A HERITAGE IMPACT ASSESSMENT STUDY FOR THE PROPOSED PRASA'S MODERN MAINTENANCE DEPORTS UPGRADE, SPRINGFIELD DEPOT, CITY OF ETHEKWINI METROPOLITAN MUNICIPALITY, KWAZULU-NATAL PROVINCE

PROJECTS & HERITAGE CONSULTANTS (PTY)LTD

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ACKNOWLEDGEMENT OF RECEIPT

CLIENT:	Ecosolve Consulting (Pty) Ltd
CONTACT PERSON:	Mr. Tsepo Lepono Tel: + 27 11 022 1364 Fax: +27 86 697 7422 Cell: +27 83 339 9103 E-mail: tsepo@ecosolve.co.za
CONSULTANT:	NGT Projects & Heritage Consultants
Heritage Specialist:	Nkosinathi Tomose Cell: +27 78 163 0657 E-mail: nkosinathi@ngtgroup.co.za
SIGNATURE:	NGT__Nkosinathi Tomose for NGT____

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DECLARATION OF INDEPENDENCE

This report has been compiled by Nkosinathi Tomose, leading archaeologist and heritage consultant for NGT Project and Heritage Consultants. The views expressed in this report are entirely those of the author and no other interest was displayed during the decision making process for the project.

HERITAGE CONSULTANT: NGT Projects & Heritage Consultants (Pty) Ltd

CONTACT PERSON: Nkosinathi Tomose

SIGNATURE: NGT__Nkosinathi Tomose for NGT_

EXECUTIVE SUMMARY

NGT Projects and Heritage Consultants (Pty) Ltd was been contracted by Ecosolve Consulting (Pty) Ltd to conduct an Heritage Impact Assessment(HIA) (exclusive of Palaeontological desktop study) for the proposed PRASA's modern maintenance deports upgrade, Springfield Depot (Ethekwini Metropolitan Municipality) as part of specialists inputs impact assessment studies required to fulfil the BA process. Nkosinathi Tomose, the lead archaeologist and heritage consultant of NGT Projects and Heritage Consultants, conducted the HIA study for the proposed PRASA's modern maintenance deports upgrade, Springfield Depot, Ethekwini Municipality, KwaZulu-Natal Province, South Africa. The HIA, therefore, only assesses the range of all the manmade or human influenced/altered resources within the Springfield Flats PRASA depot, and immediate outside but within the proposed BA project area as marked in Figure 1 and 2. There was no Palaeontological desktop study carried out as part of this HIA study because of the nature and scope of the proposed development, but also because the proposed development does not occur within an area known for dolomitic formation.

The field work conducted on the 31st May 2013 yielded 9 sites complexes all which are recent (under 60 years old) industrial built environment and landscape features. The indentified structures are 58 years old - a date arrived at through assessment of 1950s maps of the study area and based on the history and development of Springfield depot. All the identified features do not qualified to be referred to as historic structures nor do they meet the minimum requirements for the general protection of built environment and landscape features in terms of Section 34 of the NHRA, No. 25 of 1999; KZNHA, No.10 of 1997 (Section 26 (1)); and KZNHB, 2008 (Chapter 8 and section 29 (1)). The identified features included:

Existing boardroom and lounge (SPF-1), shunters/drivers office and rest room (SPF-2), female ablution and changing rooms (SPF-3), shunters/coach operations control cabin (SPF-4), coach repairs (& loading bay) and parking (SPF-5), pump house (SPF-6), turntable (SPF-7), substation (SPF-8) and running shed and associated structures (like offices, store shed and flammable store, security check point etc).

Based on the fact that the identified built environment and landscape features are not heritage resources in terms of the prescribed heritage policies and/or legislations and existing literature about the project area, observations made during the physical survey of the proposed development area, assessment and evaluation methods using SAHRA minimum standards for evaluation and grading of archaeological and other heritage resource - the following

conclusions and recommendations are made about the proposed Springfield Flats PRASA's depot modern maintenance deports upgrade:

- It is conclude that in terms of heritage resources management there are no objections to the project.
- There are no negative perceptions about the it impact of the proposed infrastructure on the identified built environment and landscape features which are all below the prescribed 60 year old benchmark for the general protection of built environment
- It is also recommended that Amafa' KwaZulu-Natali approve the project in terms of cultural resources management since there were no heritage resources found within and immediately outside the project area.

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ABBREVIATIONS

Acronyms	Description
AIA	Archaeological Impact Assessment
AMAFA	Amafa KwaZulu-Natali
ASAPA	Association of South African Professional Archaeologists
BA	Basic Assessment
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
DoE	Department of Energy
EIA practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Early Stone Age
GIS	Geographic Information System
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
KZNHA	KwaZulu-Natal Heritage Act
KZNHB	KwaZulu-Natal Heritage Bill
K.y.a	Thousand years ago
LSA	Late Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
MIA	Middle Iron Age
NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act
NEMA	National Environmental Management Act
PHRA	Provincial Heritage Resources Agency
PSSA	Palaeontological Society of South Africa
ROD	Record of Decision
PRASA	Passenger Rail South Africa
PDAFP	Proposed Development Area Footprint
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency
SPV	Special Purpose Vehicle

TERMS AND DEFINITIONS

Archaeological resources

This includes:

- material remains resulting from human activities which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;
- rock art, being any 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 which is older than 100 years, including any area within 10m of such representation;
- wrecks, being any vessel or aircraft, or any part thereof which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;
- features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

Cultural significance

This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance

Development

This means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in the change to the nature, appearance or physical nature of a place or influence its stability and future well-being, including:

- construction, alteration, demolition, removal or change in use of a place or a structure at a place;
- carrying out any works on or over or under a place;

- subdivision or consolidation of land comprising a place, including the structures or airspace of a place;
- constructing or putting up for display signs or boards;
- any change to the natural or existing condition or topography of land; and
- any removal or destruction of trees, or removal of vegetation or topsoil

Heritage resources

This means any place or object of cultural significance

1. INTRODUCTION

1.1. Project Background

This project is one of the proposed PRASA's deports upgrade and maintenance projects. The Springfield rolling stock (upgrade and maintenance) depot is an existing PRASA facility in the KwaZulu-Natal northern region. Located within City of Ethekwini Local Municipality- the erven making up the site is owned by PRASA and zoned for transport use (Figure 1). The site covers approximately 17 hectare and a length of 1240 meters. Springfield was identified as the most suitable existing maintenance depot in KwaZulu-Natal for PRASA maintenance operations and to receive new rolling stock by 2015. The selection was made during the site selection process which took place in March 2012 (Arcus GIBB (Pty) Ltd, 2012). It is proposed that over a period of 20 years, new rolling stock will be introduced whilst the existing stock will be phased out. During this phasing period, both existing and new rolling stock will be maintained at the Springfield Depot - a process which will also involve construction or upgrade of maintenance depots. Because of the size of the depot, not staging will take place on the site - these (staging & lifting) will take place in Durban Yard located approximately 8,5km from the site. the site currently accommodates the following infrastructure:

- The following maintenance activities are done:
    - Running maintenance and inspection of the existing 5M/10M rolling stock fleets
    - Maintenance staging of out-of-service coaches
    - Component repairs
    - Component storage
    - Turning around of single coaches (vehicle turntable)

- The Springfield rolling stock maintenance depot has the following operational access:
    - Single ended access on the eastern side from the main line, close to Umgeni station.

- Double track access from the eastern side
- Western end of Springfield depot is a dead end.

All train operations are manually controlled and turnout sets are operated by hand tumblers.

This HIA study forms part of specialists' studies inputs into the BA process. The study aims to advise on some of the best suitable heritage mitigation measures for heritage resources in terms of known heritage resources management measures.

1.1.1. Proposed Project Aims

"PRASA intends to modernise and upgrade their current services and their key objective is to promote rail as the preferred mode of transport for the majority of South Africans. [it is suggested by PRASA- 2011] that... 'this will only [be achieved or] become reality through adequate investment in the existing neglected system'. The poor conditions of the unreliable, aging rolling stock is the "single largest obstacle" for PRASA to achieve their planned objective. Combined with the broader strategy to acquire modern technology and a changing passenger demand, PRASA is focused on upgrading and investing in new rolling stock over the next 20 years" (Arcus GIBB, 2012). All the current existing metro trains will be phased out within the 20 year period. The newly proposed technology and improved maintenance practices envisaged for the new fleet will require newly refurbished maintenance depots. Other than infrastructure improvement - the overarching objective is to modernise and make relevant to metro passenger trains to existing and potential clientele/passengers - making the rail industry in the country more user friendly and preferred mode of transport. The current survey area was selected as the best suitable place for the proposed project out of a number of other proposed alternatives - eleven sites were selected during the feasibility or screening phase (Arcus GIBB, 2012). Therefore, the aim of the current study is to advise PRASA on the suitable and sustainable measures to use during the construction and operational phases of the project and its closure in terms of management of the natural and cultural environment. This is done through a compilation of various impact assessment studies that will feed into the current BA process and ultimately the Environmental Management Plan (EMP) document following the completion of the BA. This HIA study will contribute to the development of such documents through assessing and evaluating impacts that affect or have the potential to impact on the cultural environment. The general proposed infrastructure upgrade for this project throughout the country will predominantly involve the follow upgrades:

- Upgrade/Modification of the existing maintenance depots;
- New maintenance infrastructure which will include;
- Approximately 6 or 7 full length roads per depot for routine exams and repairs
- Component exchange roads, 2 full length roads per depot;
- Drop pits, under floor lift, or synchronised jacks for rapid bogie exchange;
- Specialised lifting equipment as required for trains;
- Shore supply (external power supply for trains auxiliaries);
- Roof access platforms;
- An automatic train washing plant, and facilities for pressurised cleaning of under frame equipment;
- An under floor wheel lathe;
- Paint booth;
- Adequate undercover storage for both small and large components;
- Fork lift trucks;
- New Storage Yards; and
- Upgrade/Modification of existing Storage Yards

At Springfield Flats PRASA Depot the proposed Depo Structure upgrade will include the following:

- ¾ Running shed:
    - o Construction of an additional pit lane adjacent to the existing pit lanes
    - o Construction of a forklift truck access road adjacent to the existing pit lanes
    - o Extending the roof height to improve clearance for working on train roofs
    - o Refurbishment of all other work spaces within the running shed
    - o Phased implementation of work to ensure continued maintenance of rolling stock during construction
    - o Lifting shop - Construction of a complete and modern lifting shop
- ¾ Wheel lathe - Construction of a new wheel profiling facility
- ¾ Component workshops - Construction of a new component maintenance workshop and related work areas

- ¾ Stores - Construction of a new storage facilities
- ¾ Train cleaning - Construction of a new intensive new intensive cleaning, facility
- ¾ Depot staff facilities - Construction of new depot staff facilities
- ¾ Administration buildings - Refurbishment of administration facilities
- ¾ Train operations staff - Construction of a new train operating staff facility
- ¾ Train operations - Construction of a local train control facility

And the Rail Infrastructure will include:

The upgrade of the Springfield depot railway infrastructure provides an opportunity to improve the site layout, modernise technology, and improve operational functionality and integration with the mainline operations. The upgrade of the Springfield depot railway infrastructure will include:

- ¾ Running shed maintenance staging lines
- ¾ Lifting shop maintenance staging lines
- ¾ Wheel lathe line
- ¾ Turn table line
- ¾ Intensive cleaning facility line
- ¾ All rail infrastructure will be automated and signalled
- ¾ New rail electrical infrastructure will be installed

The above infrastructure is proposed because PRASA wants to design and construct a fully functional depot that:

- Will be able to service PRASA's new metro trains by the time that the new train sets are delivered in April 2015 and will cater for the increased new fleet maintenance demand required by the full fleet deployment up until 2034.
- Will be able to service PRASA's existing metro trains up until the new trains full fleet deployment is completed in 2034.

1.1.2. Terms of Reference for the Appointment of Archaeologist and Heritage Specialist

Because of the nature and size of the proposed development - upgrade and maintenance of Springfield Flats PRASA depot and associated infrastructure exceeding a total area of 5000m^2 on an area covering approximately 17 hectares a need to conduct a BA developed. In terms of the EIA Regulations of June 2010 (Government Notice 543-546 published in terms of the NEMA, No 107 of 1998) the construction of the proposed facilities is listed as an activity that requires environmental authorisation. This is because the project comprises development of structures and bulk infrastructure such as roads, water supply and electrification – a development that occupies an area of less than 20ha. Undertaking an a BA instead of full EIA process is therefore a requirement. The current process comprises of a BA and it involves the identification and assessment of environmental impacts through specialist studies.

Ecosolve Consulting (Pty) Ltd was appointed by PRASA (Ltd) as a lead Environmental Impact Practitioner to manage the BA process and associated impact studies for the proposed development project. Ecosolve Consulting appointment of NGT Projects & Heritage Consultants (Pty) Ltd as an independent and lead CRM firm to conduct an HIA (exclusive of Palaeontological desktop study) for the proposed development as part of specialists (inputs) impact assessment studies required to fulfil the BA process and its requirements. Nkosinathi Tomose, the lead archaeologist & heritage consultant for NGT Projects & Heritage Consultants, conducted the HIA study for the proposed Springfield Flats PRASA depot Ethekwini Municipality, KwaZulu-Natal Province, South Africa (Figures 1-2).

The appointment of NGT Projects & Heritage Consultants (as an independent CRM firm) is in terms of the KZNHA, No. 10 of 1997 (at a provincial level), NHRA, No. 25 of 1999 (as amended), the NEMA, No.107 of 1998 (as amended & the applicable 2010 Regulations), as well as other applicable legislations and bills such as the KZNHB of 21 February 2008.

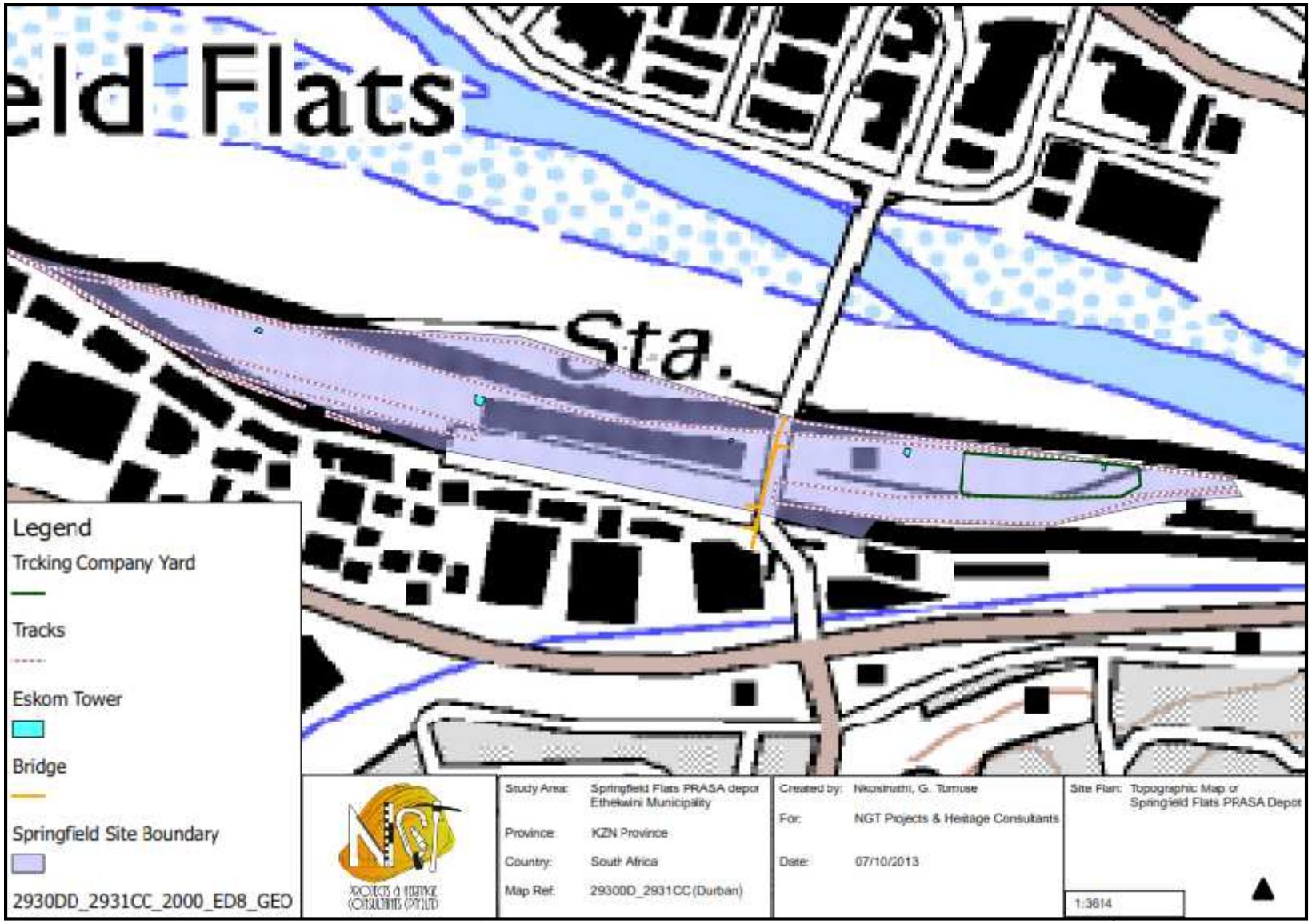


Figure 1 - General location of Springfield Flats PRASA Depot


Umgeni Business Park
Electron Rd
Umgeni Rd
M19
Ribes Pl
Foxglove Pl
Lotus Rd
Adine Rd
Rockvale
Google earth
Imagery Date: 5/6/2013 29°48'43.38" S 30°59'53.95" E elev 43 ft eye alt 3221 ft

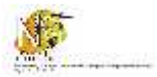


Figure 2- A 2013 Google Earth Map of Springfield Flats PRASA Depot showing the broader study area. Note the built environment and landscape feature (red boxes) and the existing railway tracks (within the black lines) and approximately 6 Eskom transmission towers.

2. BACKGROUND OF THE STUDY AREA

South Africa is rich in diverse forms and types of heritage, ranging from natural to cultural heritage. The natural heritage includes among other things: Geological, Palaeontological, and the various plant and animal species that define the country.

This HIA assesses the range of all the manmade or human influenced/altered resources within the Springfield Flats PRASA depot, and immediate outside but within the proposed BA project area as marked in figure 1 and 2.

2.1. Background Information Study: A Stone Age, Iron Age and Historical Archaeology (inclu. some Anthropological aspect) of the KwaZulu-Natal

The KwaZulu-Natal province provides archaeologists and cultural scientists alike with rich canvas of heritage resources varying from natural to manmade or human influenced or altered resources. The natural heritage resources of the area in which Springfield depot is located is highly degraded - the only remaining significant landmark feature is the Umngeni River (Figure1) passing the site north and joining the ocean in the Blue Lagoon (east). The man made environment of KwaZulu-Natal dates from prehistoric to historic times (time of written documents). Among archaeological (and heritage) time periods it includes: the ESA (Early Stone Age)– 2.6 m.y.a to 250 k.y.a.; MSA (Middles Stone Age)–250 k.y.a to about 35 k.y.a.; LSA (Late Stone Age)– 25 k.y.a to about 2000 k.y.a; 2 Iron Age periods (i.e. Early Iron Age & Late Iron Age)– 2000 k.y.a ; Colonial period and historic period1800s -1994 (and most recent). Other than archaeological resources, other heritage resources found within the KwaZulu-Natal region include: historical built environment and landscape features such as industrial sites, places of worships, monuments and memorials associated with events such as the two South African Wars (commonly referred as Anglo-Boer Wars), the regional wars such as the between

the various settlers (Anglo, Boer) and the Zulu's, Imfecane (African expansionist wars) and other uprisings like the Bambatha Rebellion.

The study area falls with a region known mostly for Iron Age, Historic and Industrial Archaeology. The study will therefore focus on the Iron Age, Historic and Industrial Period (inclusive of all historic built environment & landscape heritage), but without neglecting or excluding the different Stone Age periods or making reference to them (including Rock Art). This is deemed important because Stone Age is gave rise to the first occupation of KwaZulu-Natal and South Africa in general. Among other sites within the province that document the Stone Age archaeology is Sibudu Cave on the coast of KwaZulu-Natal. The cave contains evidence for early forms of cognitive human behavioural patterns in the Middle Stone Age of South Africa some 40 000 years BP (e.g. Wadley, 2005; Wadley et al, 2004; Wadley, 2001). There are also many other caves, valleys and hills of the KwaZulu-Natal that are known to have been occupied by the San people often referred to as San hunter-gathers or the Bushman. Evidence for this includes stone artefacts and an abundance of rock art, predominantly in the form of rock paintings in areas such as the Giants Castle Reserve (e.g. Main Cave) and Kamberg Nature Reserve in the Drakensberg Mountains (e.g. Vinnicombe, 1976). Rock art sites are also documented in Estcourt, Mooi River and Dundee (e.g. Lewis-Williams, 1992). These regions are located north-west of the study area, but do become relevant in defining the archaeological heritage of the province. Rock Art forms archaeology material culture which documents the last phase of the Stone Age Archaeology of the KwaZulu-Natal.

The second phase of occupation of KwaZulu-Natal is known as the Iron Age archaeology. The Iron Age of southern Africa dates to the first millennium AD. The site of Mzonjani, located some 15 km north of Durban is the oldest known Iron Age site in KwaZulu-Natal dating to the third millennium AD. By 1050 AD the Natal region is known to have been occupied by the Zulu people and this is the region in which Springfield is located (the former Natal) with what later became Zululand further north-east of the study area. This data is informed by historic accounts, oral traditions, linguistics, anthropological databases (including ethnographic records), and archaeological data as presented through material culture and artefacts. The defining archaeological traits of the Iron Age people in this region and other parts of southern Africa is represented through distinct ceramic traditions, stone walls and other structural

features such as grain bins and hut floor remains, kraals and often vitrified cattle dung (& often goat). Within southern Africa the KwaZulu-Natal region is known to have been occupied by the Nguni language speakers of the Eastern Bantu Language Stream. Iron Age structural features characterised this region include stone wall structures defined as the Central Cattle Pattern (C.C.P) (e.g. Huffman, 2007). The earliest known "stonewalling type" in this region is known as Moor Park and it dates from 14th to 16th Centuries AD (Figure 3). The site of Moor Park is located in the defensive position on the hilltops in the Midlands, from Bergville to Dundee just south of the town of Newcastle (see Huffman, 2010, 2007). Different theories or hypothesis have been argued for and against regarding the potential use of the site of Moor Park. Huffman (2007:33), for example argues that the wall served defensive purposes based on the location and setting of the walling - it is "located on the spurs and ends of hills, stone walls cut the settlement off from remaining terrain perimeter walls enclose about two thirds of the settlement, leaving the back free". However, it has to be noted that the C.C.P and other forms of Iron Age stonewalling features are not restricted and/or endemic to the eastern Bantu Language Speaking groups or the Nguni people whom the Zulu people form part of. Stone walling is found elsewhere in the country – in regions such as the Limpopo Province, North West Province and the Gauteng Province in South Africa and in other southern African countries such as Zimbabwe and Botswana etc. For example, Huffman argues that, "Iron Age stonewalling occurs over much of Southern Africa "and that "as the most visible sign of agro-pastoral settlement, there are several classifications, mostly for specific areas and few for larger regions" (Huffman 2007: 31). Later on the beehive structure became a dominant feature in the Zulu Nation material culture (Figure 4)

In terms of stonewalling, other known stonewall features in the former Natal region resulted during the times of war - for example, during the South African Wars, the prehistoric wars such as Mfecane, and Anglo-Zulu and Zulu and Boer wars.

The KwaZulu-Natal region is known to have been characterised by historical wars and battles. These wars and battles were within and between the different Zulu clans, Zulu's and other 'tribal groups' such as the Swati and Ndebele, the Zulu's and the Boers, the Zulu's and the British (e.g. Anglo-Zulu War), and the British and the Boers with participation from local Zulu's ,Indian and other groups (e.g. the South African War a.k.a the Anglo-Boer War). This gives a different layer to the history of the region.

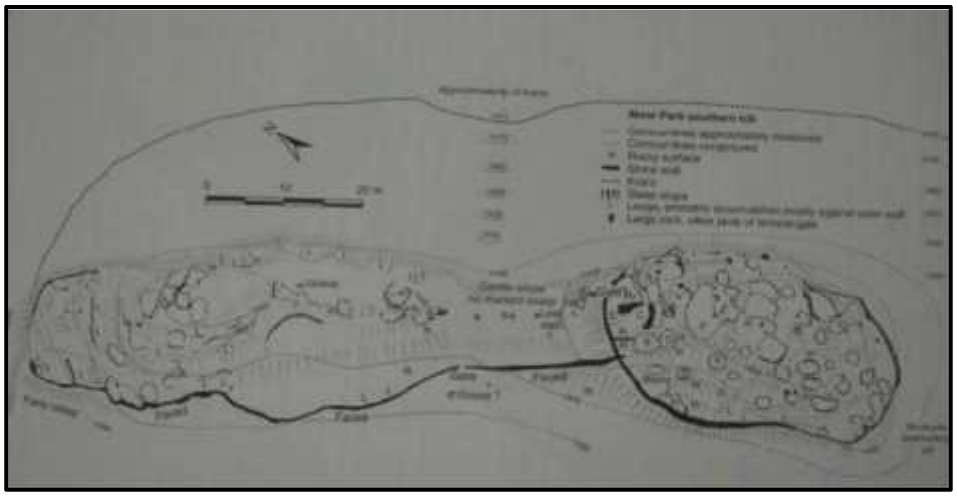


Figure 3- Site of Moor Park; picture taken from T, N. Huffman (2007) to illustrate the C.C.P stonewalling (see also Davies 1974 from which the picture was initial taken).

Figure 4-Pre-industrial Zulu village: beehive huts, note homestead built using thatch material (Colonial time picture) © Laband & Thompson, 2000

The third phase of occupation in current day KwaZulu-Natal was the Late Iron Age – a period just before the contact with the colonial settlers. In KwaZulu-Natal and other parts of southern Africa this period was characterised by a variety of expansionists' battles fought by different chiefdom, culminating to the pre-colonial southern African war called Imfecane (Ommer-

Cooper, 1993). In the province of KwaZulu-Natal it started during the early 1800's when the amaZulu were still under the 'kingdom' of Senzangakhona (Ommer-Cooper, 1993; Knight 1998). In KZN the Imfecane brought about many battles between and within the different local Zulu chiefdoms.

In other parts of the country the Imfecane also affected the Koni (Limpopo Province), the Tswana by the Ndebele ka-Mzilikazi (interior regions of the country) and the amaMpondo, amaHlubi, abaThembu and amaXhosa in the Eastern Cape regions (Wright, 1991). The Imfecane featured very prominent in KwaZulu-Natal during the reign of King Shaka KaSenzangakhona (Ommer-Cooper, 1993). Some of these battle and raids spread as far north to countries like Zimbabwe and Zambia. In Zululand, one of the bigger local chiefdoms that were conquered was the Ndwandwe chiefdom of Zwide kaLanga which were situated north of Shaka's territory around the modern day kwaNongoma (Knight, 1998).

Shaka managed, to some degree, to achieve his ideal kingdom by strategically expanding/extending the traditional amabutho system. The amabutho were the brigade of young men of similar age gathered together for a period of national service (Laband & Thompson, 2000; Torlage & Watt, 1999; Knight, 1998; Ommer-Cooper, 1993; Wright, 1991). The amabutho were quartered at large royal homestead, amakhanda (Figure 5)- which were sited strategically above the surrounding country to guard against both outside attack and internal dissension like the site of Moor Park discussed above. During the times of need, amabutho would be organised into impi to fight and protect the Zulu kingdom. The amabutho, organised into impi, would also be sent out to attack and take over rival chiefdoms that were opposed to King Shaka's rule and in the process incorporating them under his monarchy.

As powerful as it may have been, King Shaka's reign as the Zulu King did not last long as he was assassinated by his younger brothers in September 1828. One of them, Dingane KaSenzangakhona later became King. It is argued that by the time of his assassination he had not yet fully managed to assume and reconcile into his kingdom all the local Zulu chiefdoms: "much chiefdom within the kingdom were still unreconciled to Zulu rule, while Zulu influence south of Thukela (the Natal region) [was still]patchy" (Knight, 1998: 14). The area south of the Thukela River (Natal) was to some degree not in King Shaka's hold. He did not manage to assimilate all the chiefdoms south of uThukela under his rule and this had negative ramification to the Zulu kingdom for the years to come. King Shaka moved the royal homestead to KwaDukuza, Stanger, south of upper Thukela River before his assassination by Dingane (and

Mpande) who later re-relocated and rebuilt it at eMgungundlovu, 'The Place Surrounding the Elephant' in the Emakhazeni valley where King Shaka and King Dingane's forefathers are buried. The moving of the royal homestead by both Shaka and Dingane presents an interesting 'thesis' into the internal dynamics and politics of the Royal House and possibly one of the reasons for the assassination of King Shaka by his brothers. One important reason for the relocation of the royal homestead back to uMgungundlovu- north of the upper Thukela River was the growing influence of the white community at Port Natal (settlers) and the encroaching Trek Boers who crossed UKhahlamba Mountains into Natal in the 1837 (Knight, 1998). The period of encroachment of first Natal, then Zululand represents a fourth phase of settlement or occupation of KwaZulu-Natal. Before it became open to most people during the Union (1910-1961), Nationalist rule (1962-1994), and democratic South Africa (1994- current)

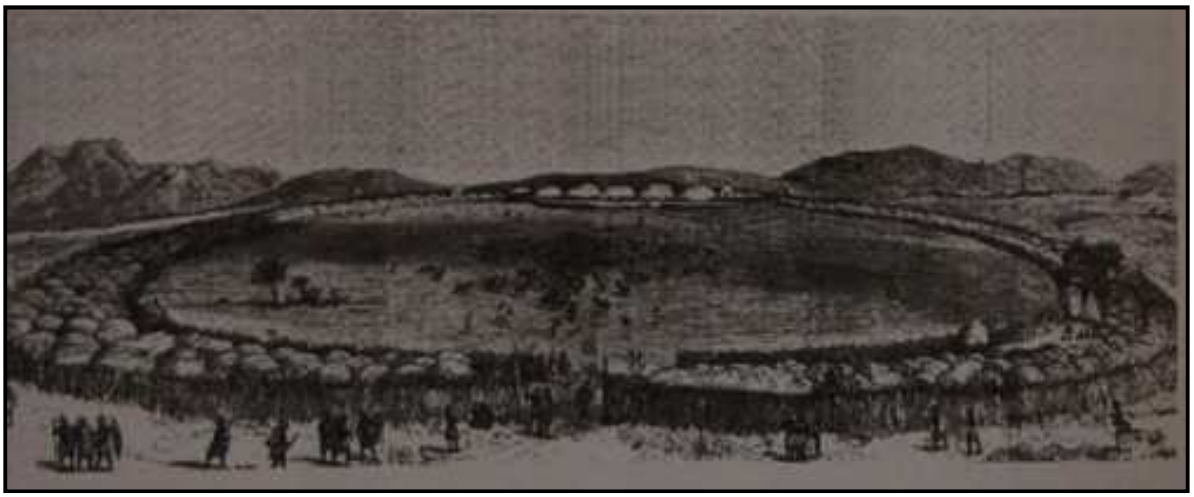


Figure 5 - An illustration of iKhanda or the royal homestead © Laband& Thompson, 2000

The fourth period of occupation of the KwaZulu-Natal came about with the settlement of KwaZulu-Natal by the colonial settlers. The settler and Boer influence south of upper Thukela (uThukela) River and the strong Zulu influence north of the river during the late 1830s become important in understanding the development of the two territories divided by the river that later became known as Natal and Zululand (Figure 6)

Since the 1830s the KwaZulu-Natal landscape was divided into north and the south; Natal in the south and Zululand in the north. Zululand can be broadly defined as the land between the uThukela River (some 100km north of present day Durban) and Swaziland and Mozambique to the north with Natal as the area south of the u-Thukela River. Initially this border was blurry and unmarked by any geographic or physical feature until the colonial times:

“Certainly, this was the extent of the Zulu kingdom during its most static phase, although at times the Zulu kings exercised authority over the country considerable further south, while their hold over the northern borders was always tenuous. In fact, the kings defined their boundaries in term of people who gave them allegiance, rather than by geographical features, and the idea of a single Zulu identity is largely mythical” (Knight, 1998:13)

Knight goes on to argue that “the history of the Zululand and its southern neighbour Natal has always been inextricably mixed, and the physical boundaries between them blurred”. The political border that existed between Zululand and Natal was in prehistoric times not marked by any geographic features. Natal came to existence when, “the south-eastern seaboard had remained unknown to the European world until Christmas Day 1497, when the Portuguese explorer, Vasco da Gama, had noted its existence in his log as he sailed around the Cape and up the east coast of Africa, searching for a route to the Indies. He christened it Terra Natalis, in honour of the birth of Christ, and for the centuries Natal was used to describe the country south of uThukela” (idem: 15). Existing archival evidence for the formal proclamation of uThukela River as the political boundary dividing Zululand (in the north) and Natal (in the South) dates to the 1850’s during King Cetshwayo ka Mpande rule as the Zulu King

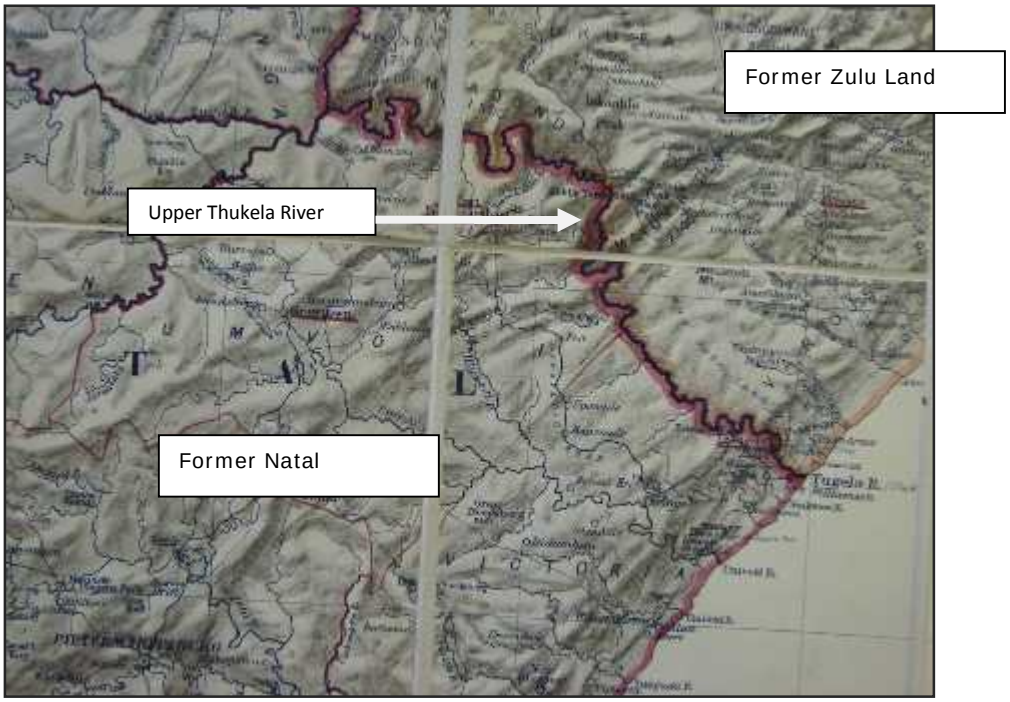


Figure 6- Map showing the Natal (south of Thukela River) and Zululand (north of Thukela River) Boundary. Stanford’s Large Scale Map of Zulu Land with adjoining parts of Natal,

Transvaal and Portuguese Africa, March 4th 1879 © Map Archives, Cullen Library, University of the Witwatersrand, Johannesburg, South Africa.

The above gives a brief overview of the archaeological and historical accounts of the KwaZulu-Natal. Our current study area (Springfield Flats PRASA depot) falls within the former Natal region of the present day KwaZulu-Natal Province. This historical overview becomes relevant to the current study because it informs the industrial archaeological component of the report which deals with the railway history and development and the associated built environment and landscape and infrastructure.

21.1. Industrial Archaeology: the South African Railway Industry and Implication for Springfield Flats PRASA Depot, Durban, KwaZulu-Natal Province

South African has long history of the railway industry compared to many countries located within the SADC block. It is in fact the mother country for the development of the railway industry in this socio-economic block. The first steam train in South Africa was development in Durban in the 2nd half of the 1800s - the train made its official journey between Durban and the Point on the 26 of June 1860 (Kemm,1997; Day, 1963). It covered a distance of only 3.2 km and it has been said that the journey only took approximately 5 minutes (Day, 1963). This development led to a wider development of the railway industry in the country. It took another two years before other trains were launched in the country. On the 13 February 1862 Cape Town and Eeste River launch their own trains. However, it has to be noted that the plans in the Cape of Good Hope to launch a railway industry in South Africa had long started before the first train launch in Durban in 1860. For example, "in 1828 the Cape Town Chamber of Commerce suggested to the Cape Colonial Government that a railway, or series of wooden ways, should be built on Cape Town wharf so that casks of wine and brandy could be rolled along them to the ships which would take them overseas" (Day, 1963: 11). This can be interpreted as the first strategic move to the development of the industry in the country. It took another 17 years, in 1845 to register a the first South African railway company - the Cape of Good Hope Western Railway (Ltd) with it Chairman Mr. Harrison Watson (Day, 1963). Mr. Watson was a banker and merchant by profession and he announced the same year (on the 17 October) that his company planned a railway and that "[The]Railway is calculated to be of immense benefit to this flourishing Colony; and as it is confined to the more populous districts in the neighbourhood of Cape Town, the enterprise is certain to return ample remunerative

profits to the shareholders" (ibid:13). However, the reaction to this announcement was rather negative. The promoters of this company had named the Attorney-General of the Cape Colony, the Honourable William Porter, as their legal adviser without properly consulting with him on the subject. Porter refused the invitation and was of the view the attempts were fatal and hopeless. Eventually the plans were put on hold. It took another 6 years since the launch of South Africa's first train in Durban, and 4 years for the Cape launch, for South Africa to significant strides in the development or expansion of the industry. The first expansion took place with the discovery of the diamonds in 1866. The railway lines developed from Cape Town to De Aar Junction and Kimberley. With the discovery of gold in the Witwatersrand in 1884 the railway infrastructure developed into the Transvaal. During this time other railway lines had developed from East London and Port Elizabeth in the modern day Eastern Cape Province. Back to KwaZulu-Natal, Day argues that ".... the little green engine fusing up and down three times a day between Durban and the Point had prepared the way for greater things" (Day, 1963:28). This is regardless of some of the challenges that it faces - at times it is suggested there was a reversion to ox-haulage whenever the engine was in for repairs. The line later expand from Durban and the Point to include a railway to Pietermaritzburg, then Capital of the Natal Colony. The first train in Natal seem to have been marred by constant abortive rides up to a point where external intervention was deemed necessary - Government in London wanted to intervene. This prompted the Natal Government to take the railway construction into its own hands. This suggests that the Natal Railway Company established in 1859 would have been relieved of the responsibility of constructing railways in Natal. Following the takeover, the Natal Government embarked on a series of surveys and engineering planning activities to expand the railway industry in the province (then an independent Colony). The planned routes included the crossing of the Drakensburg mountain range (1873). By 1875 the Natal Government Railways Law was promulgated and it gave powers to the government of the time to "..make, maintain, equip and work certain railways in the Colony of Natal" (Day, 1963: 28). This assertion by Day, suggests that the private industry had not totally died out. "This Act provided that the railway should be of 3ft 6in. gauge and, unless the Lieutenant-Governor directed otherwise, should be a single track" (Idem). A first attempt by government to actively regulate the industry which it subsequently took over in years to come. Since then there has been numerous development of the industry throughout the country. Below are some of the railway companies that developed in South Africa to-date:

Year	Company Name	Modern day South African Province
1862	-Cape Town Railway and Dock Company	Western Cape
1890	Rand Tram	Gauteng
1892	The Link-up Begins (East London & Port Elizabeth, Cape Colony)	Eastern Cape, Western Cape, and Northern Cape
1894	Nederlandsche Zuid Afrikaansche Spoorweg Maatschappij	Gauteng
1898	The Link-up Completed	Eastern Cape, Western Cape, Northern Cape, Free State and Gauteng
1900	Imperial Military Railways	Free State and Gauteng
1902	Central South African Railways	Free State and Gauteng
1916	South African Railways and Harbours	South Africa (all provinces)
1981	South African Transport Services	South Africa (all provinces)
1989	Privatisation ("Legal Succession to the South African Transport Services Act, 1989" transformed the South African Transport Services from a government department into a public company)	South Africa (all provinces)
1990	Transnet	South Africa (all provinces)
In 1997 the subsequent formation of the various Parastatal which include Transnet, PRASA (Metrorail) etc		

Back to Durban, during the construction of the first railway and subsequent launch of the first train in South Africa Durban Station was built to accommodate train travellers on the Durban-Point line which still stand today. The main building was declared the National Monument under the National Monuments Act (1969) and would be considered a Provincial Heritage Site under the NHRA, No. 25 of 1999 and the applicable Amafa KwaZulu Natali heritage legislation (KZNHA, No. 10 of 1997) and Bill (KZNHB of 21 February 2008). The little blue steam locomotive which gave birth to the train industry in south Africa is suggested to be still standing at the Old Point Duran Station which has been converted into a shopping complex. The public inventory of KwaZulu-Natal Provincial Heritage Sites list the site as follows:

SAHRA ID	9/2/407/0011
Site Name	Old Point Railway Station, 111 Point Road, Durban
Description	Main building has an arched entrance flanked by a pair of gable fronts with well proportioned windows Erected in 1890 by the NGR and played a very important part in the development of the port of Durban. This Victorian railway station dates from the eighteen-nineties when the Natal Government Railways experienced a boom. The wrought iron verandah and the b Type of site: Railway Station Previous use: railway station. Current use: offices. From the CBD take West St. (one way) towards the beach. Turn right into Point Rd and travel out. This Victorian railway station dates from the eighteen-nineties when the Natal Government Railways axed the Natal Railway Company.
Town	Durban, Point
District	Durban
NHRA Status	Provincial Heritage Status
Coordinates	N/A

2.2. Description of the affected environment

Table 1 -Springfield Flats PRASA Depot, Durban, KwaZulu-Natal Province, South Africa

Location	• The project area is located approximately 9km north and north-east of the Durban CBD, within Ethekwini Local Municipality, KwaZulu-Natal Province of South Africa. It covers approximately17 hectare and a length of 1240meters. The site centre GPS Coordinates are: 29° 48' 41.86"S 30° 59' 56.40" E.
Surrounding Towns/Townships/Industrial Zones/ Villages	• It is located within Umngeni Business Park, south of the site is the suburb of Springfield, Morningside (south-east) and Clare Hills (south-west) (Figure 3)
Land Uses in and around the study area	• Railway industry - PRASA Springfield Flats depot for train maintenance. (Government Parastatals) • Residential (suburbs of Springfield & Morningside) and small industrial south of Umngeni Road. Large industrial scale industries

	north of Umngeni Roads - Umngeni Industrial Park in which the site is located. • Government Parastatals (Eskom towers)
Land Owner(s)	• Site- PRASA • Government - City of Ethekwini and Eskom • Private -residential (Figure 9) and industrial sites
Current Conditions (on site)	• Highly disturbed landscape - mix of railway infrastructure, trucking business, Eskom infrastructure and access roads/routes (Figure)
Applicant	• Ecosolve Consulting on behalf of PRASA
Proposed Development	• Upgrade and maintenance of Springfield Flats PRASA depot
Access	• Existing national, provincial and local roads, routes and human foot paths. Umngeni Road (M19) forms the main road to site from the N2 west of the site and Chris Hani Road (M21) east , and the Alpine Road (M10) from the south suburbs of Springfield (Figure 6)
Defining natural features	• Umngeni River north of the site (Figure 6)
Zoned for	• Transport

Figure 7 - General location of the study area in relation to the suburb of Springfield, Morningside, Clare Hills and Umngeni Business Park. Also important landmarks to note is Umngeni Road (south of the site) and Umngeni River (north of the site). The N2 is located west of the site.

Figure 8- Eskom Transmission Lines (cross the site) and a Substation on the south-eastern tip of the site

Figure 9 - Rail infrastructure

Figure 10 - Access road to site (security check point (red circle) & overhead bridge - red arrow) and a unpaved truck road (left)

Figure 11- Offices and driver resting rooms

Figure 12 - Ramps (use for dump & recycling).

Figure 13 - industries (office & factories south of the depot and trucking business within the depot land)

2.2. Description of proposed activities: Infrastructure Proposed

Table 2 - List of Activities

Activity 1	• Upgrade and maintenance of Springfield Flats depot buildings and railway infrastructure
Activity 2	• Clearing of access roads and bulk infrastructure to support the newly proposed Springfield Flats depot buildings and railway infrastructure .

2.3. Needs and Desirability

Table 3 –List of activities in-line with the project scope

Activity 1	• Desktop study of the heritage value and integrity of the area under consideration and its surrounding with a particular focus on resources within Springfield Flats PRASA depot (refer to 2.4 below for detailed overview of resources in the region under consideration). • Physical identification, documentation and recording of cultural resources within the proposed development area (Springfield Flats depot).
Activity 2	• The mapping, assessment and evaluation of the heritage value and integrity of the identified heritage resources and assessment of potential impacts as a result of the proposed development on these resources.
Activity 3	• Proposing heritage management measures for inclusion in the BA and later EMP document • Making recommendations to SAHRA and provincial heritage resources authority - Amafa KwaZulu-Natali

3. METHODOLOGY

This chapter outlines the methodologies used in conducting the HIA study for the proposed Springfield Flats PRASA depot upgrade and maintenance project. The study area is located within Ethekwini Municipality. This is done in accordance to the Terms of Reference provided by the client for the appointment of heritage specialist and completion of this study. However, some areas of the report follow minimum standards for completion of professional HIA as stipulated in SAHRA minimum standard (2012) such as detailed account to the archaeological and historical background of the study area or region.

3. 1. Step I – Literature Review (Desktop Phase):

- Sources used in this study included, but not limited to published academic papers and HIA studies conducted in and around the region where the current development will take place.
- There was limited use of archival maps -one historical map and one archaeological map and one general travel map showing the proposed area of development and its surround were assessed to aid information about the proposed area of development and its surrounding.

- The above also included a review and assessment of relevant environmental and heritage legislations such as the NEMA (together with the 2010 EIA Regulations) and the NHRA.

3.2. Step II – Physical Survey

The physical survey of the study area aimed to address the following main areas of concern raised by the client in the specialist Terms of Reference:

1. To conduct an onsite verification survey for the proposed Springfield Flats PRASA depot upgrade and maintenance project area.
2. To identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located on the proposed Springfield Flats PRASA depot upgrade and maintenance project area. Use will be made of an notated maps where appropriate.

In order to address these concerns:

- The physical survey of the proposed Springfield Flats PRASA depot upgrade and maintenance project area was conducted between 31 May 2013.
- The survey covered an area of approximately 40ha - on foot and track logs of the survey were recorded using Garmin GPSmap 62s.
- The objective of the survey was to locate and identify archaeological and heritage resources and/or sites and objects, occurrence within and immediately outside the proposed development footprint. To record and map them using necessary and applicable tools and technology.
- The physical survey was deemed necessary since the desktop phase of the project yielded few known archaeological resources and other heritage/historic resources about the region in which the current study area is located. The survey also paid special attention to disturbed and exposed layers of soils as such as eroded surfaces because these areas are more likely to exposed or yield archaeological and other heritage resources that may be buried underneath the soil and be brought to the earth surface by animal and human activities such as animal barrow pits and human excavated grounds. The edges/sides of dirt roads were also inspected for possible Stone Age scatters as well as exposed Iron Age implements and other resources. Drainage and ephemeral wash were also investigated for resources.

- The following technological tools and platforms were deemed important for documenting and recording located and/or identified sites:
  - Garmin GPSmap 62s – to take Lat/Long coordinates of the identified sites and to take track logs of each of the three corridors.
  - Lenovo ThinkPad aided with Garmin Basecamp Software, Google Earth – to plot the propose corridors.
  - Quantum GIS Lisboa (1.8.0) was used to plot all the identified features and/or resources and to develop heritage maps in order to inform the heritage analysis of the proposed Springfield PRASA depot upgrade and maintenance project area.
  - Maps provided by the client before the survey also proved invaluable
  - Survey coordinates and data provided by the client were used to map the development area footprint.
  - Samsung camera – was used to take photos of the affected environment and the identified heritage sites.

3.3. Step III – Data Consolidation and Report Writing

During field work and on the return from the field the following were addressed:

1. Assessment ofthesignificanceoftheculturalresourcesintermsoftheirarchaeological,historical,scientific, social, religious, aesthetic and tourism value"
2. Description of possible impact of the proposed development on these cultural remains, according to a standard set of conventions;
3. Proposal ofsuitable mitigation measures to minimize possible negative impacts on the culturalresources;
4. Review of applicable legislative requirements - Section 3.1. of this Chapter (i.e. Chapter 3) addresses this concern as well as Section 5.5 of Chapter 5 discusses Sections of the NHRA, No. 25 triggered by the current study findings
5. Highlighting of assumptions, exclusions and key uncertainties". Chapter 4 (below) of this report address this concern.

The final step involved the consolidation of the data collected using the various sources as described above. This involved the manipulation of data through Quantum GIS. Assessing the significance and potential impact of the identified sites, discussing the finds, report writing and making recommendation on the management and mitigation measures of the identified sites

and resources as well as the impact and influence of these sites and resources on the proposed corridor.

3.4. Assessment of Site Significance in Terms of Heritage Resources Management Methodologies

The significance of heritage sites was based on four main criteria:

- Site integrity (i.e. primary vs. secondary context)
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures)
  - Density of scatter (dispersed scatter)
  - Low - <10/50m^2
  - Medium - 10-50/50m^2
  - High - >50/50m^2
- Uniqueness and
- Potential to answer present research questions.

Management actions and recommended mitigation, which will result in a reduction in the impact on the sites, will be expressed as follows:

- A - No further action necessary;
- B - Mapping of the site and controlled sampling required;
- C - No-go or relocate pylon position
- D - Preserve site, or extensive data collection and mapping of the site; and
- E - Preserve site
- F - Impacts on these sites by the development will be evaluated as follows:

Measure of Heritage Sites Significance

The following site significance classification minimum standards as prescribed by the SAHRA (2006) and approved by the ASAPA for the SADC region were used for the purpose of this report.

Table 4: Site significance classification standards as prescribed by SAHRA

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
National Significance (NS)	Grade 1	-	Conservation; National Site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; Provincial Site nomination
Local Significance (LS)	Grade 3A	High Significance	Conservation; Mitigation not advised
Local Significance (LS)	Grade 3B	High Significance	Mitigation (Part of site should be retained)
Generally Protected A (GP.A)	-	High / Medium Significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium Significance	Recording before destruction
Generally Protected C (GP.A)	-	Low Significance	Destruction

3.5. Methodology for Impact Assessment in terms of Environmental Impact Assessment Methodologies including Measures for Environmental Management Plan Consideration

The determination of the effects of environmental impact on an environmental parameter is determined through a systematic analysis of the various components of the impact. This is undertaken using information that is available to the environmental practitioner through the process of the BA. The impact evaluation of predicted impacts was undertaken through an assessment of the significance of the impacts. This is in line with specialist requirements as required by the client. For example, the request that:-

The impact methodology [should]concentrate on addressing key issues. This methodology to be employed in the report thus results in a circular route, which allows for the evaluation of the efficiency of the process itself. The assessment of actions in each phase [that should] be conducted in the following order:

- Assessment of key issues;
- Analysis of the activities relating to the proposed Springfield Flats PRASA depot upgrade and maintenance project area;
- Assessment of the potential impacts arising from the activities, without mitigation, and

- Investigation of the relevant mitigation measures for both the construction and operational phases.

The following Assessment Criteria is Used for Impact Assessment

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need. The significance of the aspects/impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The significance of the impacts will be determined through a synthesis of the criteria below:

Probability: describes the likelihood of the impact actually occurring

- Improbable:thepossibilityoftheimpactoccurringisverylow,duetothecircumstances,designor experience.
- Probable:thereisaprobabilitythattheimpactwilloccurtotheextentthatprovisionmustbemade therefore.
- Highly Probable: it is most likely that the impact will occur at some stage of the development.
- Definite: theimpactwilltakeplaceregardlessofanypreventionplansandtherecanonlyberelied on mitigatory measures or contingency plans to contain the effect.

Duration: the lifetime of the impact

- Short Term: the impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.
- Medium Term: the impact will last up to the end of the phases, where after it will be negated.
- Long Term: the impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.
- Permanent: the impact is non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

Scale: the physical and spatial size of the impact

- Local: the impacted area extends only as far as the activity, e.g. footprint

- Site: the impact could affect the whole, or measurable portion of the above mentioned properties.
- Regional: the impact could affect the area including the neighbouring residential areas.

Magnitude/Severity: Does the impact destroy the environment, or alter its function

- Low: the impact alters the affected environment in such a way that natural processes are not affected.
- Medium: theaffectedenvironmentisaltered,butfunctionsandprocessescontinueinamodified way.
- High: functionorprocessoftheaffectedenvironmentisdisturbedtotheextentwhereittemporarilyor permanently ceases.

Significance:

Thisisanindicationoftheimportanceoftheimpactintermsofbothphysicalextentand time scale, and therefore indicates the level of mitigation required.

- Negligible: the impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.
- Low: the impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.
- Moderate: the impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.
- High: The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

The significance is calculated by combining the criteria in the following formula:

Sum (Duration, Scale, Magnitude) x Probability(Table -2)

S = Significance weighting; Sc = Scale; D = Duration; M = Magnitude; P = Probability

Table 5 -The significance weightings for each potential impact are as follows:

Aspec	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severit	Low	2
	Medium	6
	High	8
Significance	Sum (Duration, Scale, Magnitude) x Probability	
	Negligible	≤20
	Low	>20≤40
	Moderate	>40≤60
	High	>60

Thesignificanceofeachactivitywasratedwithoutmitigationmeasures(WOM)andwithmitigation(WM) measures for both construction, operational and closure phases of the proposed development. To address the question of Heritage Management Plan the following table is used for Measures to be included in the EMP. This table is relevant in that it addresses key issues at the various stages of the project by also addresses how some of the key concerns that develop from a heritage point of view can be mitigated.

Table 6 -Measures for inclusion in the draft Environmental Management Plan:

OBJECTIVE: Description of the objective, which is necessary in order to meet the overall goals; these take into account the findings of the environmental impact assessment specialist studies			
Project component/s	List of project components affecting the objective		
Potential Impact	Brief description of potential environmental impact if objective is not met		
Activity/risk source	Description of activities which could impact on achieving objective		
Mitigation: Target/Objective	Description of the target; include quantitative measures and/or dates of completion		
Mitigation: Action/control		Responsibility	Timeframe
List specific action(s) required to meet the mitigation target/objective described above		Who is responsible for the measures	Time periods for implementation of measures
Performance Indicator	Description of key indicator(s) that track progress/indicate the effectiveness of the management plan.		
Monitoring	Mechanisms for monitoring compliance; the key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods and reporting		

4. ASSUMPTIONS, EXCLUSIONS AND UNCERTAINTIES

The assumptions, exclusions and uncertainties that exist in terms of the present study are discussed the following sub-sections.

4.1. Assumptions

The current study is Phase 1 HIA. As such, a historical and archival desktop study as well as a field survey were undertaken to identify tangible heritage resources located in and around the proposed development area footprint. The assumption is that a heritage social consultative process would have taken place with some of the Interested and Affected Parties (I&AP) to uncertain presence or known archaeological or heritage sites or existence of graves and

cemeteries etc within Springfield Flats PRASA depot. However, there was no formal heritage social consultation that took place as part of the study - this is due to the nature of the current study- BA not a full EIA process. The study assumes that the amount of resources located in and around the propose Springfield Flats PRASA depot represents the total amount of physical or tangible resources distributed in and around it.

4.2. Exclusions

The following exclusions or limitations have direct consequence to the study and its results:

- There was no deeds search for the proposed Springfield PRASA depot upgrade and maintenance project area - the study area is owned by the developer, SARCC (Ltd)/PRASA who is the developer. There was therefore no need to conduct a deeds search for the property.
- The survey was conducted in May, late Autumn - as such there was still high level of vegetation cover for the archaeologist/heritage surveyor to pick up all the different archaeological and heritage features in the landscape such as unmarked graves, the different Stone Age, Iron Age and Historical Archaeology material culture and artefacts.
- This forms one major limitation in terms of observing and recording all forms of archaeological and heritage sites in and immediately outside or along the proposed development area. The issue of graves was, however, addressed through informal social consultation with one of the field assistance familiar with the site (No graves or burial grounds) - (Mfundo).

4.3. Uncertainties

Heritage studies like most other specialist studies often experience many challenges during and after the physical survey of the proposed development area. From an archaeological and general heritage perspective, the assumption is often made that, the amount of identified archaeological and heritage resources during physical survey of the proposed development area represent some of the total amount of resources that exist in and around or along the development area. This is not often true because the nature of some the archaeological and heritage resources are subterranean in nature and as such, one cannot totally rule out their presence or existence within the proposed development area even though they are not

recorded and map as part of the current study. These resources may be exposed or brought to the surface of the earth during the construction phase of the project which will involve excavation for infrastructure development and clearing of vegetation and top soil in some instances. This presents one of the major uncertainties regarding the 'holistic' management or archaeological and heritage resources within and around the proposed development area.

Archaeologist and heritage specialist alike refer to discovery of such resources as chance finds and to mitigate such uncertainty, it is advisable that should such chance finds be made of archaeological and heritage resources on site, the Environmental Control Officer(ECO) responsible for the site should report them to the nearest SAHRA office or the nearest museum or call an archaeologist and heritage specialist to investigate the finds make necessary recommendations.

5. FINDINGS

5.1. Cadastral Search

The following maps of the study area were used to assess the evolutions of the landscape in and around the area in which the proposed Springfield Flats PRASA depot upgrade and maintenance project area:

The South Africa (Republic of South Africa): 1:250.000 Map of Durban (Reference: SH 36-5 Series ZS01 (1955). Reprinted by the Arm Map (NSPM), Corps of Engineers, U. S. Army Washington DC in 1955) shows the railway line in the area in which our study area is located as a normal gauge 3'6" as compared to Durban Yard (blue circle) and Point (yellow circle) in the south of the study area shown to have siding and stations (Figure 13). This can be interpreted to mean that Springfield Flats depot is younger than 1955 in terms of relative dating. This put the infrastructure within the site to an approximate age of 58 years - just below the 60 years old benchmark for the general protection of built environment and landscape features in terms of the NHRA, No. 25 of 1999.

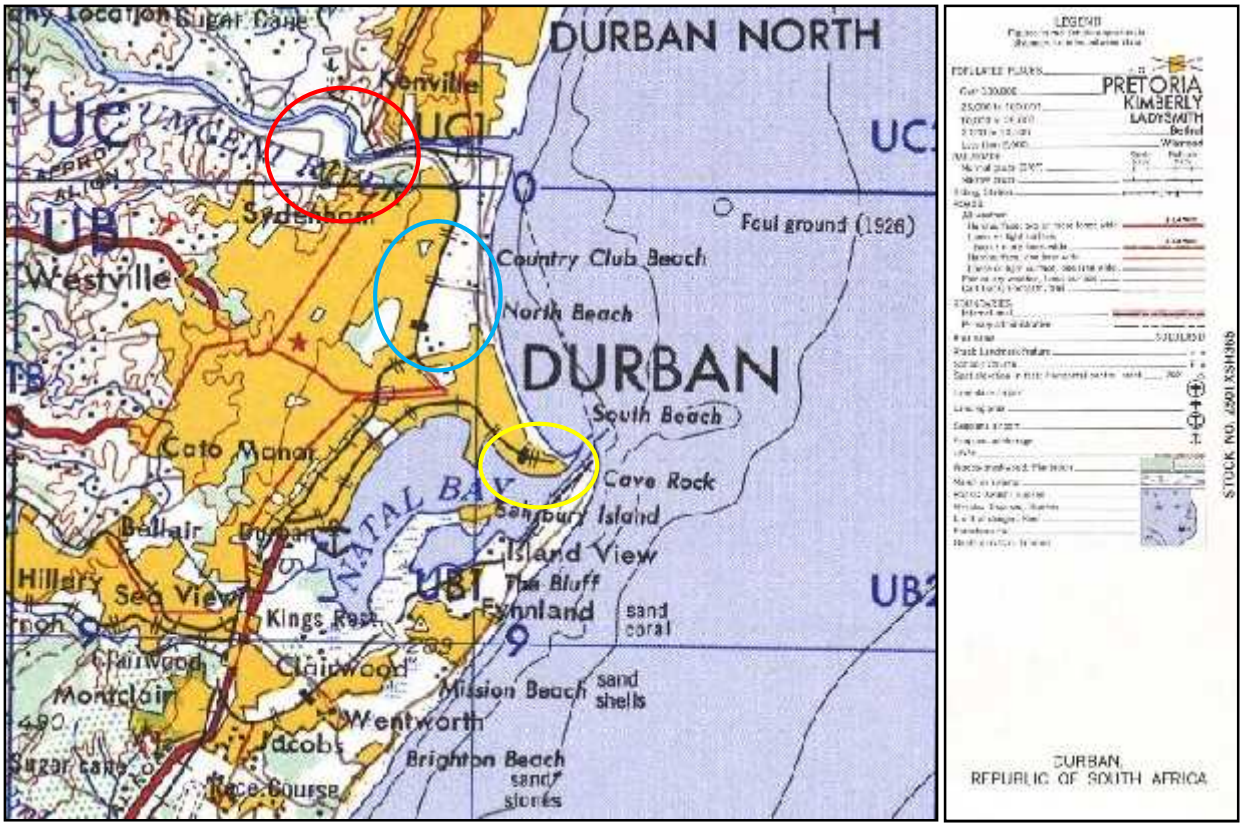


Figure 14- South Africa (Republic of South Africa): 1:250.000 Map of Durban. Reference: SH 36-5 Series ZS01 (1955). Reprinted by the Arm Map (NSPM), Corps of Engineers, U. S. Army Washington DC in 1955.

5.2.Deeds Search:

No deeds search was conducted as part of the study. The project area is known to be the property of SARCC (Ltd)/ PRASA and it involves upgrade and maintenance of existing infrastructure. No new land will be surveyed for the purposed upgrades and development in Springfield Flats PRASA depot for the current proposed development - as such title deeds search was not deemed necessary. The deeds information provided in the Arcus GIBB (2012) report is deemed sufficient enough. Deeds search plays a pivotal role in cases where there multiple stakeholders with different interests in project areas with issues such as land claims and/or presence of ancestral graves etc.

5.3. Field Survey and Identified Archaeological/Heritage Resources

The physical survey of the project area took place on the 31 May 2013. The survey did not yield any archaeological (from Stone Age to historical archaeology), historic built environment and landscape features (industrial archaeology), burial grounds and graves, and other cultural features such as places or spaces of prayer both within and immediate outside the site -as well as the general surrounding landscape as described in the 'affected environment' section above. The site is less than 60 years. Only structures that were yielded are built environment and landscape features that are not of historical significance in term of Section 34 of the NHRA, No. 25 of 1999 - the 60 year bench mark for the general protection of historical built environment and landscape features such as buildings, bridges, pavements and walls etc. The survey yielded 9 recent industrial sites which include among other built environment and landscape features on site:

- Existing lifting shop, lifting shop stabling, running shed, running shed stabling, stabling yard 1, stabling yard 2, stabling yard 3, external washing, vehicle turntable (Figure 13). These built environment and landscape features (including rail tracts, roads/paths) are further mapped up (in Figure 14) below.

Site	SPF-1
Type	Structure
Density	1 Structure
Location/Coordinates	S29 48 41.6 E31 00 00.0
Approximate Age (More than 60 0r Less than 60 years old)	Less than 60 years old
Applicable Section of the NHRA, No 25 of 1999:	Section 34
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (1)
Applicable Sections of the KZNHB, 2008	Chapter 8 and section 29 (1)
Description: The site is an existing office building used as a boardroom. The structure is in a good state and well maintained (Figure 15).	

- Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):

Field Rating	Grade	Impact	Impact Significance	Heritage Significance	Certainty of Impacts	Duration	Mitigation
LS		Localised	Low	Low significance	Probable	Construction & Operational phase	None proposed

- Note! – This is not a heritage site/resources - therefore are no further actions in terms of heritage resources management recommended for it (Figure- 15).

Figure 15- Boardroom and lounge area

Site	SPF-2
Type	Structure
Density	1 structures
Location/Coordinates	S29 48 41.2 E31 00 01.8
Approximate Age (More than 60 0r Less than 60 years old)	Less than 60 years old
Applicable Section of the NHRA, No 25 of 1999:	Section 34
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (1)
Applicable Sections of the KZNHB, 2008	Chapter 8 and section 29 (1)
Description: The site is recent building, most probable 1980s, used as drivers waiting room. The structure is in a good state and well maintained (Figure 16).	

- Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):

Field Rating	Grade	Impact	Impact Significance	Heritage Significance	Certainty of Impacts	Duration	Mitigation
LS		Localised	Low	Low significance	Probable	Construction & Operational phase	None proposed

Note! – This is not a heritage site/resources - therefore are no further actions in terms of heritage resources management recommended for it (Figure- 16).

Figure 16 -shunters/drivers office and rest room

Site	SPF-3
Type	Structure
Density	1 structure
Location/Coordinates	S29 48 41.5 E31 00 02.4
Approximate Age (More than 60 0r Less than 60 years old)	Less than 60 years old
Applicable Section of the NHRA, No 25 of 1999:	Section 34
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (1)
Applicable Sections of the KZNHB, 2008	Chapter 8 and section 29 (1)
Description: The site is a relatively old building, most probable one of the earliest structures on site and it would be 58 years old this year. Just 2 years before 60 year benchmark for heritage structures. It is used as female ablution and changing room for female drivers. The structure is in a good state and well maintained (Figure 17).	

- Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):

Field Rating	Grade	Impact	Impact Significance	Heritage Significance	Certainty of Impacts	Duration	Mitigation
LS		Localised	Low	Low significance	Probable	Construction & Operational phase	None proposed

Note! – This is not a heritage site/resources - therefore are no further actions in terms of heritage resources management recommended for it (Figure- 17).

Figure 17- Female ablution and changing rooms. Note the alterations on the structures to seal off windows and to put new doors. The facilities are also clearly gendered (strictly female- upper right)

Site	SPF-4
Type	Structure
Density	1 structure
Location/Coordinates	S29 48 42.9 E31 00 14.8
Approximate Age (More than 60 0r Less than 60 years old)	Less than 60 years old
Applicable Section of the NHRA, No 25 of 1999:	Section 34
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (1)
Applicable Sections of the KZNHB, 2008	Chapter 8 and section 29 (1)
Description: The site is a relatively old building, like SPF 3 it is most probable one of the earliest structures on site and it would be 58 years old this year. Just 2 years before 60 year benchmark for heritage structures. It is used as a shunters/coach operations control cabin (railway tracks controllers). The structure is in a good state and well maintained (Figure 18).	

- Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):

Field Rating	Grade	Impact	Impact Significance	Heritage Significance	Certainty of Impacts	Duration	Mitigation
LS		Localised	Low	Low significance	Probable	Construction & Operational phase	None proposed

Note! – This is not a heritage site/resources - therefore are no further actions in terms of heritage resources management recommended for it (Figure- 18).

Figure 18- Shunters/coach operations control cabin

Site	SPF-5
Type	Ramp and parking
Density	2 features
Location/Coordinates	S29 48 44.1 E31 00 02.8
Approximate Age (More than 60 0r Less than 60 years old)	Less than 60 years old
Applicable Section of the NHRA, No 25 of 1999:	Section 34
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (1)
Applicable Sections of the KZNHB, 2008	Chapter 8 and section 29 (1)
Description: The site complex consist of a ramp (coach repair & loading bay) and parking (with 43 bays). They are most likely to be associated with the early infrastructure on site like SPF-3 and SPF-4. The ramp area is used for coach repairs (Figure 19).	

- Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):

Field Rating	Grade	Impact	Impact Significance	Heritage Significance	Certainty of	Duration	Mitigation

					Impacts		
LS		Localised	Low	Low significance	Probable	Construction & Operational phase	None proposed

Note! – This is not a heritage site/resources - therefore are no further actions in terms of heritage resources management recommended for it (Figure- 19).

Figure 19- Coach repair (& loading bay) and parking (43 bays)

Site	SPF-6
Type	Structure
Density	1 structure
Location/Coordinates	S29 48 40.1 E30 59 43.0
Approximate Age (More than 60 0r Less than 60 years old)	Less than 60 years old
Applicable Section of the NHRA, No 25 of 1999:	Section 34
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (1)
Applicable Sections of the KZNHB, 2008	Chapter 8 and section 29 (1)
Description: The site is a water pump house also relatively old, mostly likely associated with the early infrastructure on site like SPF-3 and SPF-4. (Figure 20).	

- Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):

Field Rating	Grade	Impact	Impact Significance	Heritage Significance	Certainty of Impacts	Duration	Mitigation
LS		Localised	Low	Low significance	Probable	Construction & Operational phase	None proposed

Note! – This is not a heritage site/resources - therefore are no further actions in terms of heritage resources management recommended for it (Figure- 20).

Figure 20- Pump house. Note the water pipes and the electric power box

Site	SPF-7
Type	Turn-table
Density	1 Feature
Location/Coordinates	S29 48 39.8 E30 59 42.2
Approximate Age (More than 60 0r Less than 60 years old)	Less than 60 years old
Applicable Section of the NHRA, No 25 of 1999:	Section 34
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (1)
Applicable Sections of the KZNHB, 2008	Chapter 8 and section 29 (1)
Description: The site is a coach turntable (Figure 21).	

- Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):

Field Rating	Grade	Impact	Impact Significance	Heritage Significance	Certainty of	Duration	Mitigation

					Impacts		
LS	3A	Localised	Low	Low significance	Probable	Construction & Operational phase	None proposed

Note! – This is not a heritage site/resources - therefore are no further actions in terms of heritage resources management recommended for it (Figure- 21).

Figure 21- Coach turntable

Site	SPF-8
Type	Structure
Density	
Location/Coordinates	S29 48 40.9 E30 59 47.8
Approximate Age (More than 60 0r Less than 60 years old)	Less than 60 years old
Applicable Section of the NHRA, No 25 of 1999:	Section 34
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (1)
Applicable Sections of the KZNHB, 2008	Chapter 8 and section 29 (1)
Description: The site is an electric generation substation. It is also relatively old, mostly likely associated with the early infrastructure on site like SPF-3, SPF-4 and SPF-6 (Figure 22).	

- Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):

Field Rating	Grade	Impact	Impact Significance	Heritage Significance	Certainty of Impacts	Duration	Mitigation
LS		Localised	Low	Low significance	Probable	Construction & Operational phase	None proposed

Note! – This is not a heritage site/resources - therefore are no further actions in terms of heritage resources management recommended for it (Figure- 22).

Figure 22- Substation

Site	SPF-9
Type	Running shed and associated structures (spare shed & offices)
Density	Approximately 10 structures in total
Location/Coordinates	S29 48 43.2 E30 59 57.4
Approximate Age (More than 60 0r Less than 60 years old)	Less than 60 years old
Applicable Section of the NHRA, No 25 of 1999:	Section 34
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (1)

Applicable Sections of the KZNHB, 2008	Chapter 8 and section 29 (1)
Description: The site complex consist of running shed, offices (red arrows) and other operational facilities such as storage shed and offices. Security check point (yellow arrow) as well as a storage building(green arrow). Storage facility (flammable store) whose position is indicated by the green arrow is relatively older than the running shed and other associated structures (Figure 23). The complex is shown in a purple stipple circle in Figure 24.	

- Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):

Field Rating	Grade	Impact	Impact Significance	Heritage Significance	Certainty of Impacts	Duration	Mitigation
LS		Localised	Low	Low significance	Probable	Construction & Operational phase	None proposed

Note! – This is not a heritage site/resources - therefore are no further actions in terms of heritage resources management recommended for it (Figure- 22).

Figure 23- The site complex consist of running shed, offices (red arrows) and other operational facilities such as storage rooms/shed and offices. Security check point (yellow arrow) as well as a storage building (green arrow).

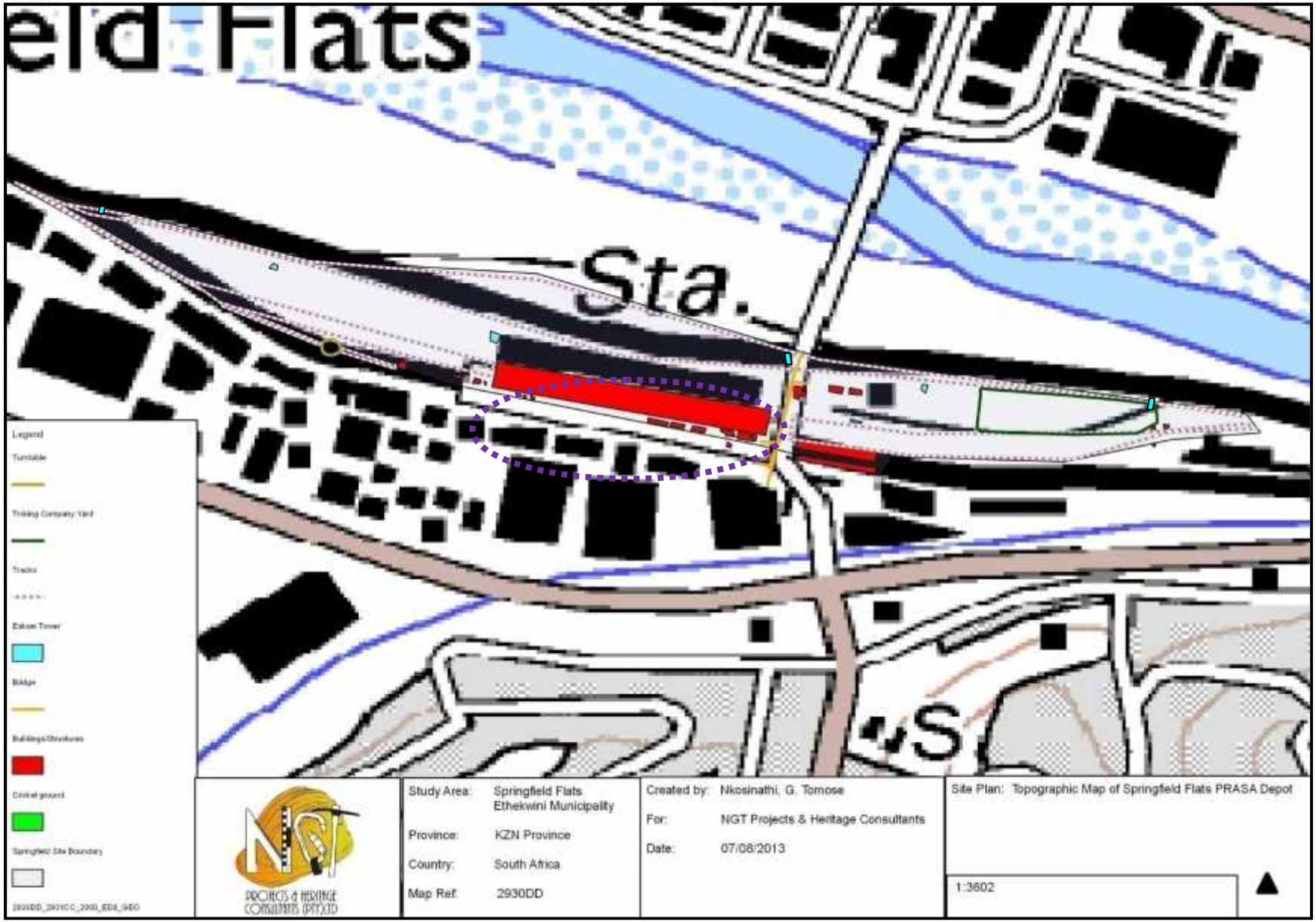
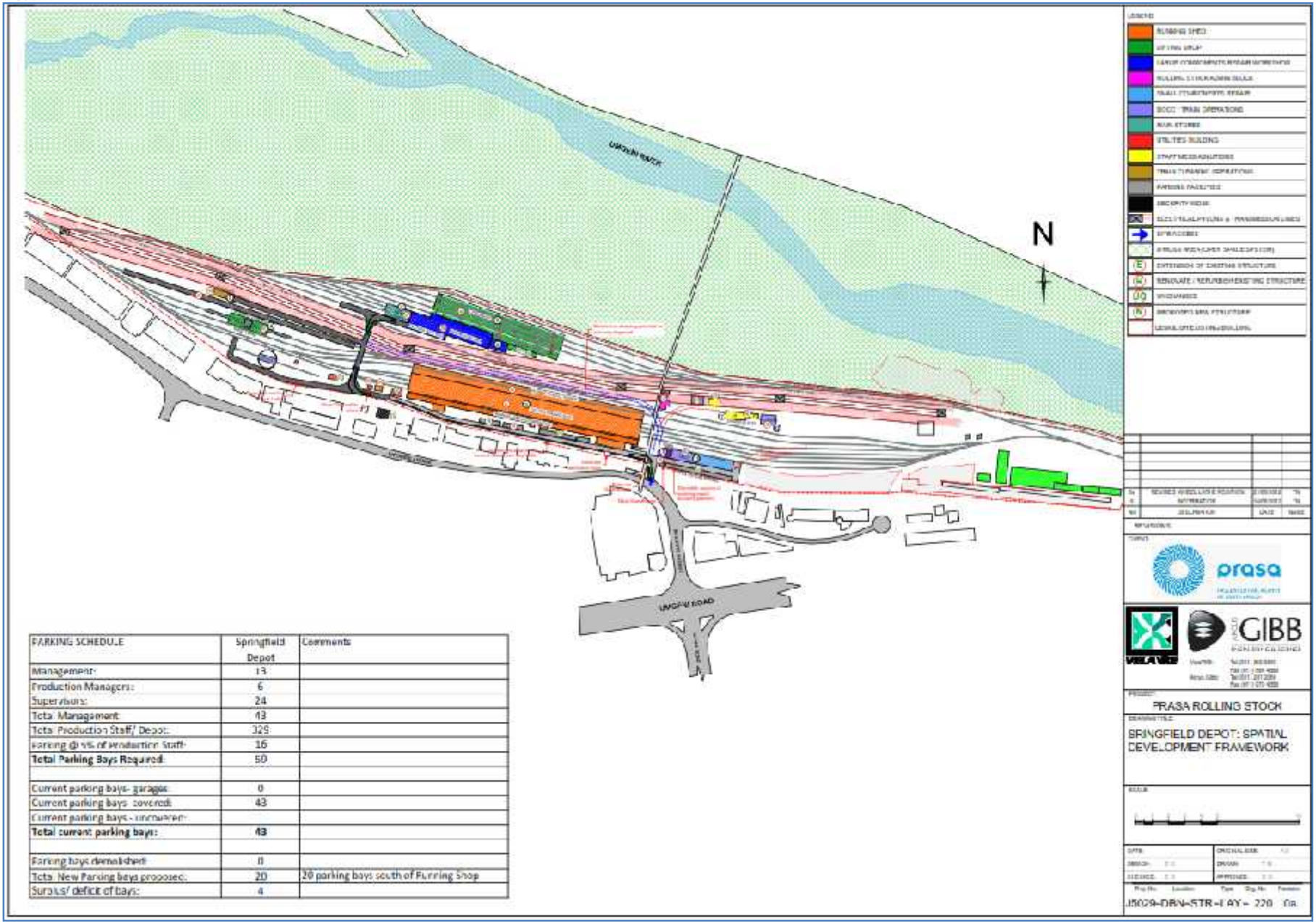


Figure 24- Distribution of existing depot buildings, rail infrastructure (e.g. tracks etc), Eskom towers and overhead bridge.

6. FIELD SURVEY RESULTS AND PROPOSED INFRASTRUCTURE

The field work conducted on the 31st May 2013 yielded 9 sites complexes all which are recent built environment and landscape features under 60 years old - 58 years to be precise (Figure 24). All the identified features do not qualified to be referred to as historic structures nor do they meet the minimum requirements for the general protection of built environment and landscape features in terms of Section 34 of the NHRA, No. 25 of 1999; KZNHA, No.10 of 1997 (Section 26 (1)); and KZNHB, 2008 (Chapter 8 and section 29 (1)). The identified features included: existing boardroom and lounge (SPF-1), shunters/drivers office and rest room (SPF-2), female ablution and changing rooms (SPF-3), shunters/coach operations control cabin (SPF-4), coach repairs (& loading bay) and parking (SPF-5), pump house (SPF-6), turntable (SPF-7), substation (SPF-8) and running shed and associated structures (like offices, store shed and flammable store, security check point/ guard house etc) (Figures: 15-23). Out of the nine built environment and landscape sites identified approximately one will be demolished to make way for the newly proposed upgrades and maintenance, section of SPF-5 (Figure 19). The rest of the structures will be upgraded to suit requirements of the new PRASA rolling stock (Figure 25). Because there were no heritage sites in form archaeological, industrial built environment and landscape, burial grounds and graves, and other places of cultural significance such as sites of gathering, worship and prayer or initiation sites - there are no reasons from a heritage management point of view as to why the proposed development should not go proceed as planned. However, it has to be noted that some archaeological and heritage resources such as unmarked graves are subterranean in nature and may have been missed by the current study. Since the newly proposed development will involve excavations, the he developer should take note of this. In cases such resources are unearthed during the excavation processes for infrastructure development at Springfield depot, necessary measures to mitigate them should be taken like stopping the excavation or construction and informing Amafa KwaZulu-Natali and calling an archaeologist on site to investigate the finds and make recommendation on how they can be mitigated.



PARKING SCHEDULE	Springfield Depot	Comments
Management:	13	
Production Managers:	6	
Supervisors:	24	
Tota Management:	43	
Tota Production Staff/ Depot:	328	
Parking @ 15% of production Staff:	16	
Total Parking Bays Required:	59	
Current parking bays- garages:	0	
Current parking bays- covered:	43	
Current parking bays - uncovered:		
Total current parking bays:	43	
Parking bays demolished:	0	
Tota New Parking bays proposed:	20	20 parking bays south of Running Shop
Surplus/ deficit of bays:	4	

Figure 25- Proposed Springfield Flats PRASA depot Spatial Development Framework - showing the proposed infrastructure at Springfield Flats PRASA depot against the existing infrastructure (under 60 years old -58 years old in terms of relative dating).

7. CONCLUSIONS

Based on the fact that the identified built environment and landscape features are not heritage resources in terms of the prescribed heritage policies and/or legislations and existing literature about the project area, observations made during the physical survey of the proposed development area, assessment and evaluation methods using SAHRA minimum standards for evaluation and grading of archaeological and other heritage resource - the following conclusions and recommendations are made about the proposed Springfield Flats PRASA's depot modern maintenance deports upgrade:

- It is conclude that in terms of heritage resources management there are no objections to the project.
- There are no negative perceptions about the it impact of the proposed infrastructure on the identified built environment and landscape features which are all below the prescribed 60 year old benchmark for the general protection of built environment
- It is also recommended that Amafa' KwaZulu-Natali approves the project in terms of cultural resources management since there were no heritage resources found within and immediately outside the project area.
- The proposed project will further in hence the aesthetic value of the site, making it modern and relevant refer to Figure 26 for the architectural model of the depot once completed. For Springfield Concept Technical Solution refer to Appendix 1.

8. RECOMMENDATIONS

- It is recommended that Amafa' KwaZulu-Natali approve the project in terms of cultural resources management since there were no heritage resources (i.e. archaeological, built environment and landscape, and burial grounds and graves, as well as places of worship or initiation) found within and immediately outside the project area.

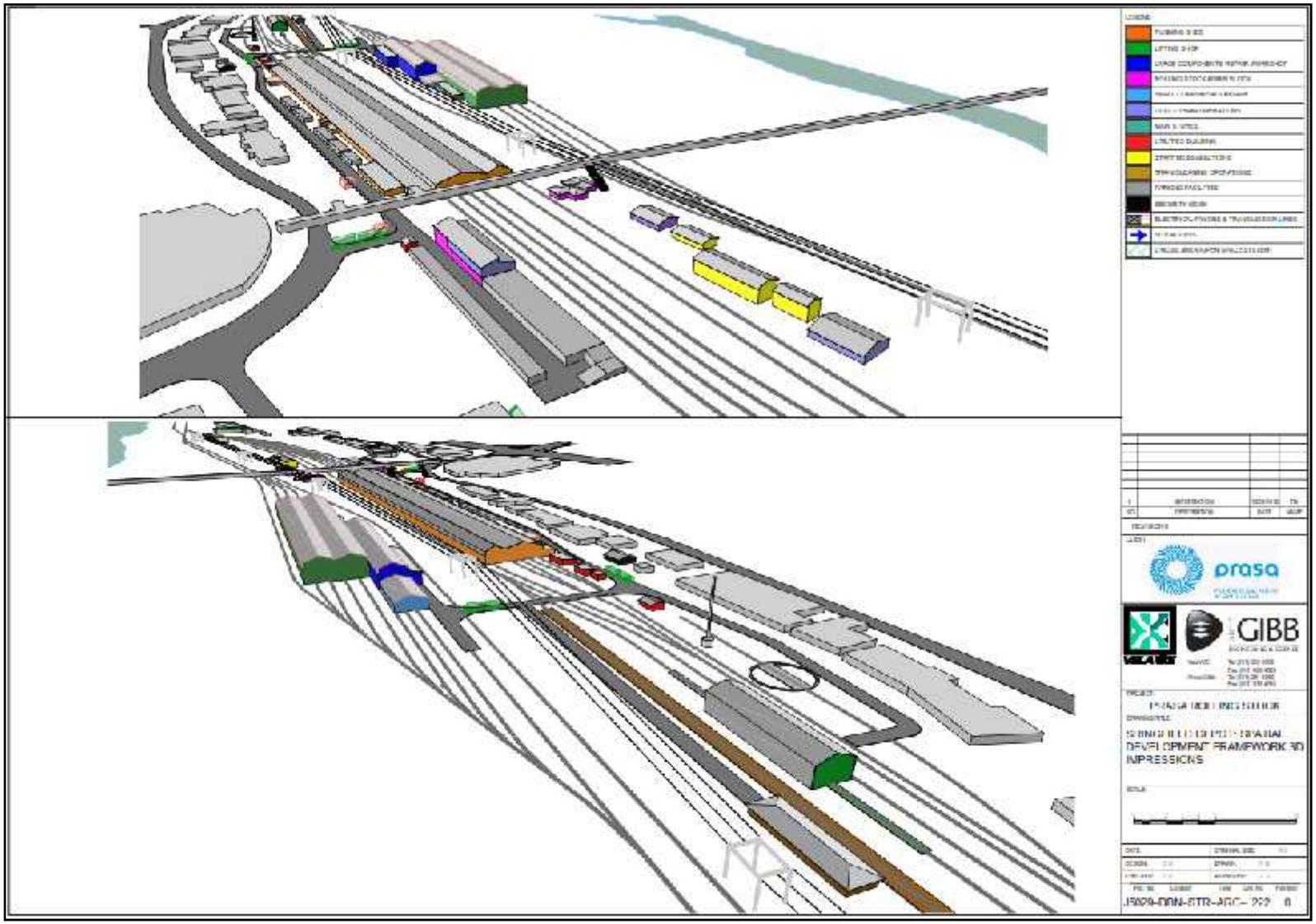


Figure 26 - An architectural model of Springfield Flats on completion

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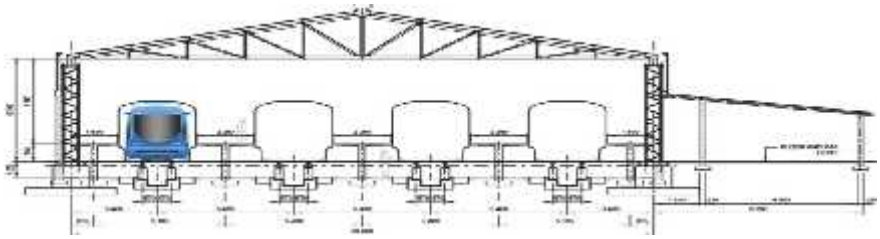
Appendix 1: Springfield Concept Technical Solution

Springfield Work Packages

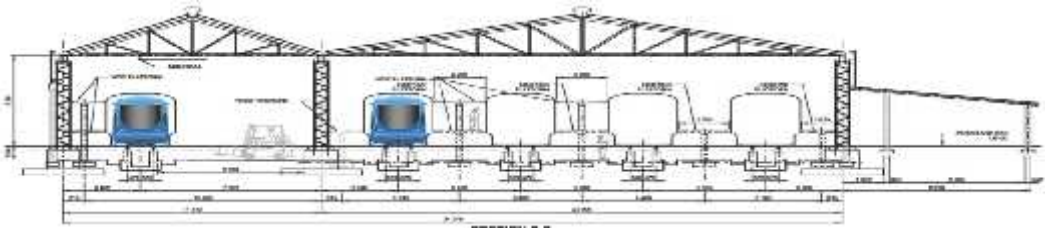
Work Package	High-level Scope of Work
Running Shed, other work areas, and staff support facilities	• Secure existing shed for construction • Construct additional pit line • Construct forklift access road • Construct access platforms • Install mechanical and electrical equipment • Refurbish other work areas, and staff support facilities
Lifting Shop including component repairs, storage facilities, other work areas, and staff support facilities	• Construct new lifting shop • Construct bogie drop pit, bogie repair road, reinforced floor for lifting jacks • Fit out component repair workshops/work areas, stores, and staff support facilities • Install mechanical and electrical equipment
Buildings (admin, train ops - DOCC, and training facilities)	• Confirm construction requirements
• Intensive cleaning • Under floor wheel lathe	• Construct wheel lathe facility • Construct intensive cleaning facility • Install building mechanical and electrical equipment • Supply and install specialised mechanical equipment

Running Shed Cross Section

Existing Layout

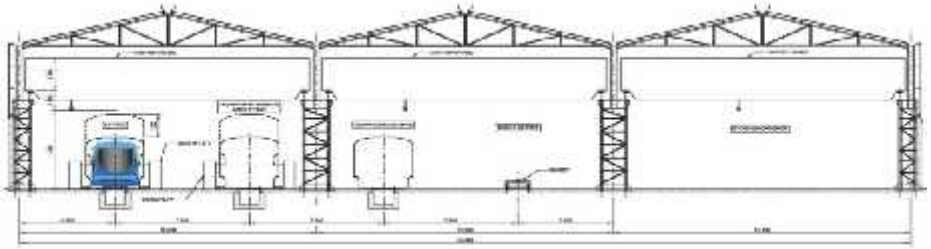


Preferred Layout
Addition to
existing building



Lifting Shop Cross Section

Preferred Layout
Springfield



Work Package	High-level Scope of Work
Staging yard remodelling – perway	•Construct intensive cleaning facility lines •Construct wheel lathe line •Construct test track
Staging yard remodelling – electrical	•Construct new OHTE, gantry, mast pole foundations
Staging yard remodelling – signalling	•Installation new signalling equipment •Fitment of DOCC building and interlocking
Work Package	High-level Scope of Work
Long lead time materials	• Procurement of rails • Procurement of sleepers

	• Procurement of turnouts • Procurement of lathe • Procurement of wheel measuring equipment • Procurement of lifting jacks • Procurement of drop pit jack
Investigations (BY PRASA)	• Geotechnical surveys • Topographical surveys • EIA assessments • Town planning
Detection and relocation of existing utilities	• Confirmation of existing utilities • Relocate to new position
Demolition of identified structures	• Demolish of identified structures as per the demolition schedule