAHRIS platform is comprehensive enough to inform on actions in this regard.

3.5 Gaps / Limitations / Uncertainty

The area is readily accessible.

3.6 Specialist Specific Methodology

The scope of work includes:

- the identification and assessment of archaeological, cultural, historic, built and paleontological sites within the study area.
- Archival study of existing data and information for the study area.
- Impact assessment has been performed according to the methodology as described in the relevant Section.

4. Description of Affected Environment

4.1 Baseline

Context Relevant to Project Location, Design, Operation, or Mitigation Decisions

4.1.1 Palaeontology

The palaeontology of Western Gauteng is professionally researched in areas. The discovery of the Sterkfontein skeletons put this area in the forefront of palaeontology worldwide. The rule of "absence of evidence is not evidence of absence" should be applied to this area. Taken the rich palaeontology of Western Gauteng it is conceivable that similar finds could be made in this area.

The study area falls within the grey designation, indicating that the significance of the study area is zero and no Palaeontological studies are required.

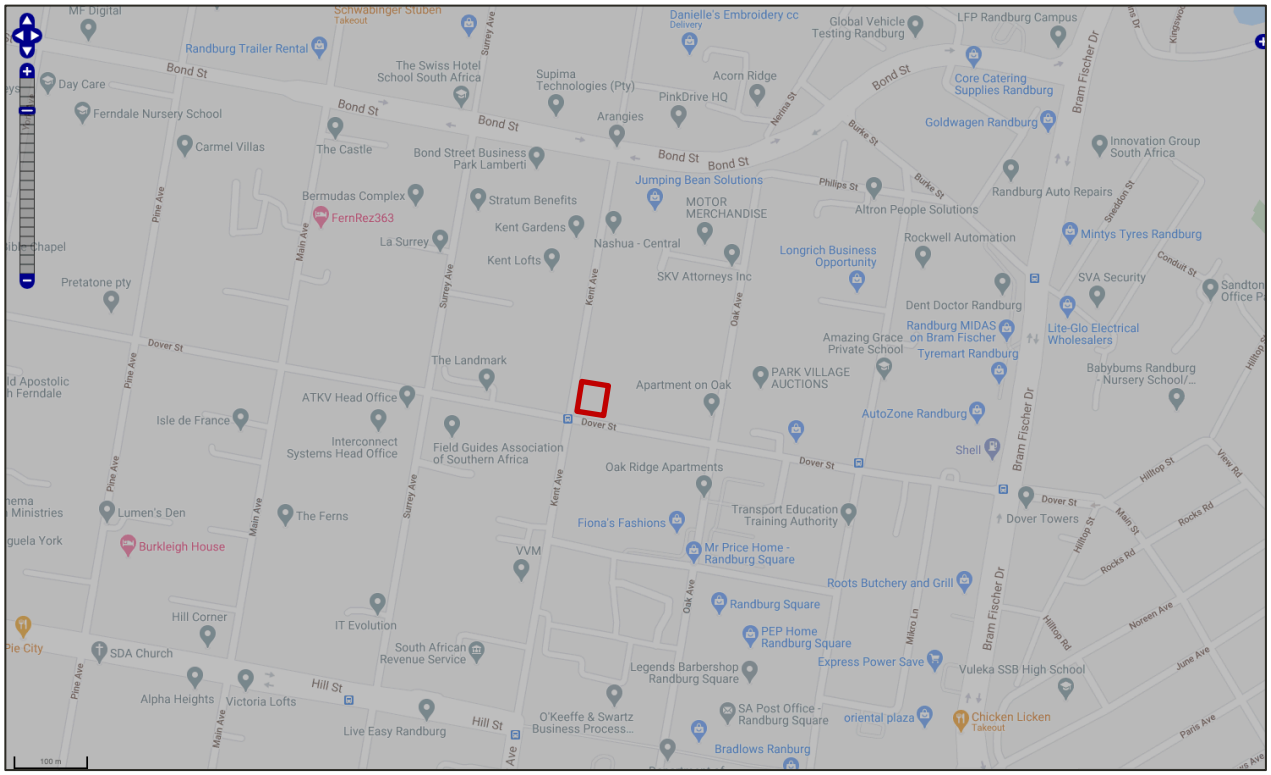

Figure 3. Paleo Sensitivity Map

Table 3. Palaeontological Sensitivity

Colour	Sensitivity	Action Required
RED	VERY HIGH	Field assessment and protocol for finds is required.
ORANGE / YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely.
GREEN	MODERATE	Desktop study is required.
BLUE	LOW	No Palaeontological studies are required however, a protocol for finds is required.
GREY	INSIGNIFICANT / ZERO	No Palaeontological studies are required.
WHITE / CLEAR	UNKNOWN	These area will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

4.1.2 Stone Age

No substantial number of Stone Age sites from any period of the Stone Age is known to exist in this area – primarily as a result of a lack of research and general ignorance amongst the layman in recognizing stone tools that often may occur. However, it is possible that the first humans in the Benoni area may have been preceded by Homo erectus, who roamed large parts of the world during the Aucheulian period of the Early Stone Age, 500 000 years ago. The predecessors of Homo erectus, Australopithecus, which is considered to be the earliest ancestor of modern humans, lived in the Blaauwbank Valley around Krugersdorp (today part of the Cradle of Humankind – a World Heritage Site) several million years ago.

During the Middle Stone Age, 200 000 years ago, modern man or Homo sapiens emerged, manufacturing a wider range of tools, with technologies more advanced than those from earlier periods. This enabled skilled hunter-gatherer bands to adapt to different environments. From this time onwards, rock shelters and caves were used for occupation and reoccupation over very long periods of time (Mitchell 2002). Two Middle Stone Age sites at the Withoek Spruit (Brakpan) were researched 17 years ago, but no information on this discovery has been published.

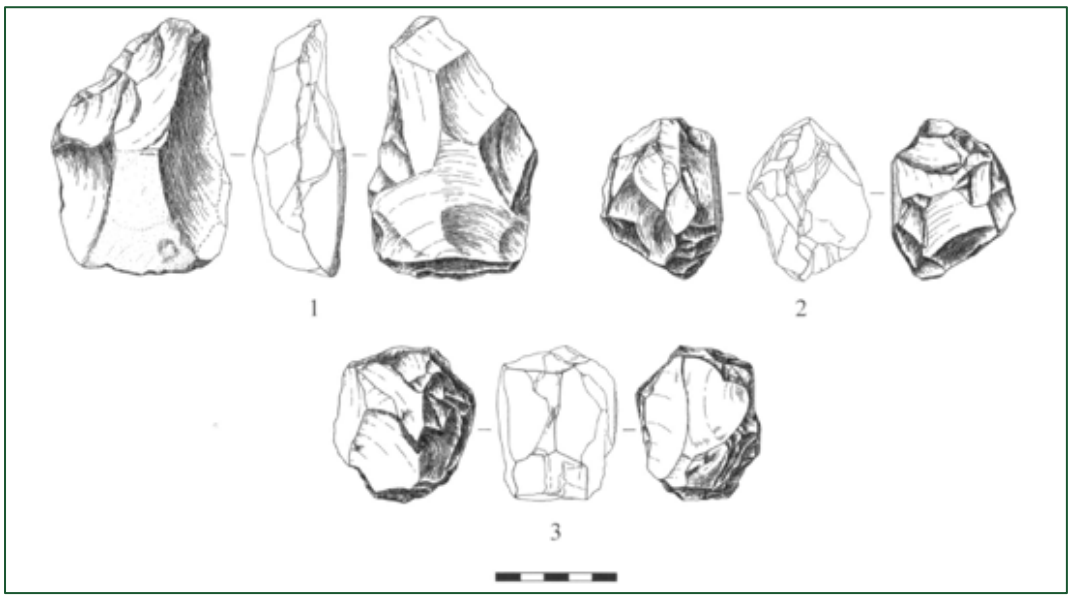

Figure 4. (1) handaxe on flake; (2) thick discoidal core; (3) polyhedral core (Pollarolo, Kuman, Bruxelles, 2010)

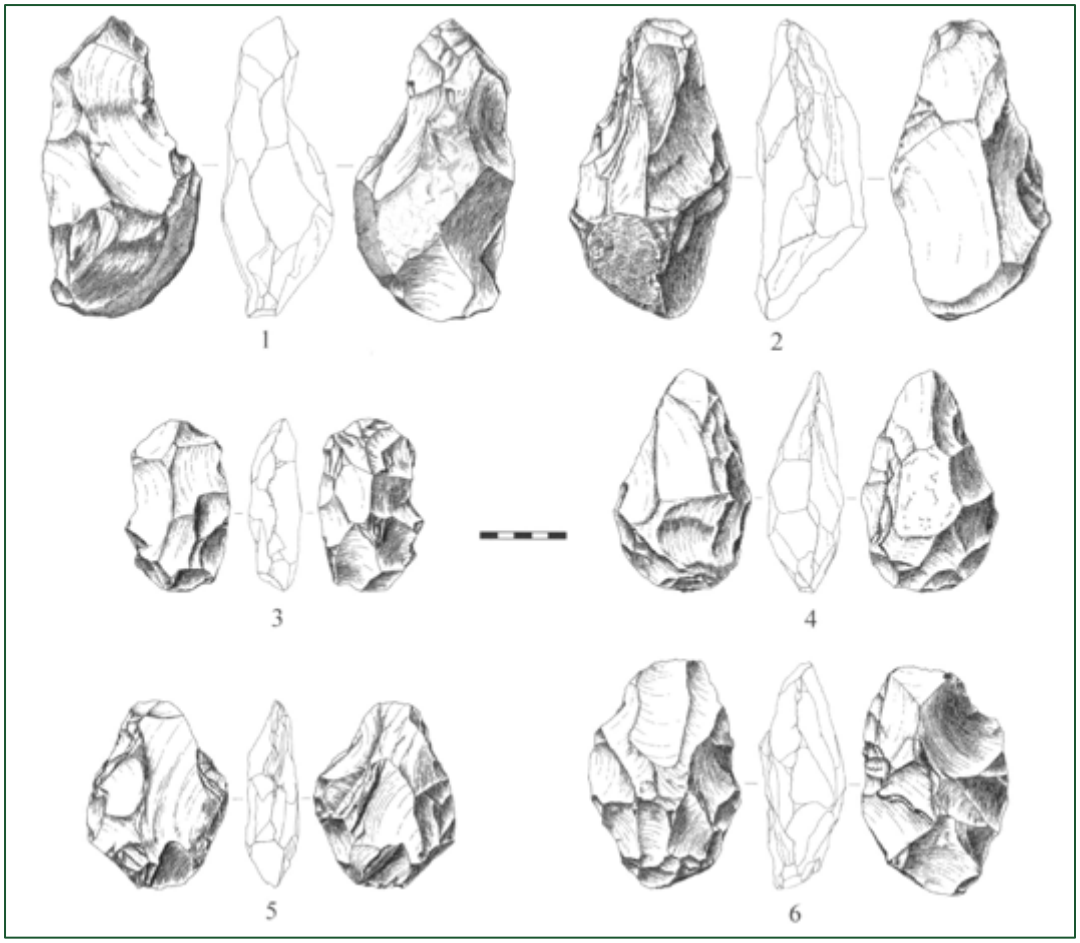

Figure 5. (1,2) Handaxes with large side removal; (3-6) handaxes (Pollarolo, Susino, Kuman, Bruxelles, 2010)

The Late Stone Age, considered to have started some 20 000 years ago, is associated with the predecessors of the San and Khoi Khoi. San hunter-gatherer bands with their small (microlithic) stone tools may have lived in Eastern Gauteng, as a magnificent engraving site near Duncanville attests to their presence in Vereeniging, south of, but close to Ekurhuleni. Stone Age hunter-gatherers lived well into the 19th century in some places in SA, but may not have been present in Brakpan when the first European colonists crossed the Vaal River during the early part of the 19th century Stone Age sites may occur all over the area where an unknown number may have been obliterated by mining activities, urbanization, industrialization, agriculture and other development activities during the past decades (Morris 2004).

4.1.3 Iron Age

A considerable number of Late Iron Age, stone walled sites, dating from the 18th and the 19th centuries (some of which may have been occupied as early as the 16th century), occur along and on top of the rocky ridges of the eastern part of the Klipriviersberg towards Alberton. These settlements and features in these sites, such as huts, were built with dry stone, reed and clay available from the mountain and the Klip River (Mason 1968, 1986).

The Late Iron Age sites within Ekurhuleni's south-eastern border are a 'spill-over' from a larger concentration which are located further towards the west, in the Witwatersrand, while large concentrations of stone walled sites are also located directly to the south of Johannesburg, in the mountainous area around the Suikerbosrand in Heidelberg. The stone walled settlements are concentrated in clusters of sites and sometimes are dispersed over large areas making them vulnerable to developments of various kinds. A site consists of a circular or elliptical outer wall that is composed of a number of scalloped walls facing inwards towards one or more enclosures. Whilst the outer scalloped walls served as dwelling quarters for various family groups, cattle, sheep and goat were stocked in the centrally located enclosures. Huts with clay walls

and floors were built inside the dwelling units. Pottery and metal items are common on the sites. However, iron and copper were not produced locally on these sites (Killick 2004).

Some 100 years earlier, African farmers in the Fokeng cluster built stonewalled settlements in the Tshwane area that emphasised the centre/side axis. From the air, these earlier settlements resemble a 'fried egg'; that is, a smooth outer ring about 60 metres across enclosed in a central cattle byre about 20 metres in diameter. This type has its origins among BaFokeng living near the hill Ntsuanatsatsi in the Free State (see pre history of Bloemfontein). When these early BaFokeng people moved north across the Vaal River, they met the ancestors of Southwest Sotho-Tswana, such as BaRolong and BaThlaping. Their interaction helped to create a new type of stonewalling called Klipriviersburg. Besides Johannesburg, Klipriviersburg walling is also found around Pretoria. All of these people were mixed farmers; that is, they herded cattle as well as sheep and goats, and they cultivated sorghums, millets and various beans and peas. They were also capable of making metal tools and jewellery.

The earliest evidence of metal working in the region comes from the site Broederstroom west of Pretoria. Archaeologists have uncovered the remains of at least two stratified villages there that date back to between AD 550 and 700, each with evidence of iron forging. Two major technological steps characterise ancient iron production: smelting and forging. Technically, iron ore is reduced in a furnace to create a bloom. During this smelting process, silica in the host rock melts, flowing off as slag leaving the bloom behind. The bloom has to be forged in an oxidised atmosphere, usually in an open hearth. In both smelting and forging, bellows attached to clay pipes help the operators reach the necessary high temperatures. Culturally, Bantu-speaking people in the recent past compared the smelting process to childbirth, a private and sacred affair. Consequently, the smelter was usually secluded outside the settlement. Forging, in contrast, was comparable to raising the child; and so the forge was located in a public area in the centre of the homestead. The forges at Broederstroom follow this pattern. (http://www.sahistory.org.za/topic/prehistory-pretoria)

4.1.4 Historic Era

Farming people did not inhabit the Greater Johannesburg region until the Late Iron Age. Then, beginning in the 15th century, BaFokeng dominated the landscape. A few other Sotho-Tswana people, most notably BaKwena, also lived in the region. Large, stonewalled settlements of both BaKwena and BaFokeng characterised the troubled times of the *difaqane / mfecane* at the end of the 18th century. Mzilikazi, however, depopulated the region in 1823; and so, the land appeared empty when Voortrekkers arrived.

The first Voortrekker parties crossed the Vaal River and started occupying the area in the 1830's. Farmers started moving into the area and declared farms for themselves, especially after the singing of the Sand River convention in 1852.

The evolution of the region *Southern Transvaal,* its industrial development, rate of urban development and settlement pattern were greatly influenced by geology and mining, following the discovery of gold deposits in 1886.

The first major modern settlements in Johannesburg were loosely planned, as they grew up quickly in order to service the need for labour in the gold mines on the Witwatersrand. However, the population of Johannesburg increased rapidly, and the city quickly established formal neighbourhoods, most of which were racially mixed as labourers lived together. The earliest formal settlement to house people of all races, Kliptown, is located near today's Soweto.

Many large freeways were built to link Johannesburg with the rest of South Africa, although this permitted the further outward expansion of the city along the N1, N3, and M2 roadways. Public transport construction was completely abandoned, except for a minor bus system.
This system continued until the 1980s, when international sanctions and a poor security situation led to a large contraction in the economy. Many companies abandoned skyscrapers that had been built in the Central Business District (CBD) in the 1960s and 1970s, and left warehouses empty or little used.

When the Group Areas Act was repealed, there was a mass migration of former township dwellers and illegal immigrants to buildings in the CBD and surrounding areas, which caused crime rates to increase dramatically in the Central area of the city. Many businesses that had not closed their CBD offices left for more secured Northern suburbs, and in particular, Sandton. The amount of business and population of the

northern suburbs increased exponentially, while the CBD was left empty and abandoned as a "no-go zone". The previous owners of buildings in the CBD abandoned them as their value decreased, and more illegal immigrants moved in. Many suburbs near the CBD also felt the demographic change as previously white and middle-class suburbs like Yeoville became mostly black and dangerous within the space of two to three years.

The city government has attempted to rectify this situation as of 2005 by installing CCTV cameras all over the city centre and increasing police presence. Some businesses and residents have returned, although most businesses have built permanent and better facilities in the northern suburbs, so a large-scale return is unlikely. The city has grown so quickly to the north that the border between Johannesburg, Midrand, and Centurion is mostly an arbitrary political border, as the two cities have grown together so there is no space between them.

Sources:
http://www.sacp.org.za/docs/history/fifty3.html
http://www.historyworld.net/wrldhis/PlainTextHistories.asp?ParagraphID=otw
http://cals.ukzn.ac.za/Libraries/General_Docs/Mbulelo_Mzamane.sflb.ashx
http://www.sahistory.org.za/people/david-wilcox-bopape
http://www.liferattle.ca/radio/podcast20110213.html
Historyworld.net
SA History Online/Consumer Boycotts
SA Military History.org
Mbulelo Vizikhungo Mzamane, “Children of Paradise”

4.1.5 SAHRIS Database Studies

An extensive research into the SAHRIS database resulted in the identification of the following heritage related studies that have been performed over the last decade in the study area. Only studies within a radius of 50km from the study area were considered.

- Roodt, F. 2020. Phase 1 Heritage Impact Assessment Report. Proposed Bryanston Extension 3 Project A Township Development within the City of Johannesburg Metropolitan Municipality, Gauteng Province.
- Stegman, L. 2019. Proposed Rehabilitation of Drainage Line on Municipal Property next to 16 Bruce Close, Bryanston, Gauteng.
- Fourie, W. 2008. Heritage Scoping: Proposed Upgrade of the Low Level Bridge on Hyperion Drive, North Riding, Gauteng Province.
- Schoeman, A., van Doornum, B. 2001. Archaeological Assessment for Needwood Extension 5.
- Pistorius, J. 2003. A Heritage Impact Assessment (HIA) Study for the Cell 13 on Portion 66 of the Farm Modderfontein 35 IR in the Gauteng Province of South Africa.
- Van der Walt, J. 2008. Heritage Scoping: Proposed Development on Part of Portion 23, Portion 69 and the Remainder of Portion 22 and 36 of the Farm Klipfontein 12 IR, Ekurhuleni, Gauteng Province.
- Pelser, A. 2017. Report on a Desktop Cultural Heritage Assessment for the Proposed Houghton Estate Extension 1 Residential Development Located on the Remaining Extent of Portion 1 of Houghton Estate 56IR, Houghton, Gauteng.
- Van Der Walt, J. 2017. Notification of Intent to Develop for the Proposed Upgrading of Jan Smuts Road to Dual Carriage Way from Northworth Drive to Bolton Road and from 8th Avenue to Kent Road, Rosebank, Johannesburg, Gauteng Province.
- Coetzee, F.P. 2016. Cultural Heritage Assessment of the Proposed 37.5 ML Underground Linksfield Reservoir, City of Johannesburg, Gauteng Province.
- Coetzee, F.P. 2015. Cultural Heritage Assessment of the Proposed Construction of the Additional Meredale Reservoir (210 Ml) (Eikenhof System), City of Johannesburg Metropolital Municipality, Gauteng.
- Kusel, U. 2016. Phase 1 Cultural Heritage Resources Impact Assessment for the Proposed Development on Portions of the Klipspruit Township, Nancefield Precint, Soweto, Johannesburg, Gauteng Province.
- Van Ryneveld, K. 2015. HIA – Construction of the Celebration Sewer Pipeline B on Various Agricultural Holdings, North Riding, City of Johannesburg Metropolitan Municipality, Gauteng.

- De Jong, R.C. 2014. Final Heritage Impact Assessment Report Version 3: Proposed Huddle Park Golf Course Development, Johannesburg.
- Kruger, N. 2017. Archaeological Impact Assessment (AIA) of areas demarcated for the Proposed Zandspruit Township Establishment on Portions 16, 22, 23, 26, 42, 51, 55, 56, 59, 67, 68, 72, 73, 76, 104, 105, 144 and 160 of the Farm Zandspruit 191-IQ and Holding 43 Sonedal, A.H., City of Johannesburg, Gauteng Province.
- Birkholtz, P. 2015. Proposed Development of the G14 Pipeline by Rand Water: Heritage Impact Assessment for the Proposed Development of the G14 Pipeline between Forest Hill and Turffontein Nek, Southern Johannesburg, Johannesburg Metropolitan Municipality, Gauteng Province.
- Van Schalkwyk, J. 2006. Review of Cultural Heritage Resources in the Modderfontein Area, East of Johannesburg, Gauteng.
- Breetzke, S. 2014. Proposed Alternations and Additions to House Breetzke – Erf 120 & 121 of Forest Town, Gauteng, 5 Cluny Road, Johannesburg.
- Van Schalkwyk, J. 2015. Heritage Impact Assessment for the Proposed Widening of Conrad Drive Bridge and Erosion Protection Measures, Braamfontein Spruit, Blairgowrie, Johannesburg District Municipality, Gauteng Province.

4.2 Relevance of Listed Heritage Studies for the Current Study

All the studies performed within the vicinity of the current study area which could be found on the SAHRIS website indicated no sites of any heritage significance. Taking into account that none of the 18 referenced studies could identify any sites of heritage significance it can be assumed with a high level of certainty that the general area within which the current study falls has a distinct lack of heritage value.

4.3 Historical Typographical Maps

Especially during the evaluation of historic structures, the use of archived historic maps is very handy. They give a direct chronological reference for such sites and also lead the investigation on the ground.

The following historic map sets are relevant for this study (in chronological order);

- 2628AA_1939
- 2628AA_1954
- 2628AA_1975
- 2628AA_1983
- 2628AA_2002
- 2628AA_2010

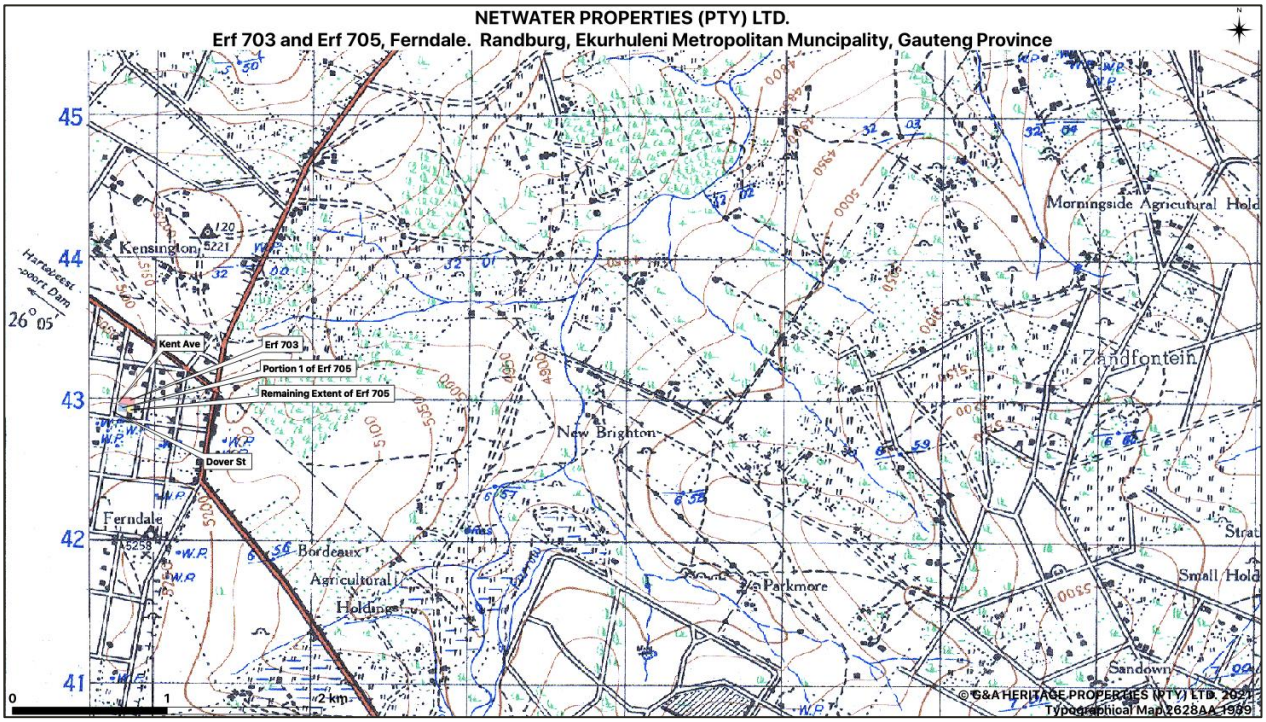

Figure 6. Topographic Map 2628AA_1939

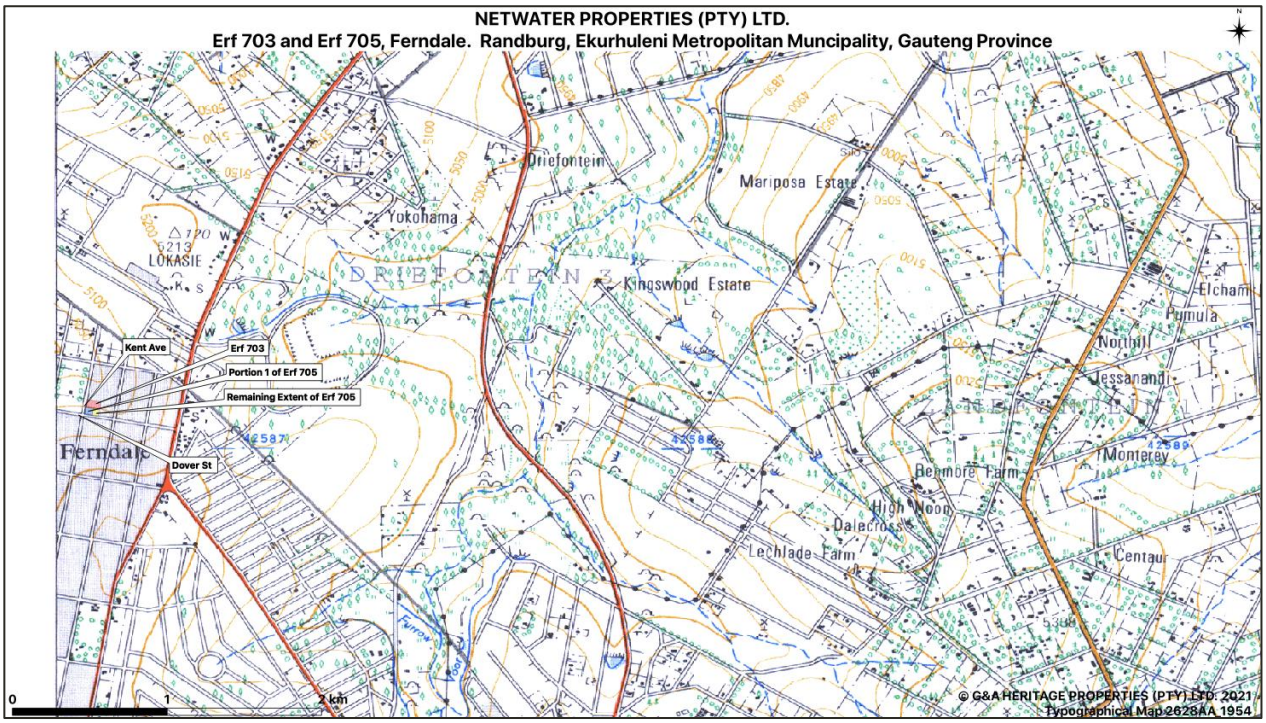

Figure 7. Topographic Map 2628AA_1954

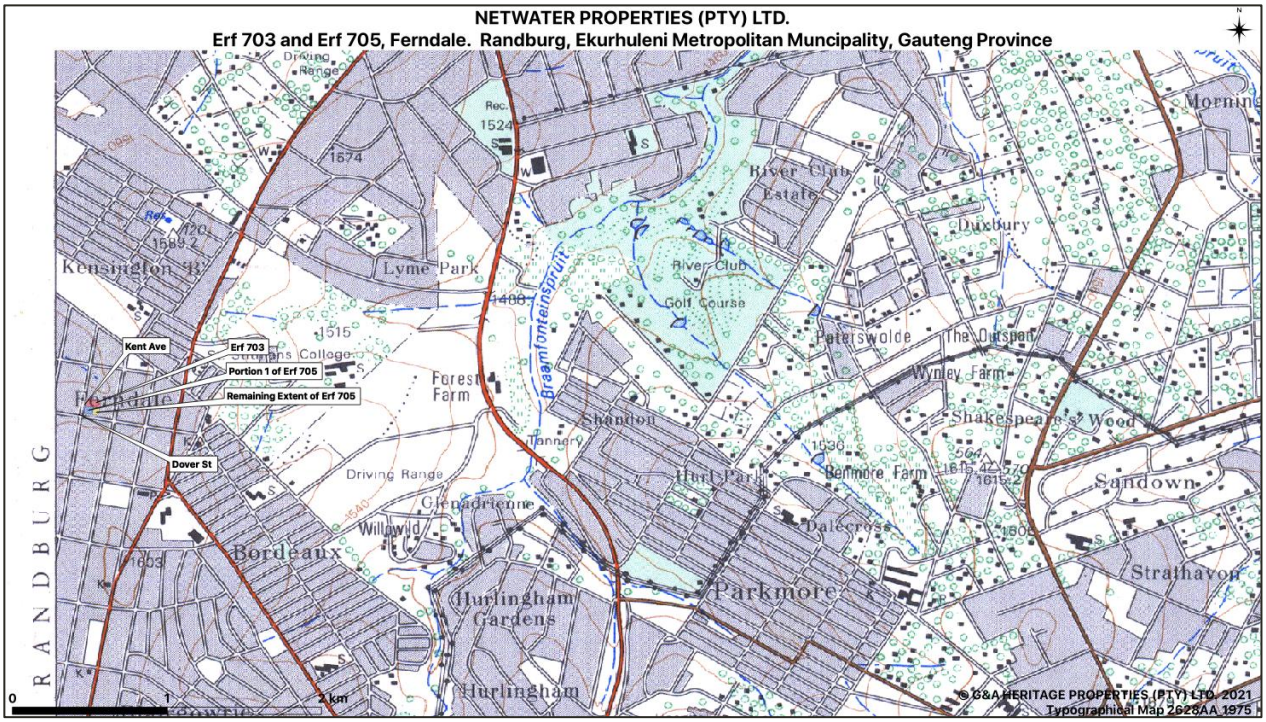

Figure 8. Topographic Map 2628AA_1975

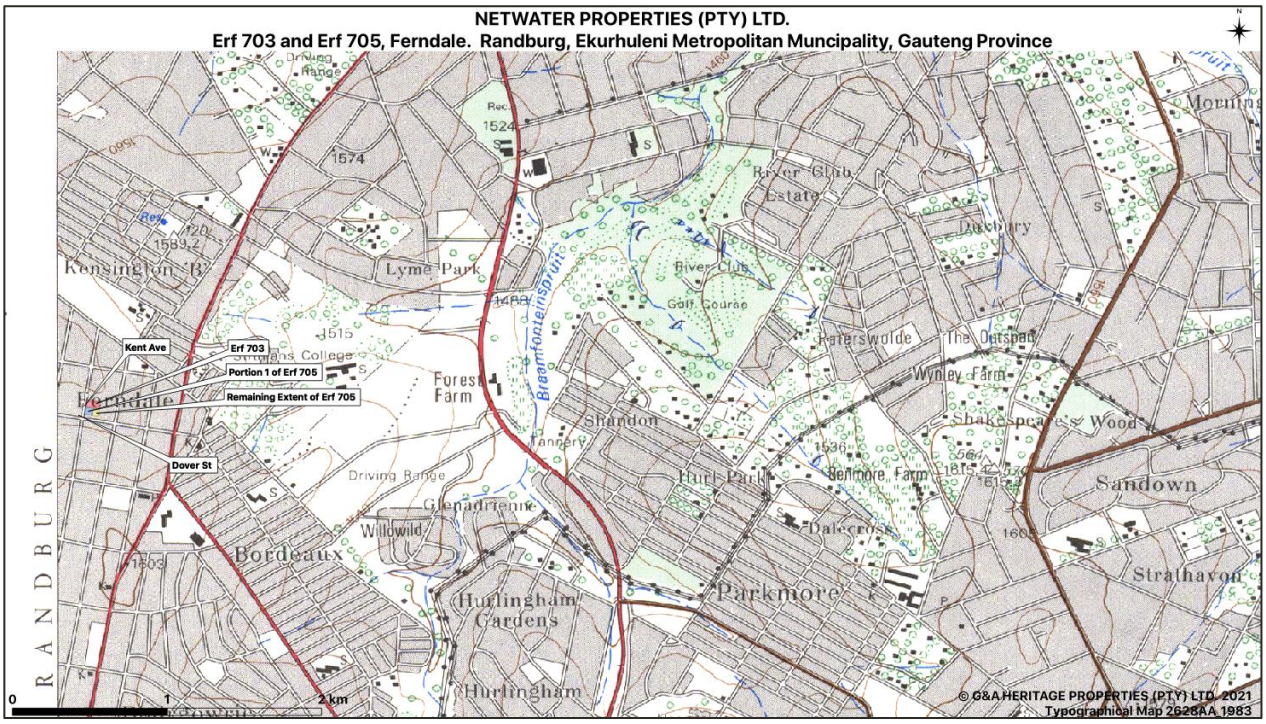

Figure 9. Topographic Map 2628AA_1983

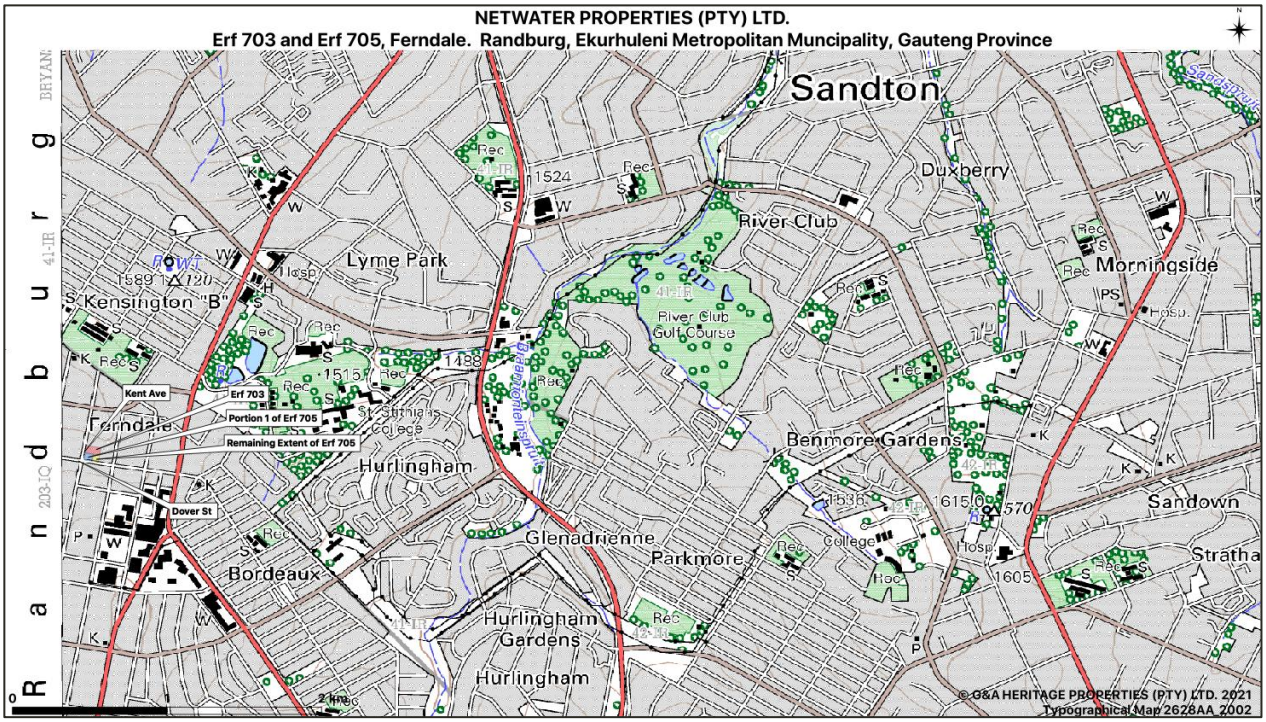

Figure 10. Topographic Map 2628AA_2002

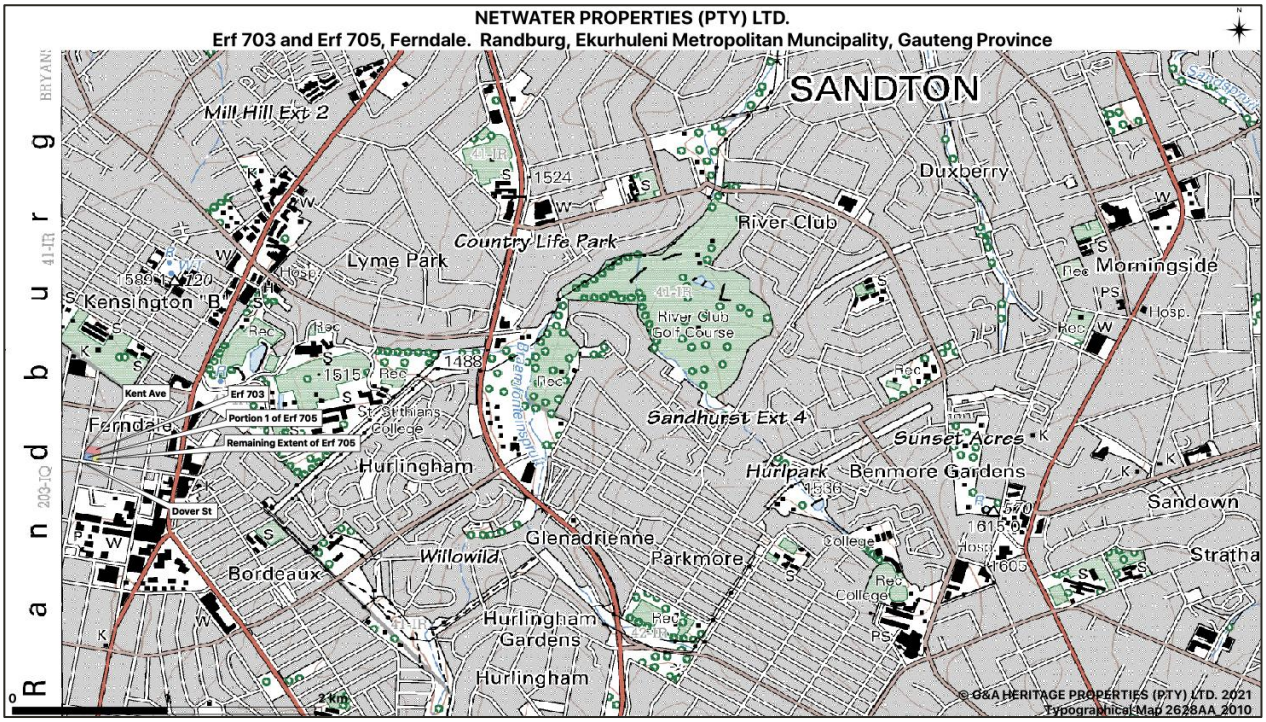

Figure 11. Topographic Map 2628AA_2010

4.4 Cultural Landscape & Existing Land Use

The area can be described as an urban environment with office blocks, shops, businesses and residential homes and complexes. It is close to Sandton with its main route, William Nicol, extending to Bryanston and Fourways.

Even though the buildings on site are older than 60 years, these are in a dilapidated state and poses a risk to inhabitants due to its unsound condition.

5. Findings

The areas have been mostly disturbed from green field condition and can be described as an urban area.

5.1 Pre-Contact Sites

No Pre-Contact Sites could be identified within the study areas as a result of agricultural activities.

5.2 Post-Contact Sites

No Post-Contact Sites could be identified within the study areas as a result of agricultural activities and the general severe alterations to the landscape.

5.3 Built Environment

- Erf 703 Ferndale Township (355 Kent Avenue), measuring 4 015m^2;
- Portion 1 of Erf 705 Ferndale (351 Kent Avenue), measuring 2 007m^2;
- and Remaining Extent of Erf 705 Ferndale (21 Dover Street), measuring 2 008m^2.

The building on Erf 703 will not be part of the demolition application.

These neighbourhood, streets and structures appears on the 1939 Typographical Map and one can thus assume that these are at least 82 years old. The structures are thus protected by the NHRA Section 34 – *Preservation of buildings older than 60 years.* That said, the buildings are in a dilapidated state and poses a risk to inhabitants due to its unsound condition. The structures also seem to have been severely altered through the years and little of its original character remains. These structures therefore do not represent a unique example of the area's architectural history.

Figure 12. Erf 703 Ferndale Township (355 Kent Avenue)

Figure 13. Erf 703 Ferndale Township (355 Kent Avenue)

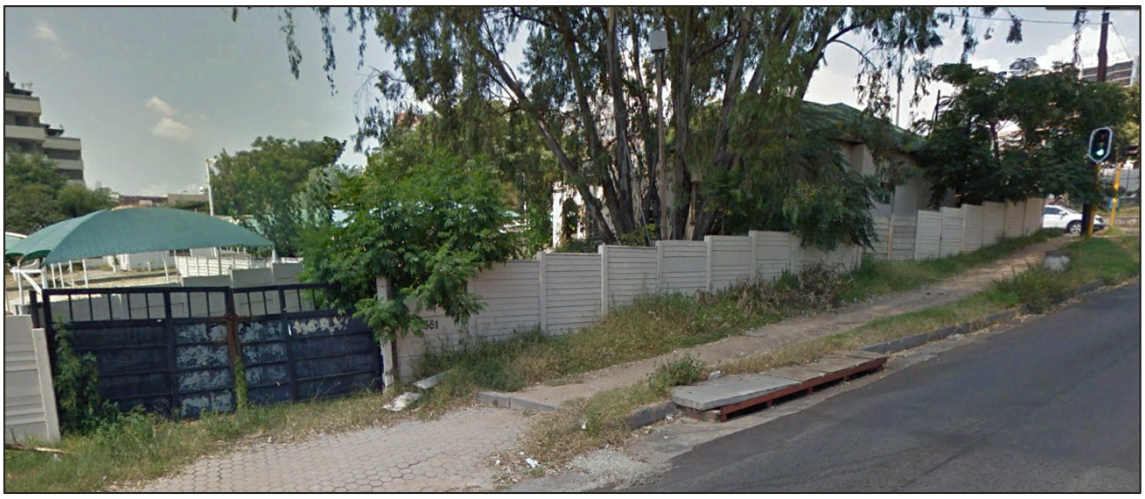

Figure 14. Portion 1 of Erf 705 Ferndale (351 Kent Avenue)

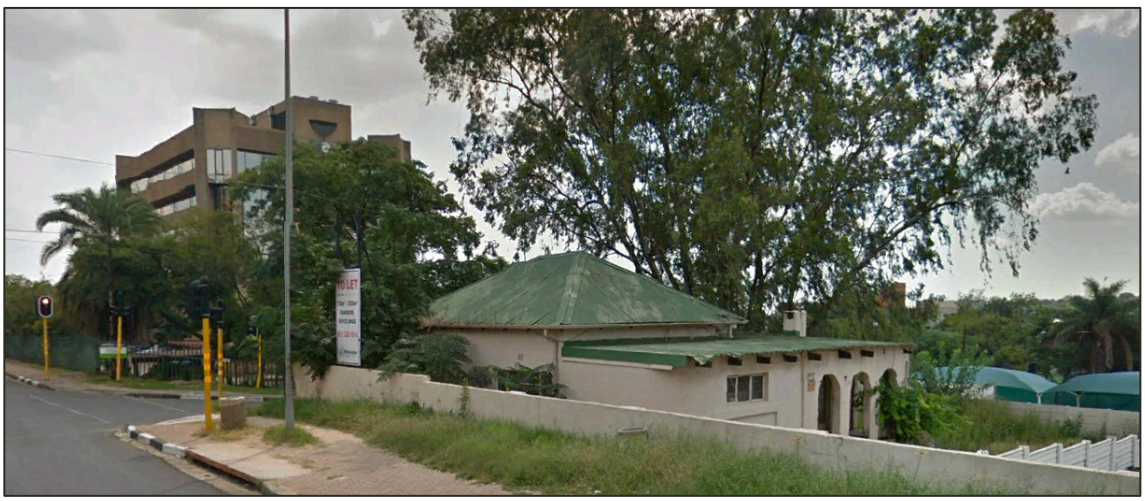

Figure 15. Portion 1 of Erf 705 Ferndale (351 Kent Avenue)

Figure 16. Portion 1 of Erf 705 Ferndale (351 Kent Avenue)

Figure 17. Portion 1 of Erf 705 Ferndale (351 Kent Avenue)

Figure 18. Remaining Extent of Erf 705 Ferndale (21 Dover Street)

Figure 19. Remaining Extent of Erf 705 Ferndale (21 Dover Street)

Figure 20. Remaining Extent of Erf 705 Ferndale (21 Dover Street)

(See Addendum 1 for full photographic record.)

6. Potential Heritage Impacts and Proposed Mitigation

6.1 Assessment of Heritage Potential

6.1.1 Assessment Matrix

Determining Archaeological Significance

In addition to guidelines provided by the National Heritage Resources Act (Act No. 25 of 1999), a set of criteria based on Deacon (J) and Whitelaw (1997) for assessing archaeological significance has been developed for Eastern Cape settings (Morris 2007a). These criteria include estimation of landform potential (in terms of its capacity to contain archaeological traces) and assessing the value to any archaeological traces (in terms of their attributes or their capacity to be construed as evidence, given that evidence is not given but constructed by the investigator).

Estimating site potential

Table 4 (below) is a classification of landforms and visible archaeological traces used for estimating the potential of archaeological sites (after J. Deacon and, National Monuments Council). Type 3 sites tend to be those with higher archaeological potential, but there are notable exceptions to this rule, for example the renowned rock engravings site Driekopseiland near Kimberley which is on landform L1 Type 1 – normally a setting of lowest expected potential. It should also be noted that, generally, the older a site the poorer the preservation, so that sometimes any trace, even of only Type 1 quality, could be of exceptional significance. In light of this, estimation of potential will always be a matter for archaeological observation and interpretation.

Table 4. Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon, NMC as used in Morris)

Class	Landform	Type 1	Type 2	Type 3
L1	Rocky Surface	Bedrock exposed	Some soil patches	Sandy/grassy patches
L2	Ploughed land	Far from water	In floodplain	On old river terrace
L3	Sandy ground, inland	Far from water	In floodplain or near features such as hill/dune	On old river terrace
L4	Sandy ground, coastal	>1 km from sea	Inland of dune cordon	Near rocky shore
L5	Water-logged deposit	Heavily vegetated	Running water	Sedimentary basin
L6	Developed urban	Heavily built-up with no known record of early settlement	Known early settlement, but buildings have basements	Buildings without extensive basements over known historical sites
L7	Lime/dolomite	>5 myrs	<5000 yrs	Between 5000 yrs and 5 myrs
L8	Rock shelter	Rocky floor	Loping floor or small area	Flat floor, high ceiling
Class	Archaeological traces	Type 1	Type 2	Type 3
A1	Area previously excavated	Little deposit remaining	More than half deposit remaining	High profile site
A2	Shell of bones visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick; shell and bone dense
A3	Stone artefacts or stone walling or other feature visible	Dispersed scatter	Deposit <0.5m thick	Deposit >0.5 m thick

Table 5. Site attributes and value assessment (adopted from Whitelaw 1997 as used in Morris)

Class	Landforms	Type 1	Type 2	Type 3
1	Length of sequence /context	No sequence Poor context Dispersed distribution	Limited sequence	Long sequence Favourable context High density of arte / ecofacts
2	Presence of exceptional items (incl. regional rarity)	Absent	Present	Major element
3	Organic preservation	Absent	Present	Major element
4	Potential for future archaeological investigation	Low	Medium	High
5	Potential for public display	Low	Medium	High
6	Aesthetic appeal	Low	Medium	High
7	Potential for implementation of a long-term management plan	Low	Medium	High

Assessing site value by attribute

Table 5 is adapted from Whitelaw (1997), who developed an approach for selecting sites meriting heritage recognition status in KwaZulu-Natal. It is a means of judging a site's archaeological value by ranking the relative strengths of a range of attributes (given in the second column of the table). While aspects of this matrix remain qualitative, attribute assessment is a good indicator of the general archaeological significance of a site, with Type 3 attributes being those of highest significance.

6.2 Impact Statement

6.2.1 Assessment of Impacts

A heritage resource impact may be broadly defined as the net change between the integrity of a heritage site with and without the proposed development. This change may be either beneficial or adverse.

Beneficial impacts occur wherever a proposed development actively protects, preserves or enhances a heritage resource. For example, development may have a beneficial effect by preventing or lessening natural site erosion. Similarly, an action may serve to preserve a site for future investigation by covering it with a protective layer of fill. In other cases, the public or economic significance of an archaeological site may be enhanced by actions, which facilitate non-destructive public use. Although beneficial impacts are unlikely to occur frequently, they should be included in the assessment.

More commonly, the effects of a project on heritage sites are of an adverse nature. Adverse impacts occur under conditions that include:

a) destruction or alteration of all or part of a heritage site;
b) isolation of a site from its natural setting; and
c) introduction of physical, chemical or visual elements that are out-of-character with the heritage resource and its setting.

Adverse effects can be more specifically defined as direct or indirect impacts. Direct impacts are the immediately demonstrable effects of a project which can be attributed to particular land modifying actions. They are directly caused by a project or its ancillary facilities and occur at the same time and place. The immediate consequences of a project action, such as slope failure following reservoir inundation, are also considered direct impacts.

Indirect impacts result from activities other than actual project actions. Nevertheless, they are clearly induced by a project and would not occur without it. For example, project development may induce changes in land use or population density, such as increased urban and recreational development, which may indirectly impact upon heritage sites. Increased vandalism of heritage sites, resulting from improved or newly

introduced access, is also considered an indirect impact. Indirect impacts are much more difficult to assess and quantify than impacts of a direct nature.

Once all project related impacts are identified, it is necessary to determine their individual level-of-effect on heritage resources. This assessment is aimed at determining the extent or degree to which future opportunities for scientific research, preservation, or public appreciation are foreclosed or otherwise adversely affected by a proposed action. Therefore, the assessment provides a reasonable indication of the relative significance or importance of a particular impact. Normally, the assessment should follow site evaluation since it is important to know what heritage values may be adversely affected.

The assessment should include careful consideration of the following level-of-effect indicators, which are defined below:

- magnitude
- severity
- duration
- range
- frequency
- diversity
- cumulative effect
- rate of change

6.3 Indicators of Impact Severity

Magnitude
The amount of physical alteration or destruction, which can be expected. The resultant loss of heritage value is measured either in amount or degree of disturbance.

Severity
The irreversibility of an impact. Adverse impacts, which result in a totally irreversible and irretrievable loss of heritage value, are of the highest severity.

Duration
The length of time an adverse impact persists. Impacts may have short-term or temporary effects, or conversely, more persistent, long-term effects on heritage sites.

Range
The spatial distribution, whether widespread or site-specific, of an adverse impact.

Frequency
The number of times an impact can be expected. For example, an adverse impact of variable magnitude and severity may occur only once. An impact such as that resulting from cultivation may be of recurring or on-going nature.

Diversity
The number of different kinds of project-related actions expected to affect a heritage site.

Cumulative Effect
A progressive alteration or destruction of a site owing to the repetitive nature of one or more impacts.

Rate of Change
The rate at which an impact will effectively alter the integrity or physical condition of a heritage site. Although an important level-of-effect indicator, it is often difficult to estimate. Rate of change is normally assessed during or following project construction.

The level-of-effect assessment should be conducted and reported in a quantitative and objective fashion. The methodological approach, particularly the system of ranking level-of-effect indicators, must be rigorously documented and recommendations should be made with respect to managing uncertainties in the assessment. *(Zubrow, Ezra B.A., 1984).*

In 2003 the SAHRA (South African Heritage Resources Agency) compiled the following guidelines to evaluate the cultural significance of individual heritage resources:

- **Type of Resource**
  - Place
  - Archaeological Site
  - Structure
  - Grave
  - Palaeontological Feature
  - Geological Feature

- **Type of Significance**

  - Historic Value
    - Important in the community, or pattern of history
    - Important in the evolution of cultural landscapes and settlement patterns
    - Important in exhibiting density, richness or diversity of cultural features illustrating the human occupation and evolution of the nation, province, region or locality.
    - Important for association with events, developments or cultural phases that have had a significant role in the human occupation and evolution of the nation, province, region or community.
    - Important as an example for technical, creative, design or artistic excellence, innovation or achievement in a particular period.
    - It has strong or special association with the life or work of a person, group or organisation of importance in history
    - Importance for close associations with individuals, groups or organisations whose life, works or activities have been significant within the history of the nation, province, region or community.
    - It has significance relating to the history of slavery
    - Importance for a direct link to the history of slavery in South Africa.

  - Aesthetic Value
    - It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group.
    - Important to a community for aesthetic characteristics held in high esteem or otherwise valued by the community.
    - Importance for its creative, design or artistic excellence, innovation or achievement.
    - Importance for its contribution to the aesthetic values of the setting demonstrated by a landmark quality or having impact on important vistas or otherwise contributing to the identified aesthetic qualities of the cultural environs or the natural landscape within which it is located.
    - In the case of an historic precinct, importance for the aesthetic character created by the individual components which collectively form a significant streetscape, townscape or cultural environment.

  - Scientific Value
    - It has potential to yield information that will contribute to an understanding of natural or cultural heritage
    - Importance for information contributing to a wider understanding of natural or cultural history by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.
    - Importance for information contributing to a wider understanding of the origin of the universe or of the development of the earth.
    - Importance for information contributing to a wider understanding of the origin of life; the development of plant or animal species, or the biological or cultural development of hominid or human species.

- Importance for its potential to yield information contributing to a wider understanding of the history of human occupation of the nation, Province, region or locality.
- It is important in demonstrating a high degree of creative or technical achievement at a particular period
- Importance for its technical innovation or achievement.

a) Does the site contain evidence, which may substantively enhance understanding of culture history, culture process, and other aspects of local and regional prehistory?

- internal stratification and depth
- chronologically sensitive cultural items
- materials for absolute dating
- association with ancient landforms
- quantity and variety of tool type
- distinct intra-site activity areas
- tool types indicative of specific socio-economic or religious activity
- cultural features such as burials, dwellings, hearths, etc.
- diagnostic faunal and floral remains
- exotic cultural items and materials
- uniqueness or representativeness of the site
- integrity of the site

b) Does the site contain evidence which may be used for experimentation aimed at improving archaeological methods and techniques?

- monitoring impacts from artificial or natural agents
- site preservation or conservation experiments
- data recovery experiments
- sampling experiments
- intra-site spatial analysis

c) Does the site contain evidence which can make important contributions to paleo environmental studies?

- topographical, geomorphological context
- depositional character
- diagnostic faunal, floral data

d) Does the site contain evidence which can contribute to other scientific disciplines such as hydrology, geomorphology, pedology, meteorology, zoology, botany, forensic medicine, and environmental hazards research, or to industry including forestry and commercial fisheries?

- Social Value / Public Significance
  - It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
  - Importance as a place highly valued by a community or cultural group for reasons of social, cultural, religious, spiritual, symbolic, aesthetic or educational associations.
  - Importance in contributing to a community's sense of place.

a) Does the site have potential for public use in an interpretive, educational or recreational capacity?

- integrity of the site
- technical and economic feasibility of restoration and development for public use
- visibility of cultural features and their ability to be easily interpreted
- accessibility to the public
- opportunities for protection against vandalism

- representativeness and uniqueness of the site
- aesthetics of the local setting
- proximity to established recreation areas
- present and potential land use
- land ownership and administration
- legal and jurisdictional status
- local community attitude toward development

b) Does the site receive visitation or use by tourists, local residents or school groups?

- Ethnic Significance
  Does the site presently have traditional, social or religious importance to a particular group or community?
  - ethnographic or ethno-historic reference
  - documented local community recognition or, and concern for, the site

- Economic Significance
  What value of user-benefits may be placed on the site?
  - visitors' willingness-to-pay
  - visitors' travel costs

- Scientific Significance
  a) Does the site contain evidence, which may substantively enhance understanding of historic patterns of settlement and land use in a particular locality, regional or larger area?
  b) Does the site contain evidence, which can make important contributions to other scientific disciplines or industry?

- Historic Significance
  a) Is the site associated with the early exploration, settlement, land use, or other aspect of southern Africa's cultural development?
  b) Is the site associated with the life or activities of a particular historic figure, group, organization, or institution that has made a significant contribution to, or impact on, the community, province or nation?
  c) Is the site associated with a particular historic event whether cultural, economic, military, religious, social or political that has made a significant contribution to, or impact on, the community, province or nation?
  d) Is the site associated with a traditional recurring event in the history of the community, province, or nation, such as an annual celebration?

- Public Significance
  a) Does the site have potential for public use in an interpretive, educational or recreational capacity?
     - visibility and accessibility to the public
     - ability of the site to be easily interpreted
     - opportunities for protection against vandalism
     - economic and engineering feasibility of reconstruction, restoration and maintenance
     - representativeness and uniqueness of the site
     - proximity to established recreation areas
     - compatibility with surrounding zoning regulations or land use
     - land ownership and administration
     - local community attitude toward site preservation, development or destruction
     - present use of site
  b) Does the site receive visitation or use by tourists, local residents or school groups?

- Other

- Is the site a commonly acknowledged landmark?
- Does, or could, the site contribute to a sense of continuity or identity either alone or in conjunction with similar sites in the vicinity?
- Is the site a good typical example of an early structure or device commonly used for a specific purpose throughout an area or period of time?
- Is the site representative of a particular architectural style or pattern?

6.4 Impact Methodology

For each predicted impact, criteria are described. These criteria include the **magnitude** (size or degree scale), which also includes the **type** of impact, being either a positive or negative impact; the **duration** (temporal scale); and the **extent** (spatial scale), as well as the **probability** (likelihood). The methodology is quantitative and generated through a spreadsheet but requires professional judgement in the application of the criteria.
When assessing impacts, broader considerations are also considered, these include the **confidence** with which the assessment was undertaken, the **reversibility** of the impact and the resource **irreplaceability**.

Calculations
(as applied in the excel spreadsheet 'Erf 705 Ferndale'.xls')

For each predicted impact, certain criteria are applied to establish the likely **significance** of the impact, firstly in the case of no mitigation being applied and then with the most effective mitigation measure(s) in place.

These criteria include the **magnitude** *(*size or degree scale), which also includes the **type** of impact, being either a positive or negative impact; the **duration** (temporal scale); and the **extent** (spatial scale). These numerical ratings are used in an equation whereby the **consequence** of the impact can be calculated. Consequence is calculated as follows:

Consequence = type x (magnitude + duration + extent).

To calculate the significance of an impact, the **probability** (or likelihood) of that impact occurring is applied to the consequence.

Significance = consequence x probability

Depending on the numerical result, the impact would fall into a significance category as negligible, minor, moderate or major, and the type would be either positive or negative.

The following tables show the scales used to classify the above variables and define each of the rating categories.

6.4.1 Magnitude

The magnitude refers to the degree of alteration of the affected environmental receptor. The relevant descriptor for magnitude is selected by the user (refer to Table).

Table 6. Description of magnitude and assigned numerical values

Numerical Rating	Magnitude	
	Category	**Descriptors**
1	**Negligible**	Natural and/ or social functions and/ or processes are negligibly altered
2	**Very low**	Natural and/ or social functions and/ or processes are slightly altered
3	**Low**	Natural and/ or social functions and/ or processes are somewhat altered
4	**Moderate**	Natural and/ or social functions and/ or processes are moderately altered

5	**High**	Natural and/ or social functions and/ or processes are notably altered
6	**Very high**	Natural and/ or social functions and/ or processes are majorly altered
7	**Extremely high**	Natural and/ or social functions and/ or processes are severely altered

*NOTE: Where applicable, the magnitude of the impact is related to a relevant standard or threshold or is based on specialist knowledge and understanding of that particular field.

6.4.2 Duration

The duration refers to the length of permanence of the impact on the environmental receptor. The relevant descriptor for duration is selected by the user (refer to Table).

Table 7. Description of duration and assigned numerical values

Numerical Rating	Duration	
	Category	**Descriptors**
1	**Immediate**	Impact will self-remedy immediately
2	**Brief**	Impact will not last longer than 1 year
3	**Short term**	Impact will last between 1 and 5 years
4	**Medium term**	Impact will last between 5 and 10 years
5	**Long term**	Impact will last between 10 and 15 years
6	**On-going**	Impact will last between 15 and 20 years
7	**Permanent**	Impact may be permanent, or in excess of 20 years

6.4.3 Extent

The extent refers to the geographical scale of impact on the environmental receptor. The relevant descriptor for extent is selected by the user (refer to Table).

Table 8. Description of extent and assigned numerical values

Numerical Rating	Extent	
	Category	Descriptors
1	**Very limited**	Impacts very limited / felt in isolated areas of the study area
2	**Limited**	Impacts limited to specific parts of the study area
3	**Local**	Impacts felt mostly throughout the study area
4	**Municipal area**	Impacts felt outside the study area, at a municipal level
5	**Regional**	Impacts felt outside the study area, at a regional / provincial level
6	**National**	Impacts felt outside the study area, at a national level
7	**International**	Impacts felt outside the study area, at an international level

6.4.4 Probability

To calculate the significance of an impact, the probability (or likelihood) of that impact occurring is also taken into account. (Refer to Table).

Table 9. Definition of probability ratings

Numerical Rating	Probability	
	Category	**Descriptors**
1	**Highly unlikely / None**	Expected never to happen
2	**Rare / improbable**	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
3	**Unlikely**	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
4	**Probable**	Has occurred here or elsewhere and could therefore occur
5	**Likely**	The impact may occur
6	**Almost certain / Highly probable**	It is most likely that the impact will occur
7	**Certain / Definite**	There are sound scientific reasons to expect that the impact will definitely occur

6.4.5 Significance

These are auto calculated in the spreadsheet as described above and includes the following categories in Table 10. This table is for illustration only.

Table 10. Application of significance ratings

Range		Significance rating
-147	-109	Major (-)
-108	-73	Moderate (-)
-72	-36	Minor (-)
-35	-1	Negligible (-)
0	0	Neutral
1	35	Negligible (+)
36	72	Minor (+)
73	108	Moderate (+)
109	147	Major (+)

6.4.6 Further Considerations

The following, broader considerations will also be considered. These include the level of confidence in the assessment rating; the reversibility of the impact; and the irreplaceability of the resource as set out in Tables 11, 12 and 13 respectively.

Table 11. Definition of confidence ratings

Rating	Descriptor
Low	Judgement is based on intuition

Medium	Determination is based on common sense and general knowledge
High	Substantive supportive data exists to verify the assessment

Table 12. Definition of reversibility ratings

Rating	Descriptor
Low	The affected environment will not be able to recover from the impact - permanently modified
Medium	The affected environment will only recover from the impact with significant intervention
High	The affected environmental will be able to recover from the impact

Table 13. Definition of irreplaceability ratings

Rating	Descriptor
Low	The resource is not damaged irreparably or is not scarce
Medium	The resource is damaged irreparably but is represented elsewhere
High	The resource is irreparably damaged and is not represented elsewhere

7. Impact Assessment and Proposed Mitigation

The site was readily accessible, and the confidence level of the provided impact evaluation is as a result high.

7.1 Damage to Historical Built Environment

Table 14. Damage to Historical Built Environment

Ref:	2			
Project phase	**Construction**			
Impact	**Damage to Built Environment**			
Description of impact	**Demolision of the current structures will result in a complete loss of the heritage component.**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**It is recommended that the photographic documentation contained in the HIA report is sufficient to warrant the issuing of a permit for destruction from the Built Environment Committee of G-PHRA and no further work is deemed necessary.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Brief	Impact will not last longer than 1 year	Brief	Impact will not last longer than 1 year
Extent	Very limited	Impacts very limited / felt in isolated areas of the study area	Very limited	Impacts very limited / felt in isolated areas of the study area
Magnitude	Very low	Natural and/ or social functions and/ or processes are slightly altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	Low	The affected environment will not be able to recover from the impact - permanently modified
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Negligible - negative**		**Negligible - negative**	
Comment on significance	A permit for the destruction of these structures will need to be obtained from G-PHRA			
Cumulative impacts	Combined with the renewal of many of the older townships in the Ekurhuleni area there is a compounded effect in regards to the loss of the architectural history of the area.			

7.2 Excavation of Palaeontological Materials

Table 15. Excavation of Palaeontological Materials

Ref:	3			
Project phase	**Construction**			
Impact	**Excavation of Palaeontological Materials**			
Description of impact	**If excavations are to intrude deeper than 10m (the upper ceiling of these deposits) it could unearth fossiliferous materials.**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**A chance finds protocol for fossils should be included in the ESMP.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Positive	
Duration	Short term	impact will last between 1 and 5 years	Short term	impact will last between 1 and 5 years
Extent	Limited	Impacts limited to specific parts of the study area	Limited	Impacts limited to specific parts of the study area
Magnitude	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere	Highly unlikely / none	Expected never to happen
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Negligible - negative**		**Negligible - positive**	
Comment on significance	Due to the limited research on palaeontology in this area, the recovery of fossils will actually be beneficial to science if the recovery is done correctly.			
Cumulative impacts	Compounded impacts due to the renewal of the Ekurhuleni area.			

7.3 Damage to Unidentified or Buried Archaeological Sites

Table 16. Damage to Unidentified or Buried Archaeological Sites

Ref:	4			
Project phase	**Construction**			
Impact	**Unidentified/Sub-surface Archaeological Remains**			
Description of impact	**Archaeological deposits not identified during the fieldwork or which are buried under current development horizon.**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**Adherence to the Chance Finds Protocol contained in this report.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Positive	
Duration	Short term	impact will last between 1 and 5 years	Long term	Impact will last between 10 and 15 years
Extent	Local	Impacts felt mostly throughout the study area	Regional	Impacts felt outside the study area, at a regional / provincial level
Magnitude	High	Natural and/ or social functions and/ or processes are notably altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur	Likely	The impact may occur
Confidence	Medium	Determination is based on common sense and general knowledge	High	Substantive supportive data exists to verify the assessment
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Negligible - negative**		**Minor - positive**	
Comment on significance	Although information on archaeological sites are scant, there is a possibility of encountering Stone Age and Iron Age sites subteraneanly.			
Cumulative impacts	The growth of the housing development industry in this area could negatively affect stone walled sites (if they occur - none were identified during fieldwork) and the impact of construction activities could compound this effect.			

7.4 Damage to Unmarked Graves or Burials

Table 17. Damage to Unmarked Graves

Ref:	1			
Project phase	**Construction**			
Impact	**Damage to Grave and Burial Sites**			
Description of impact	**Construction activities could possibly damage unmarked burial and grave sites.**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**Adherence to the Chance Finds Protocol contained in this report.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Brief	Impact will not last longer than 1 year	Brief	Impact will not last longer than 1 year
Extent	Limited	Impacts limited to specific parts of the study area	Limited	Impacts limited to specific parts of the study area
Magnitude	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Highly unlikely / none	Expected never to happen	Highly unlikely / none	Expected never to happen
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	High	The resource is irreparably damaged and is not represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Negligible - negative**		**Negligible - negative**	
Comment on significance	Graves can be seen as extremely sensitive heritage objects and should be treated as such. Although there were no indications of burials or graves, the long history of occupation in the area always warrants attention to their possible occurance.			
Cumulative impacts	Compounded impacts due to the renewal of the Ekurhuleni area.			

8. Conclusions and Recommendations

The study area located on Portion 1 and Remainder of Erf 705 in Ferndale was investigated through archival studies. The area can be described as an urban environment with office blocks, shops, businesses and residential homes and complexes.

Even though the buildings on site are older than 60 years, these are in a dilapidated state and poses a risk to inhabitants due to its unsound condition. It was found that these structures have been subject to severe alterations throughout their life and do not currently reflect the architectural style or character of the buildings and area of the turn of the century.

It is the opinion of the investigators that the photographic documentation contained in this HIA report is comprehensive enough to detail the characteristics of the buildings. A second phase of investigation is therefore not deemed necessary based on the condition of the structures. It is recommended that the findings of the HIA be deemed sufficient to apply for a Demolition Permit from SAHRA and the PHRA-G's Built Environment Committee after obtaining comments from SAHRA.

The building on Erf 703 will not be part of the demolition application.

9. Chance Finds Protocol

It is important to note that, although unlikely, sub-surface remains of heritage sites could still be encountered during construction of the project. Such sites would offer no surface indication of their presence due to the high state of alterations in some areas as well as heavy vegetation cover in other areas. The following indicators of unmarked sub-surface sites could be encountered:

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate);
- Bone concentrations, either animal or human;
- Ceramic fragments such as pottery shards either historic or pre-contact;
- Stone concentrations of any formal nature.

The following recommendations are given should any sub-surface remains of heritage sites be identified as indicated above:

- All operators of excavation equipment should be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures should they be encountered.
- All construction in the immediate vicinity (50m radius of the site) should cease.
- The heritage practitioner should be informed as soon as possible.
- Mitigation measures (such as refilling etc.) should not be attempted.
- The area in a 50m radius of the find should be cordoned off with hazard tape.
- Public access should be limited.
- The area should be placed under guard.
- No media statements should be released until such time as the heritage practitioner has had enough time to analyze the finds.

Should any archaeological, palaeontological or cultural heritage resources, including graves or human remains (as defined and protected by the NRA 1999) be identified during the vegetation cleaning, surface scraping, trenching, excavation or construction phases of the development, it is recommended that the process as described below is followed.

On-site Reporting Process:

- The identifier should immediately notify his / her supervisor of the find(s).
- The identifier's supervisor should report the incident to the on-site SHE / SHEQ officer within 24hours of the find(s).
- Should the find(s) relate to human remains, the on-site SHE / SHEQ officer should immediately notify the nearest SAPS station of the find(s).
- The on-site SHE / SHEQ officer should report the find(s) to the appointed ECO / ELO officer within 24 hours after the find(s) was / were reported by the relevant supervisor.
- Within 72 hours of the find(s) being reported to the SHE / SHEQ officer, the ECO / ELO officer should ensure that the find(s) is reported on the SAHRIS Database and the relevant heritage specialist is contacted to make arrangements for a heritage inspection.
- Should the find(s) relate to human remains, the ECO/ ELO officer should ensure that the heritage inspection coincides with the SAPS inspection, to verify if the find(s) is / are of forensic, authentic (informal / older than 60 years) or archaeological (older than 100 years) origin.
- The heritage specialist should compile a heritage site inspection report based on the site-specific findings. The report should make recommendations for the destruction, conservation or mitigation of the find(s) and prescribe a recommended way forward for the development. The report should be submitted to the ECO / ELO officer, who should ensure submission thereof on the SAHRIS database.
- SAHRA / the relevant PHRA will state legal requirements for the development to proceed in the SAHRA / PHRA comments on the heritage inspection report.
- The developer should proceed with implementation of the SAHRA / PHRA comment requirements, which may well stipulate permit specifications to proceed.
    - Should the permit specifications stipulate further Phase 2 archaeological investigations (including grave mitigation), a suitable accredited heritage specialist should be appointed to conduct the work according to the applicable SAHRA / PHRA process.

- The heritage specialist should apply for the permit.
- Upon issue of the SAHRA / PHRA permit, the Phase 2 heritage mitigation program may commence.
- Should the permit specifications stipulate destruction of the find(s) under a SAHRA / PHRA permit, the developer should immediately proceed with the permit application.
- Upon the issue of the SAHRA / PHRA permit, the developer may legally proceed with the destruction of the archaeological, palaeontological or cultural heritage resource(s).
- Upon completion of the Phase 2 heritage mitigation program, the heritage specialist will submit a Phase 2 report to the ECO / ELO officer, who should in turn ensure the submission thereof on the SAHRIS database.
- Report recommendations may include that the remainder of a heritage site be destroyed under a SAHRA / PHRA permit.
- Should the find(s) relate to human remains of forensic origin, the matter will be directly addressed by SAPS. A SAHRA / PHRA permit will not be applicable.

NOTE: the SAHRA / PHRA permit and process requirements relating to the mitigation of human remains requires suitable advertising of the find(s), consultation, mitigation and re-internment / deposition process.

Duties of the Supervisor:

1. The supervisor should ensure that all activities in the vicinity of the find(s) are ceased immediately upon the reporting thereof by the identifier.
2. The supervisor should ensure that the location of the find(s) is secured within 24 hours of the reporting thereof by means of a temporary fence allowing for a 5 – 10m heritage conservation buffer zone around the find(s). The temporary conserved area should be sign-posted as a "No Entry – Heritage Site" zone.
3. Where development was impacted on the resource, no attempt should be made to remove artefacts / objects / remains further from their context and should any artefacts / objects / remains that has / have been removed should be collected and placed within the conservation area or kept for safekeeping with the SHE / SHEQ officer.
4. It is imperative that where development has impacted on any archaeological, palaeontological or cultural heritage resources, the context of the find(s) be preserved as much as possible for interpretive and sample testing purposes.
5. The supervisor should record the name, company and capacity of the identifier and compile a brief report describing the events surrounding the find(s).
6. The report should be submitted to the SHE / SHEQ officer at the time of the incident report.

Duties of the SHE / SHEQ officer:

1. The SHE / SHEQ officer should ensure that the location of the find(s) is recorded with a GPS. A photographic record of the find(s), including implementation of temporary conservation measures, should be compiled. Where relevant a scale bar, or object that can indicate the scale, should be inserted in the photographs for interpretive purposes.
2. The SHE / SHEQ officer should ensure that the supervisor's report, GPS co-ordinate and photographic record of the find(s) are submitted to the ECO / ELO officer.
3. Should the find(s) relate to human remains, the SHE / SHEQ officer should ensure that the mentioned reporting be made available to the SAPS at the time of the incident report.
4. Any retrieved artefacts / objects / remains should, in consultation with the ECO / ELO officer, be kept in a safe place (preferable on site).

Duties of the ECO / ELO officer:

1. The ECO / ELO officer should ensure that the incident is reported on the SAHRIS Database. (The ECO / ELO officer should ensure that he / she is registered on the relevant SAHRIS case with SAHRIS authorship to the case at the time of appointment to enable heritage reporting.)
2. The ECO / ELO officer should ensure that the incident report is forwarded to the heritage specialist for interpretive purposes at his / her soonest opportunity and prior to the heritage site inspection.
3. The ECO / ELO officer should facilitate appointment of the heritage specialist by the developer / construction consultant for the heritage inspection.
4. The ECO / ELO officer should facilitate access by the heritage specialist to any retrieved artefacts / objects / remains that have been kept in safekeeping.

5. Should the find(s) relate to human remains, the SHE / SHEQ officer should facilitate coordination of the heritage site inspection and the SAPS site inspection.
6. The ECO / ELO officer should facilitate heritage reporting and heritage compliance requirements by SAHRA / the relevant PHRA, between the developer / construction consultant, the heritage specialist, the SHE / SHEQ officer (where relevant) and the SAPS (where relevant).

Duties of the Developer / Construction Consultant:

1. The developer / construction consultant should ensure that an adequate heritage contingency budget is accommodated within the project budget to facilitate and streamline the heritage compliance process in the event of identification of incidental archaeological, palaeontological and / or cultural heritage resources during the course of the vegetation cleaning, surface scraping, trenching, excavation or construction phases of the development, when resources not visible at the time of the surface assessment may be exposed.

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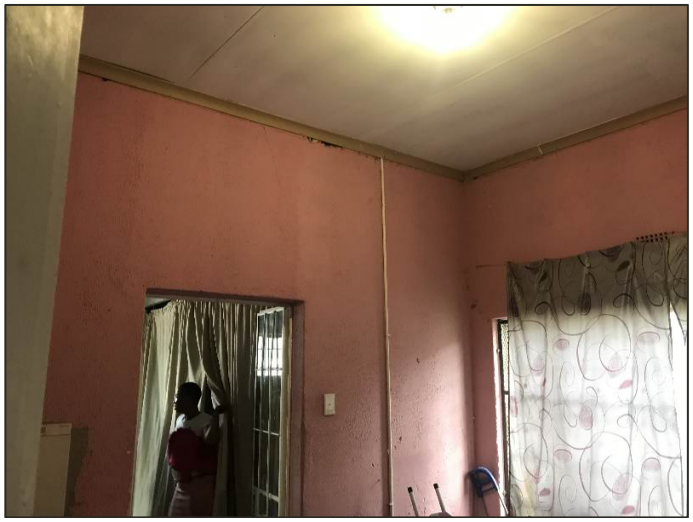
11. Addendum 1

11.1 Portion 1 of Erf 705




memories


memories

11.2 Remainder of Erf 705