



Republic of Zambia

# Report of the Auditor General on the Road Projects Under the

## Road Development Agency (RDA)

for the Period  
January 2012 to December 2015

Price: K60:00





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## **Abbreviations**

<b>AFDB</b>	African Development Bank
<b>ARS</b>	Audit Reference Sheet
<b>BCHOD</b>	Brian Colquhoun, Hugh O'Donnell
<b>BOQ</b>	Bill of Quantities
<b>BoZ</b>	Bank of Zambia
<b>BSM</b>	Bitumen Stabilised Material
<b>CBR</b>	California Bearing Ratio
<b>CFI</b>	Construction Finance Initiative
<b>CSB</b>	Crushed Stabilised Base
<b>CPs</b>	Cooperating Partners
<b>DANIDA</b>	Danish Development Assistance
<b>DCP</b>	Dynamic Cone Penetrometer
<b>EC</b>	European Commission
<b>EIZ</b>	Engineering Institution of Zambia
<b>ERB</b>	Engineers Registration Board
<b>GDB</b>	German Development Bank
<b>GCC</b>	General Conditions of Contract
<b>GRZ</b>	Government of the Republic of Zambia
<b>IPC</b>	Interim Payment Certificate
<b>JICA</b>	Japanese International Cooperation Agency
<b>KM</b>	Kilometre
<b>LHS</b>	Left Hand Side
<b>LPO</b>	Local Purchase Order
<b>LS – MFEZ</b>	Lusaka South Multi Facility Economic Zone
<b>MFEZ</b>	Multi Facility Economic Zone



<b>NCC</b>	National Council for Construction
<b>NDF</b>	Nordic Development Fund
<b>NRFA</b>	National Road Fund Agency
<b>OAG</b>	Office of the Auditor General
<b>RDA</b>	Road Development Agency
<b>RDAPC</b>	Road Development Agency Procurement Committee
<b>ROADSIP</b>	Road Sector Investment Programme
<b>RHS</b>	Right Hand Side
<b>RSAWP</b>	Road Sector Annual Work Plan
<b>SABS</b>	South African Bureau of Standards
<b>SATCC</b>	Southern Africa Transport and Communication Commission
<b>SANS</b>	South African National Standards
<b>SCC</b>	Special Conditions of Contract
<b>TCS</b>	Toll Collection System
<b>UNWTO</b>	United Nations World Tourism Organization
<b>VAT</b>	Value Added Tax
<b>VO</b>	Variation Order
<b>WB</b>	World Bank
<b>ZPPA</b>	Zambia Public Procurement Authority
<b>4WD</b>	4 Wheel Drive

## **Executive Summary**

The audit of road and related infrastructure under the Road Development Agency (RDA) for the period October 2012 to December 2015 was conducted in accordance with the provisions of Article 250 of the Constitution of Zambia, Public Audit Act of 1980 and Public Finance Act No. 15 of 2004.

The objectives of the audit were among others to ascertain whether procurement procedures were followed in the award of the contracts, projects were administered in accordance with contract agreements and whether the expenditure was in conformity with the Laws of Zambia.

The following were observed

**i. Failure to Pay Contractors on Time**

There were delays in settling of interim payment certificates resulting in incurring of interest and standing time charges. In addition, in some cases, commencement orders were issued prior to the settlement of advance payments.

**ii. Late Engagement of Supervising Consultants**

There were delays in the engagement of supervising consultants for periods ranging from one (1) to twelve (12) months. Thus projects were implemented without adequate supervision.

**iii. Lack of Detailed Engineering Drawings**

Most projects commenced without detailed road engineering designs resulting in understatement of bills of quantities which consequently led to increases in contract sum once the drawings were in place. This further led to delayed completion of projects.

**iv. Change of Key Personnel without RDA Approval**

It was observed that contractors changed key personnel without approval from RDA.

**v. Single Sourcing (Direct Bidding)**

Although, RDA obtained authority to single source from ZPPA, most projects in question did not meet the criteria for single sourcing.

**vi. Over Procurement of Projects**

It was observed that RDA procured works at the unconstrained budget as opposed to the approved budget by Parliament.

**vii. Variations**

There were variations on various contracts ranging from 50 percent to 400 percent which were considered excessive.

**viii. Poor Workmanship – non adherence to Project Specification**

It was observed that specifications were not adhered to resulting in poor quality works.

**ix. Award of Contract for Detailed Engineering Road Designs to the Contractor**

In certain cases, the contractors building roads were also engaged to do the detailed engineering road designs for the same roads.

**x. Single Sourcing of Subcontractors**

There was no evidence that the selection and award of tenders to subcontractors on all the contracts followed a competitive and transparent process.

## **1. Introduction**

The audit of road and related infrastructure under the Road Development Agency (RDA) for the period October 2012 to December 2015 was conducted in accordance with the provisions of Article 250 of the Constitution of Zambia, Public Audit Act of 1980 and Public Finance Act No. 15 of 2004.

## **2. Audit Objectives**

The objectives of the audit were among others to ascertain whether procurement procedures were followed in the award of the contracts, projects were administered in accordance with contract agreements and whether the expenditure was in conformity with the Laws of Zambia.

## **3. Background**

The RDA was created in 2002 following the enactment of the Public Roads Act No. 12 of 2002. According to the Act, the functions of RDA are to plan, manage and coordinate the road network in the country.

The Act further created the National Road Fund Agency (NRFA) which is responsible for mobilising resources for funding the road sector and administering the Road Fund.

The Government, with assistance from its cooperating partners (CPs) that comprised the World Bank (WB), European Commission (EC), Danish Development Assistance (Danida), Japanese International Cooperation Agency (JICA), Nordic Development Fund (NDF), Africa Development Bank (AfDB) and German Development Bank (KfW) developed a Road Sector Investment Programme (ROADSIP). The goal was to systematically maintain and rehabilitate a core road network and to bring it to a maintainable standard by the year 2013. ROADSIP I covered the period from 1997 to 2007 and ROADSIP II covered the period from 2008 to 2013. The total core road network targeted was 40,113 km comprising 3,088 km of trunk roads, 3,691 km of main roads, 13,707 km of district roads, 5,294 km of urban roads and 14,333 km of primary feeder roads.

In October 2012, the Government launched the LINK ZAMBIA 8000 project which was divided into three (3) phases which would result in the construction of a total of 8,000 km of roads over a five (5) year period. The first phase of the project would cover 2,290 km at an estimated total cost of about US\$1.5 billion; the second phase would cover 3,049

km of the road network worth approximately US\$2.2 billion and the third phase would involve upgrading of 2,862 km of the road network at a cost of about US\$1.76billion.

Further, in 2013, the Government through the Road Development Agency (RDA), launched the PAVE ZAMBIA 2000 Programme. In this programme, the Government was to rehabilitate and construct 2,000 km of urban roads using concrete paving bricks technology. In this programme, it was anticipated that the cost of construction and maintenance would be lower than the conventional road construction methods of asphalt and surface dressing. The project was expected to take five (5) years at a cost K1.5 billion.

#### **4. Scope and Methodology**

This report is as a result of an audit carried out at the Road Development Agency. It covers construction projects under RDA procured between 1<sup>st</sup> October 2012 and 31<sup>st</sup> December 2015. The audit was planned and performed such that sufficient evidence, explanations and all necessary information were obtained to reach reasonable conclusions. In conducting the audit, tests of accounting records maintained at the Agency, the National Road Fund Agency and the Ministry of Works and Supply such as the accounting documents, tender documents, contracts, certificates of completed works, progress reports and others were reviewed and physical inspection of projects was conducted.

The Auditor General, in line with provisions of the Public Audit Act procured the services of a road engineer from National Road Fund Agency (NRFA) and also included a procurement specialist from Auditor General's Office as part of the audit team.

The audit was conducted in two phases. Phase I was conducted between January and September 2015 and a management letter was issued to RDA management while an Audit Reference Sheet was issued to the Permanent Secretary for the Ministry of Works and Supply in November 2015. Phase II was conducted during the period from January to October 2016 following a request by the Permanent Secretary – Works and Supply to extend the audit to 31<sup>st</sup> December 2015. Phase II therefore involved verification of the management responses to the earlier management letter and updating financial and physical progress on each project to current status which was December 2016 when the audit was finalised. Phase II also involved auditing of projects procured in 2015.

Matters raised in this report therefore are those that remained outstanding following the verification conducted with RDA management in January 2017.

The status of the projects is as a result of the physical inspection conducted in 2015, 2016 and also incorporates progress as reported in the August to October 2016 progress reports, whichever was considered to be the latest report.

The standards for the physical verification were based on SATCC specifications, road and bridge works – September 1988 (reprinted 2001).

During the period under review, the RDA constructed mainly four (4) types of roads with road surfaces and road bases as shown in the table below.

<b>Types Road Surface</b>	<b>Details</b>
Hot Mix Asphalt	Comprises of approximately 95 percent stone, sand, or gravel bound together by bitumen.
Seals	Bitumen is placed on the road and stones are spread to provide the wearing surface (Driving Surface).
Single Surface Dressing	One layer of bitumen is placed on the road and one layer of stones is spread to provide the wearing surface (Driving Surface).
Double Surface Dressing	One layer of bitumen is placed on the road and one layer of stones is spread to provide the wearing surface (Driving Surface) and 2 <sup>nd</sup> layer of bitumen is placed on the road and 2 <sup>nd</sup> layer stones is spread to provide the wearing surface (Driving Surface).
<b>Types of Road Base</b>	
Crushed Stone Base	Comprises an unbound mixture of coarse and fine crushed stone.
Cement Stabilised Base	Comprises a cement bound mixture of specially selected gravel with cement as a binder material.
Neat Base	Comprises an unbound mixture of specially selected gravel without any binding material.
Bitumen Stabilised Base	Comprises a bitumen bound mixture of specially selected gravel with bitumen as a binder material.

In addition, in order to ascertain whether the roads and related works were done according to specifications, the following tests were carried out on selected roads:

**i. Test 1 - Trial Pit Test for Road Layers, Namely Road Surfacing, Road Base and Subbase**

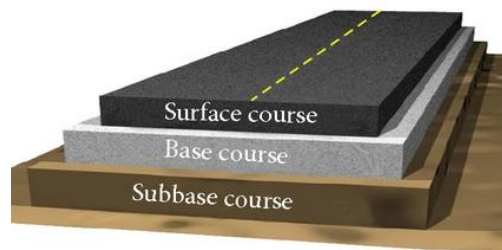
**• Criteria/ Purpose**

- Trial pits are undertaken to determine the quality and the total thickness of the stabilised soil/ crushed stone.

- The required base course should be at least 150 mm or as per specification with a maximum tolerance of 27 mm (minimum 123 mm).
- The required surface course varies in accordance with contract specifications.
- The sub base course should be at least 150 mm or as per specification with a maximum tolerance of 27 mm (minimum 123 mm).

- **Methodology**

Digging in the road shoulder to expose and measure the thickness of various road layers.



*Typical road cross section*

- **Specification**

- **SATCC 34.03 Pavement Layers Constructed from Gravel Obtained from Existing Layers**

Where the underlying layer has not been reconstructed or reworked but only rolled, or where no work has been done on it, quantities shall be calculated with the aid of cross-sections taken of the layer before and after construction, subject to the provisions of Clause 1220.

Where the material consists of recovered pavement material in part and imported material in part, the quantity of imported material obtained from cut or borrow shall be paid for under Item 34.01, calculated in accordance with the volume relation of the respective materials.

- **34.04 In situ Reconstruction of Existing Pavement Layers**

Where the material consists of recovered pavement material in part and imported material in part, the quantity of imported material obtained from cut or borrow shall be paid for under Item 34.01, calculated in accordance with the volume relation of the respective materials.

- **Possible Causes of Failure of Road Base**

- Inadequate material dumped as base,
- Inadequate cement added,
- Poor selection of material,
- Poor workmanship,
- Reduced thickness,
- Poor supervision by the consultant/ RDA, and

- **Risks**

- Poor load transfer in the pavement which can lead to premature failure and shorten the life of the road, and
- Paying for inadequate base.

**ii. Test 2 - Core Drilling on Asphalt, Stabilised Road Base and Sub-base**

- **Criteria/Purpose**

- Coring is performed to evaluate construction control and physical properties of Asphalt and stabilised soils,
- Coring is conducted to determine the quality and the total thickness of the stabilised soil, and
- The required bound stabilised base should be at least 150mm.

- **Methodology**

A mobile core drilling machine is used to extract cores from the existing road layers such as asphalt and road base/ subbase.



- **Specifications**

For stabilised Road Base 150mm thickness or 123mm minimum thickness as per SATCC clauses 3405 and 7205 or as per thickness specification of a particular contract.

- **Possible Causes**

- Inadequate material dumped as base,
- Poor workmanship,
- Inadequate cement in base,
- Poor supervision, and
- Poor materials selected.

- **Risks**

- Poor load transfer which can lead to premature failure of the road, and
- Paying for inadequate base.

**iii. Test 3 - Visual Inspection for Various Physical Conditions About Functionality of the Road**

- **Criteria/Purpose**

To check the physical condition of the pavement (e.g. potholes, rutting, remedial works), functionality of road (e.g. walkways) and any other required physical attributes

- **Methodology**

Visual inspection by looking at the road and identifying defects of the road and associated road infrastructure.

- **Specification**

Depends on the physical attribute being visually inspected e.g. longitudinal streaking/ loss of stone.

To check construction tolerances and finish requirements, SATCC series 4000 on Asphalt Pavement and seals.

- **4312 Defects**

Where, in the opinion of the Engineer, any unacceptable loss of stone from or bleeding of the road surface that may occur during the course of the Contract or during the maintenance period can be attributed to the Contractor not observing any of the requirements of the Specifications, not using the correct rates of application, or to any other omission or fault on the part of the Contractor, any corrective work ordered by the Engineer shall be at the Contractor's cost, including the supply, pre-coating, stockpiling at selected sites and later removal if not used, of any aggregate reserved for corrective work during the period of maintenance or thereafter.

Where the reason for bleeding or loss of stone, in the opinion of the Engineer, cannot be attributed to any fault or neglect on the part of the Contractor, the Employer shall pay at the tendered rates for the cost of any remedial measures taken on the instructions of the Engineer.

- **Possible Causes of Surface Irregularity**

- Inadequate design and poor construction method,
- Poor workmanship by the contractor, and
- Poor supervision.

- **Risks**

- Poor road safety, and
- Poor load transfer which will lead premature failure of the road.

**iv. Test 4 - Communication /Electricity Service Cables**

- **Criteria/Purpose**

Check compliance with the requirements of clause SATCC 5.8 regarding proximity and height clearances for power / communication lines to the road

- **Methodology**

Visual inspection by looking and measuring proximity and height clearance for power/ communication lines to road infrastructure.

- **Specification**  
Geometric Standard SATCC 5.8
- **Possible Causes**
  - Inadequate design,
  - Poor supervision, and
  - Poor workmanship.
- **Risk**  
Poor road safety

v. **Test 5 - Road Signs Retro Reflectivity**

- **Criteria/Purpose**  
Check retro reflectivity of road signs if it complies with SABS 1519 Retro reflectivity, or night time visibility of signs is essential for efficient traffic flow, driving comfort, and road safety in general. Road signs are visible at night because the light from headlights is reflected back into drivers' eyes by retro reflectors embedded into the signs.
- **Methodology**  
Using the hand held Road Vista 922 to simulate night reflectivity on road signs during the day.
- **Specifications**  
SABS 1519 / SANS 1519
- **Possible causes**
  - Deliberate action by the contractor to maximise profit by using cheap material, and
  - Poor supervision.
- **Risks**
  - Poor road safety, and
  - Paying of substandard signs.

**vi. Test 6 – 3 m Straight Edge – Rutting/ Surface Irregularity**

- **Criteria/Purpose**

To check the construction tolerances and finishing requirements as per requirements of SATCC 4212 construction tolerances

- **Methodology**

Placing a 3 metre steel Straight Edge across/ longitudinal on the road to measure surface irregularity under the road.

- **Specifications**

SATCC 4212

- **Rutting**

- To check construction tolerances and finish requirements as per requirements of SATCC 4212 construction tolerances,
- To observe visual road aesthetics and functional requirements, and
- The maximum rutting (depression) on a new road should be not more than 10mm.

- **SATCC 1218 Remedial Work**

When any part of the Works or any equipment or material is found, upon examination by the Engineer, not to conform to the requirements or at any stage before final acceptance is damaged so that it no longer conforms to the requirements of the Specifications, the Engineer may order its complete removal and replacement, at the Contractor's expense, with satisfactory work, equipment or material, or he may permit the Contractor to apply remedial measures in order to make good any such defects or damage. The actual remedial measures taken shall at all times be entirely at the Contractor's own initiative, risk and cost, but subject to the Engineer's approval regarding the details thereof.

In particular, remedial measures shall ensure full compliance with the requirements of the Specifications of the final product, shall not endanger or damage any other part of the Works, and shall be carefully controlled and

submitted to the Engineer for examination when completed or at any intermediate stage as may be required.

For the guidance of the Contractor, an indication is given below of what would normally be required in the more common cases of defects or damage, but the Engineer will in no way be bound to accept or approve the remedial works.

- **Possible Causes of Surface Irregularity**
  - Poor design, and
  - Poor compaction.
- **Risks**
  - Safety concerns for vehicles due to uneven road surface which can cause road accidents,
  - Payment for poor quality, and
  - Premature failure of the road due to water ingress (sipping) resulting from poorly constructed and bench to shoulder which leads to potholes.

**vii. Test 7 - Schmidt Hammer Test for Concrete**

- **Criteria/Purpose**
  - Test is taken to check the in situ strength of concrete, and
  - Required strength of concrete for walkway is 25 Mpa.
- **Methodology**

Using a hand held Rebound Schmidt Hammer to measure the strength on existing concrete.
- **Specifications**

Standard ASTM C805 / C805M Standard Test Method for Rebound Number of Hardened Concrete
- **Possible Causes**
  - Poor workmanship, and

- Poor supervision.
- **Risk**  
Paying for substandard works

## 5. Administration

The Public Roads Act No. 12 of 2002 provides for among other things the composition of the Agency consisting of part time members appointed by the Minister responsible for Works and Supply as follows:

- i. A representative of the National Council for Construction,
- ii. A representative of the Zambia National Farmers Union,
- iii. A representative of the National Science and Technology Council,
- iv. A representative of the Engineering Institution of Zambia,
- v. A representative of the Chartered Institute of Transport,
- vi. A representative of :
  - The ministry responsible for works and supply,
  - The ministry responsible for communication and transport,
  - The ministry responsible for local government and housing,
  - The ministry responsible for finance,
  - The ministry responsible for tourism,
  - The ministry responsible for agriculture, and
  - The Attorney General.
- vii. The Director of the Road Transport and Safety Agency,
- viii. The Director of the National Road Fund Agency, and
- ix. One other person.

The Director of the Road Transport and Safety Agency and the Director of the National Road Fund Agency are ex-officio members of the Agency and have no vote.

The Chairperson is to be appointed by the Minister responsible for Works and Supply, while the Vice Chairperson is elected by the members of the Agency from among their number.

The Agency reports to the Committee of Ministers on Road Maintenance Initiative at such times and such places as the Ministry may determine.

The day to day administration of the RDA is the responsibility of the Chief Executive Officer who is appointed by the Agency. The Chief Executive Officer is assisted by the Directors responsible for Planning and Design, Corporate Services, Construction and Maintenance who are appointed on three (3) year renewable contracts while the rest of staff is appointed on permanent and pensionable basis.

## **6. Source of Funds**

According to the Act, the funds of the Agency shall consist of such moneys as may:

- i. Be appropriated to the Agency by Parliament for the purpose of the Agency,
- ii. Be allocated to the Agency from the Road Fund,
- iii. Be paid to the Agency by way of grants or donations, and
- iv. Vest in or accrue to the Agency.

The Agency may:

- i. Accept moneys by way of grants or donations from any source in Zambia and subject to the approval of the Minister, from any source outside Zambia,
- ii. Subject to the approval by the Minister, raise by way of loans or otherwise, such moneys as it may require for the discharge of its functions, and
- iii. In accordance with the regulations under the Act, charge fees for the services provided by the Agency.

## **7. Funding**

In the Estimates of Revenue and Expenditure for the years ended 31<sup>st</sup> December 2012, 2013, 2014 and 2015 authorised provisions totalling K19,129,260,577 were made to cater

for the roads under the RDA against which amounts totalling K17,516,847,343 were received representing 92 percent funding as shown in the table below.

<b>Year</b>	<b>Budget K</b>	<b>Released K</b>	<b>Over/(Under) K</b>
2012	4,272,198,387	1,764,853,766	(2,507,344,621)
2013	3,288,928,382	4,192,161,302	903,232,920
2014	4,943,195,034	5,241,393,353	298,198,319
2015	6,624,938,774	6,318,438,922	(306,499,852)
<b>Total</b>	<b>19,129,260,577</b>	<b>17,516,847,343</b>	<b>(1,612,413,234)</b>

## **8. Weaknesses in Procurement and Management of Road Contracts**

### **a. Over Procurement of Projects**

A comparison of the approved annual budget and the unconstrained budget for the period under review revealed that although the Agency received actual funds equivalent to 92 percent of the annual work plan budget, the budget was significantly small compared to the unconstrained budget. For example in 2015, the unconstrained budget was K10,956,976,000 while the approved budget was K6,624,938,774. The actual funding was K6,318,438,922 which was 95 percent of the approved budget, but only 58 percent of the unconstrained budget. It was however observed that roads were procured at unconstrained levels thereby resulting in cash flow problems which in turn resulted in interest and standing time claims.

### **b. Late Engagement of Supervising Consultants**

During the period under review, thirty two (32) contractors with a contract sum of K11,675,882,234 were engaged and commenced work prior to the engagement of supervising consultants. In some cases, supervising consultants were engaged as late as twenty two (22) months after the commencement of works. In this respect, contractors executed works without supervision.

### **c. Non Availability of Detailed Engineering Road Designs**

Standard Engineering practice requires that detailed engineering road designs which include pavement and geometric designs, environmental management, drawings and estimated construction costs are put in place before tendering and construction. The purpose of designs is to comprehensively identify the scope and cost of the project and eliminate inappropriateness, inefficiency, error, omission, fault or other defects during implementation and in use. The designs are also a major input in the tendering process.



In order for the contractors to be able to execute works correctly, RDA is required to provide them with detailed engineering road designs.

However, contrary to this requirement, twenty nine (29) projects with initial contract sums of K8,011,422,391 were procured and commenced without detailed designs.

The absence of detailed road engineering designs led to preparation of inaccurate BoQs which in turn led to variations in the contracts, re-scoping of works and extension of time thereby delaying the completion of projects.

**d. Delayed Commencement of Works**

Contrary to the contracts which required that contractors commence works within fourteen (14) days after signing the contracts, there were twelve (12) projects which did not commence for periods ranging from one (1) month to twelve (12) months.

**e. Failure to Pay Contractors on Time**

Once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) to fifty six (56) days failure to which the contractor is entitled to charge interest on the outstanding claim.

An amount of K3,572,567,083 relating to a sample of fifty two (52) projects had been certified out of which K2,262,026,893 had been paid leaving a balance of K1,777,790,549 outstanding for periods ranging from 28 to more than 400 days resulting in contractors and consultants charging interest amounting to K141,590,074 as of December 2016.

**f. Single Sourcing of Subcontractors**

The RDA Modalities and Guidelines on 20 percent Subcontracting states "It is Government Policy that a minimum of 20 percent of the works on all road contracts awarded by the Agency would be executed by Zambian-owned companies in line with the shareholding structure specified in the Citizens Economic Empowerment Act No. 9 of 2006 whose overall goal is to contribute to sustainable economic development, by building capacity in Zambian-owned companies."

The 20 percent subcontracting policy is only applicable to all road contracts exceeding K30 million."

There was no evidence that the selection and recommendation for award of tenders to subcontractors on all the contracts followed a competitive and transparent process.

**g. Variations**

Guidance from the Attorney General provided that as per best practice all variations shall not exceed 25 percent of the contractual price. However, there were excessive variations on certain contracts ranging from 50 percent to 400 percent.

**h. Change of Key Personnel without RDA Approval**

Although the contracts provided for the contractors not to change key personnel without approval from RDA, it was observed that on nine (9) projects, contractors changed key personnel without approval from RDA. There were no punitive measures provided in the contracts for the breach of this requirement.

**i. Poor Workmanship – non adherence to Project Specification**

Samples of base course thickness did not meet the minimum specifications on selected roads. There were crumbled cores which were as a result of inadequate cement, poor selection of materials and inadequate compaction. The surfacing on some sections of the roads were found to be peeling off. Drainage on selected roads in Lusaka were characterized by incomplete and abandoned works. Some road signs did not meet the required specification of retro-reflectivity. Surface irregularities were also observed on most roads with seals. However, despite the contractors not meeting specifications, all payments were made as per specifications in the contract resulting in overpayments, wasteful expenditure and lack of value for money. For example, a road base specified at 150 mm and contractor constructs at 100 mm but claims and is paid for 150 mm.

**j. Award of Contract for Detailed Engineering Road Designs to the Contractor**

In certain cases, the contractors constructing roads were also engaged to do the detailed engineering road designs for the same roads.

## **LUSAKA PROVINCE**

### **9. Construction of a Fixed Electronic Weighbridge Station in Chongwe**

On 12<sup>th</sup> January 2015, RDA engaged Nelkan Industrial Construction Limited to construct a fixed electronic weighbridge station in Chongwe District at a contract sum of K16,337,121 VAT inclusive with a completion period of seven (7) months. The contract's commencement date was 30<sup>th</sup> January 2015 with a completion date of 29<sup>th</sup> August 2015. The contract sum was revised to K18,686,346 through variation order No.1 and the completion date revised to 29<sup>th</sup> December 2015.

The RDA also signed a supervision contract on 4<sup>th</sup> April 2011 with Zulu Development Consultants Limited at a contract sum of K484,012 which was revised upwards to K1,306,573 and the completion date was revised to December 2015.

This was a World Bank funded project whose continued support depended in part on implementation according to schedule.

The scope of works included:

- i. Construction of driveways and parking areas.
- ii. Construction of Weighbridge house, weighbridge pit, offices, side & mitre drains and passing lanes.
- iii. Installation of road signs and road line making, weighbridge platform and other equipment.
- iv. Sinking of borehole and associated pipe works.

The following were observed:

#### **a. Questionable Award of Contract**

Although the contract was awarded to Nelkan Industrial Construction Limited, the award was questionable as Nelkan Industrial Construction Limited failed the evaluation at the preliminary stage because he amended the Bid Form to exclude any adjudicator on the contract and this was considered a major deviation and was contrary to the Public Procurement Act.

**b. Termination of Contract**

On 14<sup>th</sup> December 2015, the contract was terminated because the contractor failed to meet the requirements of clause 59.2 (f) of the signed contract due to the following reasons:

- Slow pace of work due to improper planning in execution.
- Failure to have critical construction equipment such as the excavator, grader, water bowser and roller. This equipment had been withdrawn from the contractor because he had failed to pay the supplier of the equipment.
- Non-renewal of the insurance bond, performance security and advance payment guarantee which had expired on 18<sup>th</sup> October 2015, 29<sup>th</sup> January 2016 and 20<sup>th</sup> October 2015 respectively.
- Gross incompetence from the contractor as communicated by the Consultant in a letter dated 5<sup>th</sup> November 2015. The letter cited replacement of the Surveyor and Site Engineer with staff whose qualifications were unknown.

**c. Failure to Access World Bank Funding**

The construction of the Chongwe Weighbridge was a World Bank funded project. The Government had entered into a loan agreement with the World Bank to access funds for the construction of a weighbridge in Chongwe. This agreement expired in April 2016 and RDA lost the funding because of the contractor's failure to complete the works within the contractual seven (7) months.

**d. Unrecovered Advance Payment**

A scrutiny of project records revealed that a total of K3,267,424 was paid as advance payment to the contractor. Out of this K2,123,826 was recovered, while the balance of K1,143,500 had not been recovered as of December 2016.

**10. Periodic Maintenance of 51 km of D162 (Linda – Kafue Estate Road) Including U8 (Chanyanya Road) in Lusaka Province**

On 28<sup>th</sup> January 2015, RDA engaged Achuka Investments Limited to undertake periodic maintenance of 51 km of D162 (Linda – Kafue Estate Road) including U8 (Chanyanya Road) in Lusaka Province at a contract sum of K24,795,813 VAT inclusive with a

completion period of twenty four (24) months and a commencement date of 11<sup>th</sup> February 2015.

The scope of works included among other things; construction of a 5.5 m wide carriageway with 150 mm gravel surfacing, 200 mm natural gravel layer compacted to 93 percent of modified AASHTO density. Borrow material with minimum CBR of 15 at 93 percent of modified AASHTO density.

The consultant for the project was the RDA, Lusaka Regional Office.

As of December 2016, the contractor had been paid amounts totalling K4,821,948.

The following were observed:

**a. Delayed Commencement of Works due to Failure to Pay Advance Payment**

According to GCC 1.1(dd) of the contract, the start date shall be 14 days from the date of signing of the contract. Since the contract was signed on 28<sup>th</sup> January 2015, the start date should have been 10<sup>th</sup> February 2015. However, a review of documents such as IPCs and progress reports revealed that the actual start date of the contract was 28<sup>th</sup> February 2015 instead of 10<sup>th</sup> February 2015.

Further, in a correspondence dated 21<sup>st</sup> September 2015 to the CEO – RDA, the Regional manager for Lusaka Region requested for an extension of time citing late advance payment. In this minute, the Regional Manager reminded the CEO that the 12 months contract commenced on 28<sup>th</sup> February 2015 but the contractor only received the Advance payment five (5) months later in July 2015 and that only then did the contractor begin to register some physical progress on the project. The contractor therefore requested for four (4) months extension and addendum No.1 extending the completion date to 27<sup>th</sup> June 2016 was signed on 11<sup>th</sup> January 2016.

**b. Delayed Settlement of IPCs**

Clause 43.1 of the conditions of the contract provides that “the client shall pay the contractor the amounts certified by the project manager within fifty six (56) days of the date of each certificate. If the client makes a late payment, the contractor shall be paid interest on the late payment in the next payment.”

As of December 2016, the RDA owed the contractor amounts totalling K2,524,620 in respect of three (3) unpaid IPCs.

## 11. Construction of Drainage Structures on Selected Roads in Lusaka Urban

On 7<sup>th</sup> March 2014, RDA engaged twelve (12) contractors, shown in the table below, to construct drainage structures on selected roads in Lusaka urban at a total cost of K9,254,915. The projects were for a duration of four (4) months and were being supervised by the RDA.

Project	Contractor	Contract Sum K
Lot 7 A - Caltex to Kalimba Farm Road (drainage stone pitching - 800 m)	Luja Enterprises Limited	986,603
Lot 7 A1 - Kalingalinga and Kareeboom Roads	Kaungu General Dealers Limited	557,433
Lot 7 A2 - Kaunda Square 1 to Church Road and Kaunda Square 2 (Roads 1 and 2)	Parnet Mining Limited	869,435
Lot 7 A3 - Mother Theresa to PHI Link Road, Mtendere East School Road and Munali to Mutumbi Road	BG Saka Logistics Limited	1,107,470
Lot 7 A4 - Ngwerere Chelston Road and Stalilo Shopping Centre	Fun Build Services	716,898
Lot 8 A5 - Mandevu Road and Chazanga SOS Road	Lisemuk General Dealers	639,914
Lot 8A6	Geomachi	449,336
Lot 8 A7 - Mwansabombwe, Ngwerere and Mutoke Roads	Magwedi Suppliers	725,967
Lot 8 B8 - Mberere and Mapepe Roads	Bimmtech Contractors Ltd	712,582
Lot 8 B9 - Katimamulilo, Kabila and Broads Roads	Connell Enterprises Limited	873,300
Lot 8 B10 - Along Garden Sewerage and Chudleigh Roads	A Plus Creative Works Limited	879,802
Lot 8 B11 - Chipata 1 and 2 Roads	Kapomu General Dealers	736,175
<b>Total</b>		<b>9,254,915</b>

The following were observed:

### a. Irregular Approval of Variation of Works

According to Clause 58 (1) and 58 (3) of Public Procurement Act of 2008, all amendments to a contract shall require prior authorisation of the appropriate approvals authority and the Attorney General. Any amendments to the contracts purportedly effected without the approval of the Attorney General shall be void. However, there were variations in amounts totalling K3,685,522 in respect of

eleven (11) contracts that were irregular in that the variations were done without the approval from the Attorney General. See table below.

<b>Contractor</b>	<b>Lot No.</b>	<b>Initial Contract Sum K</b>	<b>Revised Contract Sum K</b>	<b>Variation K</b>
Luja Enterprise	7A	986,603	1,030,428	43,825
Kaungu General Dealers	7A1	557,433	736,785	179,352
Parnet Mining Limited	7A2	869,435	898,020	28,585
BG Saka Logistics	7A3	1,107,470	1,995,995	888,525
Fun Build Services limited	7A4	716,898	990,214	273,315
Lisemuk General Dealers	8A5	639,914	724,066	84,152
Geomachi	8A6	449,336	1,035,734	586,398
Bimmtech	8B8	712,582	879,325	166,742
Connell Enterprise	8B9	873,300	1,523,602	650,303
A Plus Creative Works	8B10	879,802	1,388,155	508,353
Kapoma General Dealers	8B11	736,175	1,012,148	275,973
<b>Total</b>		<b>8,528,948</b>	<b>12,214,470</b>	<b>3,685,522</b>

**b. Irregular Payment of Uncertified Works**

The RDA irregularly paid amounts totalling K480,627 (BG Saka Logistics Limited (Lot 7 A3) - K264,269 and Fun Build Services (Lot 7 A4) - K216,358) for works that were not certified.

Further, A Plus Creative Works Limited (Lot 8 B10) was overpaid by K44,194 despite the contractor not fully executing their contract. As of November 2016, the overpayment had not been recovered from the contractor.

**c. Failure to Recover Advance in Full**

RDA paid Parnet Mining Limited (Lot 7 A2) an advance payment of K80,800 which was to be recovered from the contractor during the duration of the contract. However, as of November 2016, the advance payment had not been recovered.

**d. Award of Contract to Unregistered Contractor**

Contrary to Section 22 (1) of the National Council for Construction (NCC) Act of 2003 which requires that in order for a person to be awarded a contract for any construction works, they should be registered under the National Council for Construction, Fun Build Services was awarded a contract without being registered with the NCC.

**e. Physical Inspection – Poor Workmanship**

It was observed that there was poor workmanship on some of the projects in that some contractors;

- did not construct the drainage base (Lot 8 B8 and Lot 8 B11),



*Drainage structure on Chipata 1 road without a concrete lined base (Lot 8 B11)*



*Incomplete works with stones falling off at Chipata 1 road (Lot 8 B11)*



*Lack of access for continuous flow of water along Chipata 2 road (Lot 8 B11)*



*Drainage without a lined base along Chipata 2 road (Lot 8 B11)*

- poorly constructed slabs (Lot 8A5),





*Installed concrete slabs breaking up on drainages along Chozi Road installed concrete slabs wearing out with Y10 bars showing (Lot 8 A5)*



*Parts of concrete slabs installed along Chozi Road had broken (Lot 8 A5)*

- failed to construct access to private property consequently property owners were blocking the drainages to provide access to their properties (Lot 7 A1, Lot 7 A3, Lot 7 A4 and Lot 8 B11),



*Stalilo drainages in Kaunda square*



*Drainage with dead end as there was no provision of access to private property (Lot 8 B11)*

- improperly constructed culvert as one end of the culvert did not have an outlet at the junction of Chiyuni Mazamba and Sikwaze road (Lot 7 A1)



- did not pitch walls of the drainages (Lot 7 A4) while in some cases stones pitched to the walls had fallen off and drainage structures, shoulders and walk ways were breaking off (Lot 8 B11).



*Constructed shoulders and walk way without conforce wire breaking up along Chipata 1 road (Lot 8 B11)*



*A section of the road measuring thirty (30) metres had no stone pitch on Ngwerere road in Chelson Square pitch (Lot 7 A4)*



*Incomplete Drainage structure (Lot 7 A4) Structure stone pitched on one side(Lot 7 A4)*



*Unpitched walls of drainage (Lot 7 A4)*

- abandoned works/ incomplete drainage works (Lot 7 A3),



*Incomplete/abandoned drainage works along Mutendere road (Lot 7 A3)*

- did not complete drainage structures (Lot 8 B10) and in some cases the drainage structures were broken (Lot 7 A3).



*Incomplete Drainage Structure in Chudleigh due to Inadequate BOQ Materials (Lot 8 B10)*



*Broken Drainage structure at the Mutumbi Curve (Lot 7 A3)*



*Uncompleted works with drainage which had no direction of discharge flow (Lot 7 A3)*



## **12. Upgrading to Bituminous Standard of 98 km of the Katoba to Chirundu via Chiawa - Lot 1**

On 18<sup>th</sup> December 2014, the RDA engaged China Geo-Engineering Corporation for the upgrading to bituminous standard of approximately 98 km of the D481/D482 Road from Katoba to Chirundu via Chiawa in Lusaka Province - Lot 1 at a contract sum of K690,958,848 VAT inclusive with a completion period of thirty (30) months. The commencement date was 1<sup>st</sup> January 2015.

The scope of works included the following:

- i. Heavy grading for new road bed formation,
- ii. Bridge /culvert construction,
- iii. Major earth works, for cuts and fills, and rock blasting, and
- iv. Laying bitumen.

As of December 2016, the contractor had been paid amounts totalling K149,902,414.

On 6<sup>th</sup> February 2015, RDA engaged ILISO Consulting to provide consultancy services for the design preparation which was later amended to include supervision at a contract price of K18,767,948. As of December 2016, the consultant had been paid amounts totalling K2,443,406.

The following were observed:

### **a. Late Engagement of the Supervising Consultant**

The supervising consultant was engaged on 6<sup>th</sup> February 2015 while the works commenced on 1<sup>st</sup> January 2015 resulting in a delay of one month. Consequently, RDA did not provide the contractor with detailed road engineering designs at the commencement of works, contrary to Standard Engineering Practice.

### **b. Questionable Award of Works Contract**

Contrary to Section 32(2) of the Public Procurement Act, the RDA entered into a works contract with China Geo-Engineering Corporation using direct bidding method.

The Act states that a procuring entity may use direct bidding, where;

- i. The goods, works or non-consulting services are only available from a single source and no reasonable alternative or substitute exists,
- ii. Due to an emergency, there is urgent need for the goods, works or services making it impractical to use other methods of procurement because of the time involved in using those methods,
- iii. Additional goods, works or services must be procured from the same source because of the need for compatibility, standardization or continuity,
- iv. An existing contract could be extended for additional goods, works or services for a similar nature and no advantage could be obtained by further competition, or
- v. The estimated value of the goods, works or services does not exceed the prescribed threshold.

In the letter of no objection written to RDA dated 19<sup>th</sup> November 2013, the ZPPA stated that, “China Geo Engineering Corporation was contracted for the 55 km Leopards Hill road to Katoba through direct bidding. Therefore, it cannot be established that “no advantage” would be gained from competition as there are several qualified contractors on the open market to undertake works of this magnitude; and although the contractor has agreed to maintain the rates on the earlier contract, in the absence of a competitive method of procurement, there is no basis to ascertain whether the rates are indeed fair.”

In this regard, China Geo-Engineering Corporation was given undue advantage as there were several qualified contractors on the open market to undertake the works of this magnitude. In addition, the decision by ZPPA to grant a no objection was also questionable in that they clearly outlined the disadvantages and implications but proceeded to grant no objection.

**c. Failure to Pay Consultant and Contractor on Time.**

According to the contract, once a contractor’s claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

As of December 2016, the RDA owed the contractor amounts totalling K150,234,352 in respect of ten (10) unpaid IPCs.

In addition, there were nineteen (19) unpaid fee notes for the consultant in amounts totalling K4,990,368 some of which had been outstanding for more than 300 days.

Consequently, on 20<sup>th</sup> February 2016, the contractor suspended project works due to delayed payments of certified interim payment certificates.

### **13. Periodic Maintenance of 10 km of T004 Great East Road from Arcades to Airport Roundabout**

On 5<sup>th</sup> February 2014, RDA engaged Stefanutti Stocks Construction Zambia to rehabilitate approximately 10 km of T1004 Great East Road from Arcades Roundabout to Airport Junction in Lusaka and remedying of any defects therein at a contract sum of K65,365,865 VAT inclusive with a completion period of seven (7) months. The contract sum was revised to K189,745,103 with a revised completion date of 16<sup>th</sup> December 2015.

As of December 2016, the contractor had been paid amounts totalling K57,715,859.

Further, on 8<sup>th</sup> January 2014, RDA awarded a contract to East Consult Limited in association with Knight Piesold as Consultant/Project manager to undertake the design review and supervisory services at a contract sum of K12,959,520 and a completion period of seven (7) months. The contract duration was extended bringing the completion date to 8<sup>th</sup> February 2016.

Site possession and works commenced on 19<sup>th</sup> February 2014.

The scope of works included:

- excavation, grading and other earth works, road paving and surface sealing,
- reinforced concrete works, drainage works, signage, clearing and grubbing, earthworks and gravel and bitumen stabilized material pavement layers, drainage works and
- (re)–surfacing of the carriage with AE2 modified binder asphalt, new concrete lining of side drains, construction of kerbs, construction of paved sidewalks; and
- installation of road signs and road markings, milling of existing asphalt layer for a distance of 7.5 km and re –surface with 50mm asphalt AE2 base and reconstruction

of approximately 2.5 km section between Chelston water towers and Airport turnoff and slip lanes at certain entry points into existing commercial and social buildings.

The following were observed:

**a. Lack of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor as of May 2015.

**b. Increase in Price for Consultancy Services after Variation Order**

On 11<sup>th</sup> September 2014, RDA procurement committee granted authority to vary the contract for Consulting Services for design review and supervision works by increasing the contract duration by eight (8) months and design phase duration to four (4) months, thus increasing the total contract duration to sixteen months. The variation resulted in an increase of the contract price to K9,114,120 VAT inclusive from the original contract price of K2,273,832 representing an increase of K6,840,288 representing 300 percent of the initial contract price.

**c. Failure to Pay the Contractor and the Consultant On Time**

According to the contract, once a consultant/contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

As of December 2016, the RDA owed the contractor amounts totalling K35,580,139 in respect of five (5) unpaid IPCs.

Consequently, the contractor claimed interest of K13,818,825 and standing time in amounts totalling K5,158,220.

In addition, out of fee notes in amounts totalling K11,455,982 claimed by the consultant, the RDA paid K3,771,788 while the balance of K6,163,751 for three (3) fee notes had not been paid as of December 2016.

**14. Design and Construction/Upgrading of Multi Facility Economic Zone (MFEZ) 2.4 km Chifwema Road Main Access and 50km various Internal roads in Lusaka City**

On 8<sup>th</sup> May 2009, RDA engaged China Jiangxi Corporation for International Economic and Technical Cooperation in Association with Bicon Zambia Limited for the Design and

Construction/Upgrading of Multi Facility Economic Zone (MFEZ) 2.4 km Chifwema Road Main Access and 50 km various internal roads in Lusaka City at a contract sum of K47,562,388 with a completion period of fourteen (14) months. The contract start date was 22<sup>nd</sup> February 2010.

The initial scope of works included upgrading approximately 2.4 km of the Chifwema road access to LS-MFEZ to bituminous standard, the internal network of 50 km were to be constructed to gravel standard only in the first phase.

The scope for internal road network of 50 km was later changed to meet the requirements of the master plan to bituminous standard. Therefore a total of 11.4 km (ie. Chifwema 2.4 km and 9.0 km internal roads) were to be surfaced from the contract sum of K47,562,388.

On 1<sup>st</sup> December 2012, RDA granted authority to variation order No. 2 to vary works on the contract by increasing the scope of works to include an additional 5 km and incur additional expenditure of K23,417,188 VAT inclusive thus bringing the contract sum to K70,978,480 VAT Inclusive with an extended period of eight (8) months from 30<sup>th</sup> November 2012 to 31<sup>st</sup> July 2013.

Further, on 4<sup>th</sup> October 2013, RDA granted variation order No. 3 to the contractor for additional works of 2.3 km at an additional cost of K12,860,974 to ensure connectivity to the Lusaka ring road and extended the contract duration by thirteen (13) months increasing the contract sum to K83,839,454 with a completion date of 31<sup>st</sup> January 2014.

As of April 2014, a total of K83,776,427 had been paid to the Contractor.

The contractor handed over the road on 19<sup>th</sup> May 2014 and the defect liability period expired in March 2015.

The following were observed:

**a. Surface Irregularity - Road No. 1**

A physical inspection conducted in March 2015 on the 50 km internal roads within MFEZ, to check on the construction tolerances and finish requirements using the 3m Straight Edge on the surface irregularity/rutting revealed that contrary to clause 4212, construction tolerances and finish requirements in SATCC specification which allows a maximum of 10 mm, a distance of 312 m at the MFEZ entrance connected to the ring road had an average cross section surface irregularity of 34mm



when measured under a 3m Straight Edge which was an indication that the road base had failed.



*Surface Irregularity at 34mm on the average cross section on road No. 1 in MFEZ area*

**b. Failure to Undertake Outstanding Works within the Defect Liability Period**

A physical inspection conducted in March 2015 to follow up defects which were confirmed by the contractor and were supposed to be worked on during the defect liability period revealed the following:

**i. Failure to Reinstate Borrow Pit**

Contrary to the requirements of the contract conditions under clause C10103 – SATCC reinstatement of the site, it was observed that borrow pits for both gravel and aggregate stones were un-reinstated as of March 2015.

Further, the snag list highlighted among other things “All areas which had been employed as Borrow Areas were to be reinstated by dumping approved gravel and spread back the over burden to encourage regeneration of vegetation and eliminate stagnation of storm water”.

However, despite breaching of this condition, RDA granted BICON/CHINA JIANGXI the substantial completion certificate in 2014 with a borrow pit and quarry not reinstated. See pictures below.



*Unburied quarry for stone aggregate*



*Unburied borrow pit for gravel*

**ii. Failure to Construct Bell Mouths**

It was observed that the five (5) bell mouths which were reported in the 2012/2013 snag list had not been surfaced as of October 2016. See picture below.



*Bell mouths not surfaced at the road edge within MFEZs*

**c. Poor Construction Joints**

There were poor construction joints on road No. 3 on approximately 1 km from the junction of road No.1 and eighteen (18) poor construction joints on road No.1 causing the points where the joints are to be bumpy.

**d. Poor Workmanship**

On road No.1, there were depressions, poor riding surface resulting in uneven surface covering a distance of 5.3 km, and poor surfacing of asphalt on a number of portions.

**e. Failure to Maintain Project Motor Vehicles**

Clause B1405 of the contract document states among other things that motor vehicles shall be handed over to the RDA at the end of the contract and that they shall be insured comprehensively and be in good working condition.

Contrary to the clause, a physical inspection conducted revealed that two (2) out of the three (3) motor vehicles which were procured for this road project had not been running for a period of over twelve (12) months. It was also observed that insurance for one vehicle had expired in August 2012, the other vehicle in July 2014 and the

third in January 2015. As of December 2016, insurance on these motor vehicles had not been renewed and the vehicles had not been handed over to RDA.

**15. Upgrading to Bituminous Standard of D153 from Great East Road at Moono Police Check Point via Palabana to Chilyabale Basic School (54 km)**

On 26<sup>th</sup> November 2013, the RDA engaged Chetek Zambia Limited for the Upgrading to Bituminous Standard of D153 from Great East Road at Moono Police Check Point via Palabana to D151 at Chilyabale Basic School (54 km) in Lusaka Province at a contract sum of K221,212,397 VAT Inclusive with a completion period of eighteen months (18) months. The contract commencement date was 5<sup>th</sup> March 2014 with an initial completion date of 7<sup>th</sup> September 2015. The contract price was revised to K283,453,015 and the revised completion date is 7<sup>th</sup> March 2017.

The scope of work included among other things, bush clearing, excavation and earth works, construction of road formation, crushed stone base course, natural gravel sub-base and construction double surface dressing, construction of concrete lined open drains, removal of existing pipe culverts and demolishing inlet and outlet structures, construction of concrete kerbs, stone pitching and protection of culverts against erosion, construction of box/rectangular culverts

As of December 2016, a total of K67,881,927 had been paid to be contractor and estimated physical work progress was at 29.03 percent.

The following were observed:

**a. Failure to Sign a Contract with the Consultant**

The RDA engaged Bicon Zambia Limited to review and update engineering design, contract document and construction supervision services for the upgrading to bituminous standard of D153 Great East Road at Moono Police Check Point via Palabana to Chilyabale Basic School (54 km) road.

However, there was no contract signed between RDA and Bicon Zambia Limited for these services as of December 2016. In the absence of the contract, the basis upon which Bicon Zambia Limited was rendering these services on behalf of RDA was questionable.

**b. Failure to Pay Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

As of December 2016, RDA owed the contractor amounts totalling K36,441,828 in respect of eleven (11) unpaid Interim Payment Certificates (IPCs). Consequently, the contractor claimed interest amounting to K5,000,000 on unpaid IPCs.

**16. Upgrading of Approximately 8 km of Mutumbi to Zambezi Road**

On 13<sup>th</sup> March 2014, RDA engaged Scirocco Enterprises Limited to undertake the execution of works for the upgrading to bituminous standard of approximately 8 km of Mutumbi Cemetery to Zambezi Road in Lusaka Province and remedying of any defects therein at the contract sum of K41,999,823 VAT inclusive with a completion period of eight (8) months.

Works commenced on 13<sup>th</sup> April 2014 and the completion date changed to 6<sup>th</sup> October 2015 after the approval of variation order No. 1 where the scope of works changed and contract duration was extended.

The initial scope of works included:

- Lined side drainages,
- Culvert structures,
- Widening of the existing road carriageway and shoulders,
- Construction of new pavement layers and asphalt concrete wearing course,
- Bush clearing, earth works, and
- Construction of road formation and subgrade.

As of December 2016, the contractor had been paid amounts totalling K32,225,549. In addition, RDA owed the contractor K466,547 in respect of one IPC.

As of April 2016, overall progress for the project was 87 percent.

The following were observed:

**a. Late Engagement of the Supervising Consultant**

The supervising consultant was engaged in June 2014 while the works contract commenced on 13<sup>th</sup> March 2014 resulting in a delay of three (3) months.

**b. Lack of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor as of July 2014. In addition, the final designs had not been approved as of December 2016.

**c. Irregular Engagement of the Contractor**

A scrutiny of the tender evaluation document revealed that the award of the contract to Scirocco Enterprise was irregular in that the contractor failed to meet the key requirements in the award of the contract at the post qualification evaluation stage.

Although the tender evaluation committee considered the failure by Scirocco Enterprise to attach the EIZ/ERB certificate for the position of laboratory supervisor to be minor deviation, it was irregular in that it was one of the key requirements at the bidding stage and was one of the major determining factors on the contractor's capability to undertake works.

**d. Failure to Renew Works and Consultancy Contracts**

Although the contractor continued to undertake contractual works on this project, the works were irregular in that the contract had expired. Management did not avail for audit any correspondence regarding the contractor requesting for authority to extend the contract duration, approval from the Attorney General's office to extend the contract duration, addendum to confirm formalization of works and RDA's communication to the contractor over the extension of time.

A scrutiny of Progress Report No. 22 for March 2016 revealed that the contract had expired on 6<sup>th</sup> January 2016 and the contractor issued a notice for contract termination on 11<sup>th</sup> January 2016 and later demobilised. However, although the contractor re-mobilised on site and commenced works on 23<sup>rd</sup> February 2016, the contract had not been renewed.

It was also stated in the same report that the consultant had requested for an extension of time from 20<sup>th</sup> December 2015 to April 2016 to facilitate the completion of the contract but had not received a response as of December 2016.

**e. Physical Inspection**

A physical inspection carried out on the road revealed the following:

**i. Trial Pit Tests**

Out of the five (5) base thicknesses taken, two (2) readings as shown below were out of the allowed tolerance of 27 mm (minimum 123 mm).

- At Km 0+000, the maximum base thickness measured was 105 mm on RHS shoulder; required base thickness is 150 mm.
- At Km 0+104, the maximum base thickness measured was 100 mm on LHS shoulder; required base thickness is 150 mm.

See picture below.



*Measurement of the base*

**ii. Schmidt Hammer Test for Concrete**

- 35 m section of walkway was rejected as it was of poor quality, and
- The walkway has bad aesthetics and no expansion joints. See picture on the next page.



*The walkway with bad aesthetics and no expansion joints*

#### **17. Rehabilitation of T2 – Lusaka to Chirundu Road – Link 3 KM 55+200 to km 73+100**

On 17<sup>th</sup> July 2012, RDA engaged China Henan International Cooperation to rehabilitate the Lusaka to Chirundu Road (Link 3 Km 55+200 to Km 73+100) at a contract sum of K54,369,818 with a completion period of twenty four (24) months. The contract was varied three (3) times resulting in a revised contract sum of K82,067,048.

The scope of works included the following:

- Widening of the road prism to accommodate the new road profile,
- Realignment of short sections in the horizontal and vertical plans,
- Construction of pavement layers on widened portion and reconstruction of existing pavement layers,
- Construction of a cement stabilised subbase layers, 200 mm in Section 3a and 3b-2,
- Construction of a 50 mm final surfacing using asphaltic concrete, and
- Double surface dressing to shoulders.

The works commenced on 29<sup>th</sup> August 2011 with a revised completion date of 27<sup>th</sup> November 2015. As of December 2016, the contractor had completed the works and was paid in full.

A physical inspection of the project revealed the following:

- i. At Km 55+000 LHS, crushed stone base, the average base thickness measured was 121 mm,

- ii. At Km 60+000 RHS, crushed stone base, the average base thickness measured was 122 mm,
- iii. At Km 65+200 LHS, crushed stone base, the average base thickness measured was 120 mm, and
- iv. At Km 70+200 LHS, crushed stone base, the average base thickness measured was 143 mm.

Only one out of the five (5) measurements met the minimum thickness of 123 mm as per SATCC clauses.

**18. Contract for the upgrading to Bituminous Standard of RD 149 and D151 from Great East Road at Chongwe District Hospital to Katoba Basic School (48.5) including D150 from Great East Road at CC Farms to RD 149 (12.5km) road – Lot 1 in Lusaka Province**

On 5<sup>th</sup> April 2013, RDA engaged Zhogmei Engineering Group Ltd to upgrade to bituminous standard of RD 149 and D151 from Great East Road at Chongwe District Hospital to Katoba Basic School (48.5) including D150 from Great East Road at CC Farms to RD 149 (12.5 km) road – Lot 1 in Lusaka province at a contract sum of K205,807,776 VAT inclusive with a completion period of twenty four (24) months commencing on 22<sup>nd</sup> April 2013 and expected completion date of 21<sup>st</sup> April 2015.

The scope of works included bush clearing, earth works, construction of road formation, sub grade and construction of pavement layers with asphalt surface on the carriage and shoulders.

As of December 2016, the contractor had been paid amounts totalling K11,103,599. In addition, the RDA owed the contractor amounts totalling K6,573,701 in respect of three (3) unpaid IPCs.

The following were however observed:

**a. Lack of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor as of May 2014, eight (8) months after awarding the contract. In this regard, it was noted that the BOQ had no provisions for bridges despite the road crossing two (2) rivers. The omission of quantities in the BOQ showed a lack of planning prior to the commencement of the project.



In response, management indicated that owing to the urgency with which the Government intended to implement Link Zambia, the detailed feasibility study and detailed design could not be undertaken at the time of tendering.

**b. Commencing Consultancy Work without a Signed Contract**

Section 54 of the Public Procurement Act of 2008 states that a solicitation document shall state the procedure for award of contract, which shall be:

- i. By placement of a written contract document, or
- ii. By issue of a letter of bid acceptance, which shall be confirmed by written contract.

Contrary to the Act, Bicon Zambia Ltd commenced consultancy works without a signed contract. As of December 2016, the contract for the consultant had not been availed for audit.

**c. Physical Inspection**

During the physical inspection the following observations were made:

**i. Road Surface Irregularity**

At Km 13+900 to 14+300 LHS, the average cross section surface irregularity was 27 mm when measured under a 3 m Straight Edge contrary to the required maximum of 10 mm under Clause 4212 Construction Tolerances and Finish Requirements in SATCC specification. The length of the section with this defect was 312 m at the MFEZ entrance connected to the ring road. The Rutting indicates the road base has completely failed.



*Irregular surface*

**ii. Road Signs Retro Reflectivity**

At Km 6+600 and 0+100, signs with a white background showing curve ahead had retro reflectivity of 18.4 and 20.4 respectively at an observation angle of  $0.2^{\circ}$  contrary to the required minimum of 50.

**19. Upgrading of D753/A2 Kenneth Kaunda International Airport through Kasisi to Great East Road, D176 Ngwerere Road from T2 Great North Road at Kabangwe to D 753 at Kasisi Mission Junction including D564 from T4 at Caltex to D176 at Ngwerere Basic School and Zambezi Extension from Roma Park to Ngwerere Road in Lusaka Province**

On 9<sup>th</sup> April 2013, RDA engaged Safricas Zambia to upgrade to bituminous standard of D753/A2 Kenneth Kaunda International Airport through Kasisi to Great East Road, D176 Ngwerere Road from T2 Great North Road at Kabangwe to D 753 at Kasisi Mission Junction including D564 from T4 at Caltex to D176 at Ngwerere Basic school and Zambezi Extension from Roma Park to Ngwerere Road in Lusaka Province at an initial contract sum of K168,786,868 VAT inclusive. The contract price was revised to K223,852,936 VAT inclusive with a duration of eighteen (18) months commencing on 28<sup>th</sup> May 2013 and expected completion date of 27<sup>th</sup> November 2014. The duration was revised to forty (40) months with the revised completion date of 27<sup>th</sup> September 2016.

The scope of works included bush clearing, earth works, construction of road formation, sub grade and construction of pavement layers with asphalt surface on the carriage and shoulders.

As of December 2016, the contractor had been paid amounts totalling K153,867,128.

The following were however observed:

**a. Lack of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor as of May 2014 eight (8) months after awarding the contract.

**b. Questionable Certification and Payments for Works**

RDA paid the contractor amounts totalling K153,867,128 out of the total certified claims of K208,241,515.

However, the payments were questionable in that although the contractor had only completed 16 km (21.3 percent) of the road, the total certified claims of K208,241,515 represented 73.5 percent of the contract price. In this regard, the supervising consultant's action to certify the contractor's claims was questionable.

As of October 2016, the contract had expired and the contractor was not carrying out any works.

**c. Lack of Consultancy Contract**

Section 54 of the Public Procurement Act of 2008 states that a solicitation document shall state the procedure for award of contract which shall be:

- i. By placement of a written contract document; or
- ii. By issue of a letter of bid acceptance, which shall be confirmed by written contract.

A review of correspondence in January 2015 revealed that the consultant on the road was Bicon Zambia Ltd. However, it was observed that the consultant was working without a contract. As of December 2016, the contract for the consultant had not been availed for audit.

**d. Physical Inspection**

During a physical inspection, the following observations were made:

**i. Road Signs Retro Reflectivity**

At Km 6+600 and 0+100, signs with a white background showing curve ahead had retroreflection of 18.4 and 20.4 respectively at an observation angle of 0.2° contrary to the required minimum of 50.

**ii. Visual Inspection**

There were visible cracks on the Road at Km 0+500 and no sealing of the crack had been undertaken as per SATCC clause 4907 although the cracks could have been visible during handover.

There were visible poorly constructed longitudinal joint at Km 0+500. This was in contrast to SATCC clause 4208 which states that Joints shall be neat and shall have the same texture as the remainder of asphalt.

There was poor workmanship in the construction of the road resulting in bleeding from Km 3+800 for about 10 km.

There were crushed stone base surface irregularities due to ravelling in that the stone base had not been protected contrary to SATCC clause 3404. See picture below.



*Worn out crushed stone base not protected with quarry dust from weather elements and traffic*

**20. Upgrading to Bituminous Standards and Realignment of the Approximately 91 km of D145 Road from Great East Road at (T004) at Luangwa Bridge to Luangwa (Feira) in Lusaka Province – Lot 4**

On 30<sup>th</sup> January 2013, RDA engaged China Geo Engineering Corporation to upgrade to bituminous standard and re-align approximately 91 km of the D145 Road from Great East road at (T004) at Luangwa Bridge to Luangwa (Feira) in Lusaka Province – Lot 4 at a contract sum of K314,958,672 with a completion period of twenty four (24) months ending 12<sup>th</sup> February 2015.

As of December 2016, the contractor had been paid amounts totalling K142,024,565.

Further, on 3<sup>rd</sup> April 2013, Bicon Zambia Limited in Association with Grontmij Carl Bro was engaged to provide consultancy services for the design review and supervision of the project at a contract sum of K12,799,792 with a completion period of twenty four (24) months.

The following was observed:

**a. Failure to Pay Contractor on Time**

According to the Contract, once a contractor's claim for payment is certified by the supervising consultant, the claim is supposed to be settled within twenty eight (28)

days failure to which the contractor is entitled to charge interest on the outstanding claim.

As of December 2016, the RDA owed the contractor amounts totalling K61,069,797.

**b. Irregularities in the Implementation of the Contract**

A review of the March 2015 progress report revealed that the consultant reported that more than 99% of the works had been completed and was remaining with two (2) sections totalling 600 metres skipped for bridge works. It was observed that although the two bridges were within the 91Km stretch, quantities for their materials were completely omitted from the bill of quantities. In the final inspection report for May 2016, the consultant noted that that the bridge at km15+500 was aligned in such a way that the left lane of the surfaced road (in the direction of Luangwa) aligns with the width of the existing bridge, while the other lane is straight with the bridge handrails and inlet channel of the stream, which itself is of even greater danger to motorists. Although RDA approved a variation to the original contract and signed an addendum for the replacement of the three single lane bridges with new two-lane ones, the contractor refused to sign the addendum until RDA met the two conditions, which were:

- i. Payment of outstanding interim payment certificates, and
- ii. Introduction of price adjustment into the contract.

It was also observed that although the progress report showed that road construction works were completed, only 87.6 km of the 91 km in the contract was done, leaving 3.6 km not done.

**c. Wasteful Expenditure**

On 13<sup>th</sup> February 2013, prior to the engagement of the supervising consultant, the contractor constructed the first 2 km of the road at a cost of K9,176,934 in preparation for the Presidential launch on 29<sup>th</sup> March 2013.

However, the works were of questionable quality and the section was ripped off when the consultant was finally engaged in April 2013 rendering the expenditure wasteful.

**d. Physical Inspection of the Road**

A physical inspection revealed the following:

**i. Pavement Construction - Main Road**

- At Km 87+500 RHS, the average base thickness measured in the trial pit was 165 mm but this was a combination of the base and subbase which was supposed to be 300 mm. The drilled core crumbled.
- At Km 86+200 LHS, the average base thickness measured in the trial pit was 160 mm but this was a combination of the base and subbase which was supposed to be 300 mm. The drilled core crumbled.
- At Km 79+660 LHS, the average base thickness measured in the trial pit was 160 mm but this was a combination of the base and subbase which was supposed to be 300 mm. The drilled core crumbled.
- At Km 69+900 RHS, the drilled core retrieved measured 95 mm. The average base thickness measured in the trial pit was 200 mm but this was a combination of the base and subbase which was supposed to be 300 mm.
- At Km 60+321 RHS, the drilled core crumbled. It was difficult to measure the average base thickness in the trial pit as this section was an embankment.
- At Km 46+000 LHS, the drilled core crumbled. The average base thickness measured in the trial pit was 160 mm and subbase was 300 mm.
- At Km 35+100 RHS, the drilled core crumbled. The average base thickness measured in the trial pit was 135 mm but this was a combination of the base and subbase which was supposed to be 300mm.
- At Km 19+300 LHS, the drilled core crumbled. The average base thickness measured in the trial pit was 145 mm but this was a combination of the base and subbase which was supposed to be 300 mm.
- At Km 0+000 LHS, the drilled core crumbled.



*Crumbled core*

**ii. Surface Irregularity – 3 m Straight Edge - Surface Irregularity/  
Longitudinal Streaking**

Contrary to the requirement of maximum of 10 mm of surface irregularity under 3 m straight edge as per clause 4212 CONSTRUCTION TOLERANCES AND FINISH REQUIREMENTS in SATCC specification, it was observed that there were surface irregularities beyond the required tolerances of 10mm as detailed below.

- At Km 87+500, the average cross section surface irregularity was 16mm LHS and 23 mm RHS,
- At Km 40+000, the average cross section surface irregularity was 35mm RHS,
- At Km 35+000, the average cross section surface irregularity was 15mm RHS, and
- At Km 35+000, the average cross section surface irregularity was 13mm RHS.

**21. Contract for the Engineering Design, Rehabilitation and Construction/Upgrading of Selected Lusaka Urban Roads in Lusaka City (L400)**

On 29<sup>th</sup> August 2012, RDA engaged AVIC International Project Company Limited to design, rehabilitate, upgrade and construct approximately 402 km of selected urban and township roads in Lusaka City at a contract sum of US\$348,293,745 with a completion period of forty three (43) months.

The project was to be funded through a loan facility from the People's Republic of China to improve the road network in Lusaka City.

The scope of works included widening selected roads which have very high traffic volume, improving selected roads to and within the industrial and commercial areas, construction of bus bays along selected bus routes as part of road safety measures and improving of public transport infrastructure, re-engineering selected junctions to improve traffic flow, construction of walkways along selected roads and providing interchange solution for Kafue Roundabout.

AVIC International Project Company Limited divided the contract into four (4) lots and the following were observed:

**a. Single Sourcing and Awarding of Contract to Non-Responsive Bidder**

On 8<sup>th</sup> June 2012 and on behalf of the RDA, the Zambia Public Procurement Authority (ZPPA) invited and received one bid from the single sourced bidder, AVIC International Project Company Limited. A review of the Tender evaluation report revealed that AVIC International Project Company Limited was not only single sourced, but also found to be non-responsive because of the following two (2) reasons:

- i. The Bidder provided audited financial statements for the years 2009, 2010 and 2011. However, no opinion by an Auditor was given on the financial standing of the firm for the years 2007 and 2008 for the statements provided by the Bidder. This did not conform to the requirements of the Bidding Document that requires that audited financial statements of the Bidder are provided for the last five (5) years to demonstrate the current soundness of the bidder's financial position.
- ii. Messrs AVIC International Project Company provided only two (2) contracts undertaken within the last five (5) years that conformed to a value of at least US\$100 million. The bidder was thus declared non-responsive on the basis that they provided only two (2) contracts when they were to provide at least three (3) contracts within the last five years, each of a value at least US\$100 million.

As a result of the detailed evaluation that showed that the bid from AVIC International Project Company was non-responsive to the requirements at the



detailed evaluation stage, the bid did not qualify to proceed to the financial evaluation stage and as a result, the evaluation team recommended that the tender for the rehabilitation and upgrading of approximately 360 km of selected township and urban roads in Lusaka be annulled and re-advertised.

Despite this recommendation, the contract was awarded to AVIC International Project Company.

**b. Poor Contract Management**

According to the Public Procurement Act No. 131 (1), a procuring entity may use a lump sum contract for goods, works or services, where the content, duration and output of the contract are well defined. However, the content, duration and output of the contract including designs were not defined as the designs for the works were not in place at the time the contractor commenced the works. In this regard, there was no basis for supervising the contractor.

**c. Delay in Engagement of Consultants**

Although the contractor was engaged on 29<sup>th</sup> August 2012, there was a delay in the engagement of the consultants for periods ranging from twenty three (23) to twenty four (24) months as shown in the table below.

<b>Lot</b>	<b>Consultant</b>	<b>Date Engagement</b>	<b>Delay (Months)</b>
1	Iliso	3 <sup>rd</sup> July 2014	24
2	WCE Zambia Limited/Allione	23 <sup>rd</sup> June 2014	23
3	Henderson and Partners/YORECO	3 <sup>rd</sup> July 2014	24

**d. Certification above the Loan Amount**

Although the signed contract was for US\$348,293,475 based on the financing sourced by AVIC International, as of August 2016, a total of US\$377,956,911 had been certified resulting in an excess of US\$29,663,436 above the contract sum. There was no evidence that additional funds had been sourced.

**e. Delayed Payment of IPCs**

As of 31<sup>st</sup> August 2016, out of the certified works in amounts totalling K13,903,013 for the consultant only K5,014,275 had been paid leaving a balance of K8,888,738. The last payment was made in June 2016.

**f. Lot 1**

The roads in this lot included Burma, Chilimbulu, Mumbwa, roads in Chinika area, roads in the Industrial area and a road leading to Barlastone from Chunga covering a distance of 119 km. The Contractor and the consultant reported that the project faced a number of challenges which contributed to the delay in the execution of the project. The challenges included:

- i. Pace at which the contractor provided feedback on the road design,
- ii. Pace at which service lines were relocated by the utility companies, and
- iii. Traffic control.

A review of contract documents and a physical inspection of roads carried out in June 2015 revealed the following:

**i. Failure to Widen Bridge – Barlastone Road**

The Barlastone Road leading to Barlastone Park was upgraded to a bituminous standard two (2) lane road. However, because there were no detailed designs in place, the bridge at chainage 00+520 was not appropriately upgraded to match the road width.

**ii. Inadequate Designs**

- Sharp Curves – Barlastone Park Road: at chainage 00+700, there were junctions which were turned into curves and at some of the curves, there were contradicting signs for curving to the right and a stop sign. Some of these curves were within a 100 M of each other thereby increasing accident risks.
- Bellmouth constructed without a culvert thus blocking drainage at access points as shown in the picture below.



**g. Lot 2 – Inadequate Design**

The roads in this Lot included roads in areas around Chawama, Lilayi, Kamwala South and Libala South covering a distance of 216.3 km. The supervising consultant on Lot 2 was WCE (Z) Limited and Allione Consulting Engineers.

**i. Use of Concrete on Unstabilised Base - Lilayi Road – MA 0012**

It was observed that at chainage 4 +760 Km, the design was inadequate in that concrete was laid on unstabilised base and subbase in the shoulders. As a result, the concrete had cracks indicating failure either in the base or the concrete mixture. Further, there was no evidence that the gravel used was tested and found suitable for use as unstabilised base.

**ii. Lack of Bus Bays - Lilayi Road – MA 0012**

The road passed through a residential area serviced by commuter buses and as such, bus bays should have been included in the design. However, it was observed that there were no bus bays on this road and buses parked in the spoon drain. As a result, cracks were observed on the spoon drain because of the load of the buses.

**iii. Lack of Access Culverts - Lilayi Road – MA 0012**

It was also observed that there were no access culverts to properties. The contractor and the consultant reported that these were not in the design.

**iv. Failure to Pave Shoulders – MA002 Shaft 5**

Where the shoulder is not paved, there must be test results showing that the gravel was good enough to withstand the expected loads on that road. However, it was observed that the shoulders were not paved and were made of gravel which was not stabilized which rendered them susceptible to failure.

**h. Lot 3**

Lot 3 comprised roads in areas around Chelston, Avondale, Ibex and Kamanga. The total distance of roads in this Lot was 77 km. The supervising consultant on Lot 3 was Henderson & Partners/YORECO.

Description of Road	Road Reserve (Metres)
Trunk Road	100
Main Road	60
District Road	36
Branch Road	36
Urban Road	36
Park Road	18
Any Other Class of Roads	18

**i. Failure to Relocate Private Properties from the Road Reserve**

Section 21, subsection (2) of the Public Roads Act 2002 defines the road reserve for each class of roads. The width of the road reserve for each class of roads is the distance on either side of the road centreline.

Contrary to the requirement of the Public Roads Act, there were properties within 9 metres of the road centerline in most areas. In particular, it was observed that on the MA 033 - Kamanga – Mutumbi Road there were ZESCO poles in the drainage and private shops within the road reserves as shown in the picture below.



On Road NA 35 in Chelston, a stretch of about 245 m was not upgraded because the purported owner of the piece of land where the road was designed to go through had refused RDA to construct the Road. However, there was no evidence that RDA had verified ownership of the plot with the Lusaka City Council or the Ministry of Lands. See picture below.



On EA 008 Road at chainage Km 0 +097 the drainage was blocked because the owner stopped the contractor from placing culverts.

In response management stated that the minimum width stated above does not apply in this case, in accordance with Section 21 (3) of the Public Roads Act No 12 of 2002 which states that, “The width prescribed in subsection (2) shall not apply to any main, district, branch, urban or other road within any local authority area”. However, a scrutiny of the September 2016 progress report on Lot 2 revealed that the major problem faced on the project was relocation of houses close to the road. For instance, the consultant recommended that a house on a road SA195 must be demolished as it was too close to the road making the house unsafe for the owners. Further, the consultant reported that the house forced the contractor to reduce the width of the road from 6.7 m to 5.0 m. Similarly, the section near a house on SA036 was very close to the road making the section very dangerous to motorists and pedestrians.

**ii. Barlaston WA 19**

- At Km 0+50, there was a narrow bridge which could not allow two (2) vehicles to use the bridge at the same time which is contrary to the SATCC code for design of bridges, and
- There was no provision for a footpath on the bridge.

**iii. Chilimbulu Road**

- At Km 1+660 LHS, the cast in situ Kerbs were wrongly constructed with a height of 200mm as opposed to the required 300mm due to a new method of construction using cast in situ kerbs instead of pre-fabricated kerbs which was not approved by the Engineer. Some Kerbs seemed to have been plastered contrary to requirements of SATCC 2302 specifications,
- At Km 2+440, kerbs being constructed as reported above. The Subbase was 90mm instead of the required 200mm,
- The Sundula road / Chilimbulu road and the Burma Road /Sandulula road junctions were not improved with the slip lane from Chilimbulu

to Sandulula road. The transition (i.e. joining) from the minor road (Sandulula) to the major roads (Chilumbulu and Burma) was poor, and

- At Km 4+020, the cement stabilised sub base core crumbled. The Sub base was 45mm contrary to the requirement of 200 mm.

**iv. Mumbwa Road**

- At Km 9+300 LHS, crushed stone base measured was 110mm contrary to the required 150mm. there was surface irregularity of 10mm.
- At Km 5+250,
  - The newly constructed road had faded road markings.
  - An 11 KV electricity line needed to be relocated due to low clearance. Service ducts were required in the design to avoid cutting the road and unnecessary infringements.
  - The bollards at Livonia Mall were in the shoulder, a danger to the motorists and denying the pedestrians the rights to use the road.
- At Km 1+145, there was shoving on the newly constructed road.

**v. Nampundwe Road WA056**

- At Km 0+000, the subbase was 90mm instead of the required 200mm
- At Km 1+152, there was poor coordination with ZESCO as the service lines were relocated after the road had been constructed resulting in the contractor excavating the road and subsequent repair works were not up to the required standard.
- No bell mouths and poor transitions to access road.

**vi. MA 0012, MA 001 Kafue Road to Lilayi Police College**

- At Km 2+200, the road was constructed with concrete shoulder with 257 mess wire as reinforcement. The concrete was already failing and this was noted as an inadequate design. The shoulders were not stabilised and therefore the concrete was destined to fail as the base could not bear the weight of vehicles. The construction concrete

shoulders on unstabilised base can be considered as wasteful expenditure,

- The curve widening was required as the turning radius provided was inadequate,
- There was a poor construction joint between the concrete and the asphalt which would allow ingress (seeping) of water and lead to premature failure of the road,
- At Km 1+800, at Lilayi market is a bus station and the design did not consider the environment around resulting into a design without bus bays / bus stops forcing buses and taxies parking on the spoon drains,
- Inadequate access culverts/ slabs for properties along the road, and
- Poor road design concrete shoulder on one side without shoulder on the other side. Road not designed for pedestrians.

**vii. L400 Various Road Links**

- **Enock Kavu Road**

- The newly constructed drainage was half lined with concrete; this poses a danger of scouring at the outer edge of the concrete base. This will eventually lead to collapse of the drainage, and
- Newly constructed drainage is half lined with concrete.

- **Mtendere East Road**

- At Km 0+090 LHS, the crushed stone base thickness was 110mm contrary to required thickness of 150mm,
- At Km 0+085 RHS, the crushed stone base thickness was 105mm contrary to required thickness of 150mm,
- At Km 0+211 LHS, the crushed stone base thickness was 105mm contrary to required thickness of 150mm, and
- At Km 0+260 RHS, the crushed stone base thickness was 123mm contrary to required thickness of 150mm.

- **Kabulonga EA 088**

- At Km 0+600 RHS, crushed stone base measured was 110mm contrary to the required thickness of 150mm,
- At Km 0+560 RHS, crushed stone base was measured to be 115 mm contrary to the required thickness of 150mm, and
- At Km 0+400 RHS, crushed stone base thickness was 107 mm contrary to the required thickness of 150mm.



## **22. Upgrading to Bituminous Standard of the Leopards Hill Road (D152) from the State Lodge Junction to Katoba Basic School in Lusaka.**

On 19<sup>th</sup> September 2012, RDA engaged China Geo- Engineering Corporation for the upgrading to Bituminous Standard of the Leopards Hill Road from State lodge junction to Katoba Basic School in Lusaka at a contract sum of K242,296,469 VAT inclusive which was revised to K509,697,553 with a completion period of eighteen (18) months commencing on 9<sup>th</sup> October 2012 and expected completion date of 19<sup>th</sup> March 2014.

The scope of works included bush clearing, earth works, construction of road formation, sub grade and construction of pavement layer with asphalt surface on the carriage and shoulders.

As of December 2016, the contractor had been paid amounts totalling K342,384,913 leaving an outstanding balance of K26,689,794.

On 28<sup>th</sup> November 2012, Zulu Burrow Development Consultants Ltd was engaged to provide consultancy services for the design and construction of the works at a contract sum of K8,150,740 VAT inclusive.



The following were observed:

**a. Unjustified Direct Bidding (Single sourcing)**

Clause 32 (1) of the Public Procurement Act of 2008 states: “the objective of direct bidding shall be to achieve timely and efficient procurement where the circumstances or value do not justify or permit the use of competition”. The Act also allows direct bidding where goods and services are available from a single supplier or contractor and that such a service is urgently required.

Contrary to the provisions above, RDA single sourced the contractor to execute the works without justification.

Although Management stated that “ RDA made a request and obtained authority from ZPPA to engage China Geo through Direct Bidding (Single sourcing) on the basis that the project was urgently required to be procured for the launch of the Link Zambia 8000 Programme, and that the request for direct bidding was in accordance with section 32 (2)(b) of the Public Procurement Act of 2008”, the works did not meet this criteria for this method of procurement in that it did not qualify to the description of emergency goods, works or services quoted under clause 32(2)(b) of the Act.

**b. Excessive Variations**

During the period from September 2012 to October 2013, the contract for the upgrading to bituminous standard of the Leopards Hill Road from State Lodge Junction to Katoba Basic School in Lusaka was varied by K267,458,234 from K242,296,469 to K509,754,703 representing a variation of 110 percent. See table below.

Variation Order No.	Project/ Variation Name	Value K	Date Approved	Date Commenced	Duration	Contractor/ Subcontractor
1	NASDEC	7,357,150		27.10.12	4 Weeks	China Geo
2	UNZA Roads and Road to Nkoloma Stadium	7,626,976		22.11.12	21 days	Poseidon Green Horn, China Geo
3	Loop Road - 11.5 km	89,908,771		10.06.13	9 months	China Geo
4	Final Design (BOQ)	153,374,053	22.08.13	20.09.12	18 months	China Geo
5	Mukuyu Road, Access Road to Mikango Barracks	9,191,284	03.10.13	05.10.13	within main contract	China Geo
	Total Variations	267,458,234				
	Original Contract Price	242,296,469				
	Revised Contract Price	509,754,703				
	Percentage (%) Increase on the Original Contract Price	110				

**c. Lack of Detailed Engineering Drawings**

Standard Engineering practice requires that detailed road engineering designs which include pavement and geometric designs, environmental management, drawings and estimated construction costs are supposed to be in place before tendering and construction. In order for the contractors to be able to execute works correctly, RDA is required to provide them with detailed road engineering designs.

Further, the signed contract stated that the detailed road engineering designs would form part of the contract. However, contrary to this clause, RDA did not provide the contractor with detailed road engineering designs at the commencement of works.

It was observed that the designs/drawings were not prepared at the time of tendering of the works. As a result, the following were observed:

- The final design was approved on 22<sup>nd</sup> September 2013 one (1) year after commencement of the project. In this regard, it was not clear how the contractor executed works without approved designs or drawings.
- The final design which was approved through variation order No. 4 increased the contract price by K153,374,053 from K242,296,469 to K395,670,523 representing an increase of 63 percent on the original contract price.

**d. Physical Inspection**

The following observations were made during site visit:

**i. Leopards Hill Road from State Lodge Junction to Katoba Basic School**

The road ended at Km 39+750 instead of Km 43+800 as stated in the contract. About 4.05 km was missing in the project length.

**ii. Reflective Cracking on UNZA – Kamloops Link**

No sealing of the crack had been undertaken as per SATCC clause 4907.



*Reflective Cracking on the road surface.*



*Evidence of reflective cracking going through the base.*

### **iii. Drainage Problems on NASDEC link roads**

The drainage system did not have an outlet for the storm water leading to ponding at the entrance to the Showground.



*The NASDEC Road had a drainage system that did not have an outlet for the storm water leading to ponding at the entrance to the Showground*

### **iv. Location of Street Lights and Electricity Poles**

The electricity poles near Football House were less than 1 metre from the edge of the carriage way contrary to SATCC Geometric standard 5.8.



*Electricity poles less than 1 metre from the edge of the carriage way*

**v. Sunset Stadium Road Link Base Coring**

The maximum core thickness retrieved was 50 mm. For the trial pit on stabilised base thickness of 110 mm was measured. The variation was well out of the accepted tolerance of 27 mm for the base course implying that the least thickness that can be accepted is 123 mm.



*A core on Nkholoma Stadium road retrieved with a stabilised base thickness of 50mm contrary to the required 150mm.*



*A core on Nkholoma Stadium road retrieved without any Base Material*



*A trial pit on Nkholoma Stadium Road with a stabilised base thickness of 110mm.*

## **COPPERBELT PROVINCE**

### **23. The Periodic Maintenance of 14 km of Road M016/M004 from Kalulushi to Sabina Road and 9 km of the Sabina to Mufulira Road on the Copperbelt Province**

On 12<sup>th</sup> December 2012, RDA engaged China Geo - Engineering Corporation Southern African Limited for the periodic maintenance of 14 km of Road from Kalulushi to Sabina and 9 km of Sabina to Mufulira Road on the Copperbelt Province at a contract sum of K26,813,995 VAT inclusive with a completion period of eight (8) months. The contract was varied twice to a new contract price of K138,159,612.

The scope of works included among other things milling existing pavement, pothole and edge repairs, reconstruction, surface dressing, drainage, and ancillary works.

The contract start date was 26<sup>th</sup> December 2012 and the initial completion date was 26<sup>th</sup> August 2013.

As of December 2016, the contractor had been paid amounts totalling K61,277,987.

The Certificate of Practical Completion was issued by the consultant on 28<sup>th</sup> November 2014 with the defects liability running up to 18<sup>th</sup> November 2015.

Public Procurement Regulation No. 150 of 2011, Sub regulation (3) states that a contract shall include a maximum limit on the variations which may be issued without an amendment to the contract in accordance with regulation 149 - Contract Amendments.

However, the following were observed:

- i. Contrary to sub regulation (3) above which requires a contract to include a maximum limit on the variations which may be issued without an amendment to the contract, the contract signed with China Geo - Engineering Corporation Southern African Limited did not have a maximum limit.
- ii. On 27<sup>th</sup> May 2013, the Director for Road Construction sought authority from the Procurement Director to vary the scope of works from periodic maintenance to complete rehabilitation due to the deplorable state of the road whose base and underlying pavements had completely failed and to incur additional cost above the contract sum amounting to K53,799,099 bringing the revised contract sum to K80,613,093. The authority was granted on 31<sup>st</sup> May 2013.

- iii. On 5<sup>th</sup> October 2013, the Acting Director for Construction and Rehabilitation sought authority from the Procurement Director to vary the scope of works to include the rehabilitation of 9.0 km of M7 Kitwe to Kalulushi Road, including the surfacing of 5 km of Lufwanyama Township Roads through Variation Order No. 2 at an additional cost of K57,546,519 bringing the revised contract sum to K138,159,612. On 7<sup>th</sup> January 2014, the authority was granted.

In this regard, the two variations amounting to K111,345,617 representing 415 percent of the original contract price of K26,813,995 were not only excessive, but remote to the original contract. The change of scope therefore resulted in uncompetitive contract sum.

#### **24. Kitwe – Chingola Dual Carriage Way**

On 15<sup>th</sup> March 2013, RDA engaged Sinohydro Zambia Limited for the construction of a dual carriageway between Kitwe and Chingola (45.5 km) on the Copperbelt Province at a contract sum of K561,813,606 VAT inclusive with a contract completion period of twenty four (24) months.

The project start date was 23<sup>rd</sup> April 2013 and the initial project completion date was 23<sup>rd</sup> April 2015 which was later extended to 23<sup>rd</sup> June 2016. The contract sum was revised to K844,912,167.

As of December 2016, the contractor had been paid amounts totalling K222,971,775.

Further, on 13<sup>th</sup> June 2013, RDA engaged Rankin Engineering Consultants at a contract sum of K13,448,027. The contract sum was revised to K17,218,823. The consultant's scope of works was for the design review and construction supervision of the dual carriageway.

The following were however observed:

##### **a. Late Recruitment of the Supervising Consultant**

The supervising consultant was engaged on 13<sup>th</sup> June 2013 while the works contract commenced on 23<sup>rd</sup> April 2013 resulting in a delay of two (2) months

##### **b. Wasteful Expenditure on Payment of Interest**

Due to delays in settling IPC Nos. 5 and 6, the contractor claimed and was paid interest amounting to K603,623.

**c. Failure to Pay the Contractor on Time**

Once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days failure to which the contractor is entitled to charge interest on the outstanding claim.

As of December 2016, the RDA owed the contractor amounts totalling K97,404,223 in respect of seven (7) unpaid IPCs. As of December 2016, the contractor had suspended works and was not on site.

**25. Rehabilitation of 23.5 km of Selected Urban Roads in Chingola town on the Copperbelt Province**

The RDA engaged Red Lion Construction Zambia on 10<sup>th</sup> March 2010 at a contract sum of K33,397,491 for the rehabilitation of 23.5 km of selected Chingola Urban roads with a commencement date of 24<sup>th</sup> May 2010 and a completion date of 23<sup>rd</sup> January 2011.

The following were observed:

**a. Contract with Red Lion Construction Zambia - Failure to Appoint a Supervising Consultant**

It was observed that throughout the project implementation period, there was no supervising consultant appointed to supervise the works for Red Lion Construction Zambia.

Although in response management stated that the Regional Manager of the Copperbelt and his team attended to all matters of the project until the supervision consultant was appointed, the Regional Manager's team lacked the necessary equipment and their presence was not permanent as would be required of a supervising consultant. This contributed to the delays in implementing the project.

On 10<sup>th</sup> March 2011 pursuant to clause 59 of the contract, the RDA terminated the contract due to failure by the contractor to perform as he had only managed to execute 5 percent of the value of the road works in twelve (12) months. It was however not possible to determine how much had been paid to the contractor at the time of termination.

**b. Contract with Mivami Construction Zambia Limited**

On 18<sup>th</sup> June 2012, RDA engaged Mivami Construction Zambia Limited at a contract sum of K67,199,617 VAT inclusive with a commencement date of 3<sup>rd</sup> July 2012 and a completion period of twelve (12) months following the termination of the contract with Red Lion Construction Zambia.

The contract sum was revised upwards to K81,998,174 due to a variation in the scope of works resulting from an increase in the Bill of Quantities and the completion date was revised to 3<sup>rd</sup> July 2014.

The scope of works included:

- Asphalt pavements and seals,
- cleaning/de-silting and unblocking of existing drainages,
- Construction of new drainage structures,
- Pothole patching and edge break repairs, and
- Ancillary road works.

As of June 2014, the contractor had done only 37.2 percent and had been paid K27,863,712 which was 41.4 percent of the original contract sum. Due to poor performance, the contract with Mivami Construction Zambia Limited was terminated.

In addition, RDA signed a supervision contract with E.G Petit and Partners Consulting Engineers on 25<sup>th</sup> February 2013 at a contract sum of K3,368,617 which was revised to K6,081,430 and further revised to K8,300,696 on 23<sup>rd</sup> July 2014.

The following were observed:

**i. Late Recruitment of a Supervising Consultant**

The supervising consultant was engaged on 25<sup>th</sup> February 2013 while the works contract commenced on 3<sup>rd</sup> July 2012 resulting in a delay in engaging the consultant by more seven (7) months.

**ii. Contract Termination due to Lack of Capacity**

Before signing of the contract, an inspection team of RDA engineers was assigned to assess the capacity of Mivami Construction Zambia Limited.



On 10<sup>th</sup> May 2012, RDA management wrote to Mivami Construction Zambia Limited informing them of the withdrawal of the letter of intent to award them the contract citing the following reasons:

- i. Inability to meet the mobilisation deadline even after being given an extra two (2) weeks to fully mobilise to site,
- ii. Inadequate essential equipment found on site as compared to what was in the terms of reference, and
- iii. Poor condition of most of the equipment found on site.

On the same day RDA wrote to ZPPA requesting for a cancellation of the authority to award Mivami Construction Zambia Limited a contract and instead award it to the next best bidder.

It was observed that in a letter dated 21<sup>st</sup> May 2012, ZPPA rejected the request and advised RDA to have a meeting with the contractor to resolve the impasse and map out the way forward. However, the outcome of the meeting was not availed for audit.

**iii. Increase in Consultancy Contract Sum due to Extension of Time**

It was observed that due to the extension in time for the completion of the rehabilitation of the 23.5 kilometres from 20<sup>th</sup> October 2013 to 31<sup>st</sup> July 2014, the consultant's contract sum increased by 146.4 percent from K3,368,617 to K8,300,696.

**iv. Unsettled Final Account Liability**

A scrutiny of the Final Account revealed that at the time of contract termination, on 11<sup>th</sup> June 2014 Mivami Construction Zambia Limited owed RDA amounts totalling K9,145,836 because of RDA's failure to recover the advance payment.

**c. Contract with Asphalt Worx Limited - Failure to Pay Contractor on Time**

On 25<sup>th</sup> September 2014, following the termination of the contract with Mivami Construction Limited, the RDA engaged Asphalt Worx Limited for the continuation of works on the 23.5 km of the Chingola Urban Roads at a contract sum of K71,500,000 VAT inclusive with a commencement date of 8<sup>th</sup> October 2014 and a

completion date of 7<sup>th</sup> June 2015. The scope of works included rehabilitation of the selected roads and drainage works.

As of December 2016, the contractor had claimed amounts totalling K25,996,193 out of which K12,962,446 had been paid leaving a balance of K13,033,748 outstanding.

It was noted in this regard that some IPCs were outstanding for periods ranging from 56 to more than 365 days.

In addition, E.G Petit and Partners Consulting Engineer continued as supervising consultant from the Mivami contract. As of January 2015, the consultant had been paid a total of K6,617,025 consisting of K3,368,617 from the Mivami Construction Limited contract and K3,248,408 from the Asphalt Worx Limited contract.

As of December 2016, the contractor had completed the works and the contract was in the defects liability period.

**d. Physical Inspection**

According to the specifications in the contract, the road base was required to have a thickness of 150 mm. Physical inspections of the roads revealed the following:

**i. Kasompe Road**

The three (3) samples (at Km 0+100 LHS & RHS and Km 1+700 RHS) tested on the road did not meet the thickness of 150 mm specified in the contract. Two (2) of the samples at Km 0+100 LHS which measured 87 mm and Km 1+700 RHS which measured 117 mm fell below the minimum tolerable thickness of 123 mm as per SATCC clauses 3405 and 7205

**ii. President Road**

At Km 0+500 LHS, the crushed stone base average base thickness was difficult to measure as the base was blended with existing mine waste rock

road base while the specification required a crushed stone base of 150 mm. See picture below.



*Existing mine waste rock road base  
used as opposed to crushed stone base*

Although in response management stated that the existing road base was found to be adequate and the contractor was therefore not paid for any new crushed stone base resulting in a saving, RDA did not avail documentation to confirm that this was the new design of the road and the interim payment certificate showing that the contractor was not paid for any new crushed stone base.

**iii. Mkushi Road**

At Km 0+400 RHS, the crushed stone base average base thickness was difficult to measure as the base was blended with existing mine waste rock road base. The maximum aggregate size in a stone base is 40mm but it was observed that the existing aggregates was more than double the maximum size and the grading of the base was not consistent with the specification of crushed stone base which may result in early failure of the road.

**iv. Kabompo Road**

At Km 0+400, the base thickness was difficult to measure as it was found to be a neat base (without cement). However, there was no documentary evidence to show the change in design from cement stabilised to neat gravel base.

**v. Mukuba Road**

Potholes were observed on Mukuba road. See picture below.



*Pothole on Mukuba Road*

**26. Construction of Bridge at Mufuchani across the Kafue River - Delayed Payment of Advance Payment and Interim Payment Certificates (IPCs)**

On 16<sup>th</sup> May 2014, RDA engaged China Henan International Cooperation Group Co. Ltd to construct a bridge across the Kafue River at Mufuchani in Kitwe at a contract sum of K62,783,327 (US\$11,459,530.08 VAT inclusive).

The initial completion date was 19<sup>th</sup> November 2015 but was later extended to 3<sup>rd</sup> December 2015 with a contract duration of eighteen (18) months. Contract commencement date was 15<sup>th</sup> May 2014 and substantially completed 5<sup>th</sup> May 2016. The final value of the completed contract was K60,556,401 realising a saving of K2,226,926 on the agreed contract sum. The takeover certificate was issued on 5<sup>th</sup> May 2016 and the works were under defect liability period of twelve (12) months.

However, contrary to Clause 14.2 of the contract which required the employer to make the advance payment to the contractor for the purposes of mobilisation, RDA had not paid the advance payment three (3) months after the contract was signed despite the contractor submitting performance and advance payment guarantees.

Consequently, the contractor claimed interest in amounts totalling K558,200.

**27. Upgrading and Rehabilitation of Approximately 14.6 km of Indeni to T003 Road via Fatima Girls School**

On 23<sup>rd</sup> August 2012, RDA engaged Gomes Haulage Limited to upgrade and rehabilitate approximately 14.6 km of Indeni to T003 Road via Fatima Girls School at a contract sum of K59,004,963 with a completion period of five (5) months. The contract sum was revised to K74,996,225 following the approval of variation orders to include two (2) bridges namely, Twapia and Mukulungwe and access roads that lead to St. Theresa Mission and Chief Malembeka's Palace.

The commencement date was 6<sup>th</sup> September 2012 which was fourteen (14) days after the signing of the contract and was initially supposed to end on 5<sup>th</sup> February 2013. The completion date was later revised to 30<sup>th</sup> April 2014.

Further, on 5<sup>th</sup> December 2012, Kiran and Musonda Consultants was engaged to provide consultancy services for the design and supervision of the project at a contract sum of K10,587,759 with a completion period of twelve (12) months.

As of January 2015, the contractor had been paid amounts totalling K23,578,916.

However, the following were observed:

**a. Late Engagement of the Supervising Consultant**

The supervising consultant was engaged on 5<sup>th</sup> December 2012 while the works contract commenced on 16<sup>th</sup> July 2012 resulting in a delay of five (5) months.

**b. Failure to Re-instate Borrow Pit - Physical Inspections and Test Results**

According to C10103 – Reinstatement of the site - Upon completion of the works or as directed by the Project Manager, all borrow pits, quarry sites, access roads, diversions, campsites and any other temporary works shall be cleared of construction debris and surplus construction material and shall be reinstated as far as practicable to its original condition to the approval of the Project Manager.

During the physical inspection of the road in May 2015, it was observed that the borrow pits were not reinstated despite the project having been completed in April 2014. A follow up visit in October 2016 revealed that the situation had not changed. See picture below.



## **28. Periodic Maintenance of 64 km of Ndola – Kitwe Dual Carriageway**

On 14<sup>th</sup> November 2012, RDA engaged China Jiangxi Corporation for International Technical and Economic Corporation Limited to undertake periodic maintenance of 64 km of Ndola – Kitwe Dual Carriageway at a contract sum of K290,287,688 with a contract period of eighteen (18) months.

Further, a design review and supervision services contract was signed with Ngandu Consulting Limited on 27<sup>th</sup> December 2012 at a contract sum of K8,726,680.

The scope of work in this contract included, but not limited to the following:

- Pothole Patching and Edge Repair,
- Shoulder repair and replenishment,
- Reconstruction of selected sections,
- Asphalt leveling course,
- Asphalt wearing course,
- Drainage Works, and
- Road furniture.

As of December 2016, the contractor had been paid amounts totalling K113,199,881. In addition, the RDA owed the contractor amounts totalling K16,296,360 in respect of two (2) unpaid IPCs.

The following were observed:

### **a. Questionable Supervision by the Consultant**

On 30<sup>th</sup> November 2014, RDA directed the consultants, Ngandu Consulting Limited to prepare a report which would highlight the causes of the failure on some sections of the road.

The consultant reported that the causes of failure were the high bitumen content, fine and coarse aggregates on the 13.2 mm and the 4.7 mm or 2.36 mm sieve respectively. He further reported that human error, selective reporting and poor quality laboratory equipment and production plants played a role in the discrepancies between the results presented for approval and the results obtained during the enquiry. The consultant concluded that the asphalt produced and laid in

the portions exhibiting premature distress deviated from the approved mix which rendered the mix to be gap graded rather than the intended continuously graded.

From the above, it can be seen that there was lack of strict supervision and negligence from the consultant since it was the consultant's responsibility to ensure that the equipment that the contractor was using was properly calibrated and approved the quality of the materials used on the project.

**b. Construction of Road Along the Maposa – Refinery 66KV Line 1 & 2 Leave**

On the 21<sup>st</sup> January 2014, addendum No. 3 was signed varying the scope of works to include the road to Ndola Technical School and Dag Hammarskjold memorial site with an extended completion of three (3) months to 28<sup>th</sup> August 2014. The total cost for this variation of scope was K20,918,481 bringing the contract sum to K311,206,169.

A physical inspection of the road carried out in May 2015 revealed that a section of 1.8 km of the road was constructed between two 66KV electricity transmission lines which were less than 18 meters from the road centre-line contrary to the Public Roads Act Section 21, subsection (2) which defines the width of the road reserve for each class of roads. See picture on the next page.



A scrutiny of correspondence dated 3<sup>rd</sup> June 2014 revealed that the Managing Director for Operations at CEC expressed shock that RDA elected to construct road works so close to old age power infrastructure. However, the Director/CEO for RDA submitted that the road had been in existence way before the Maposa Refinery 66KV power lines 1 and 2 were constructed and the road in question was a gazetted road constructed before 1965.

Although management responded that RDA and CEC have agreed on measures to protect the pylons, the road should not have taken this path and the measures taken represented extra and wasteful expenditure.

**c. Physical Inspection – Visual Inspection**

During the audit the following observations were made:

**i. Ndola Girls Technical Road**

At Km 2+300 to Km 4+100, the road was constructed under and in between Copperbelt Energy Corporation high voltage pylons which posed a serious hazard to road users.

**ii. Ndola Kitwe Carriageway**

- At Km 1+100 RHS, there was an incomplete bellmouth. The bell mouths were not yet surfaced as per SATCC specification requirements of section 1203 road intersections and junctions,
- At Km 50+000, there was rutting between 15mm and 25mm in lane 1 and 11 mm in lane 2,
- At Km 50+500, rutting was between 50mm and 75mm in lane 1 and between 25 mm and 46 mm in lane 2, rutting 100mm/100mm lane 1 and 100mm/73mm lane 2,
- At Km 51+100, after New Check point, rutting 11mm/21mm lane 1 and 17mm/25mm lane 2, and
- Existing old road check point, rutting 50mm/75mm lane 1 and 20mm/10mm lane 2 on adjacent new road rutting 10mm/20mm lane 1 and 10mm/4mm lane 2.

The average rutting was greater than 50 mm when measured under a 3m straight edge contrary to the requirement of maximum of 10mm under clause 4212 CONSTRUCTION TOLERANCES. The Rutting indicates the road surfacing has structurally completely failed. The rutting on the new road was greater than the existing old road.



## **29. Upgrading and Rehabilitation of Approximately 27.32 km of Urban Roads in Ndola**

On 18<sup>th</sup> February 2013, RDA engaged Gomes Haulage Limited to upgrade and rehabilitate approximately 27.32 km of urban Roads in Ndola at a contract sum of K53,942,000 which was revised to K139,270,689 with a completion period of twelve (12) months. The commencement date was 7<sup>th</sup> March 2013 with a completion date of 6<sup>th</sup> March 2014 which was revised to 6<sup>th</sup> March 2015.

As of December 2016, the contractor had been paid amounts totalling K45,619,992. In addition, the RDA owed the contractor amounts totalling K9,529,524 in respect of two (2) unpaid IPCs.

On 14<sup>th</sup> August 2013, Bicon Zambia Limited was engaged to provide consultancy services for the design and supervision of the project.

The following was observed:

### **a. Irregular Variation**

Addendum No. 1 signed on the 19<sup>th</sup> September 2013 between RDA and the Contractor Gomes Haulage Limited, modified the original contract to include 27 km of new roads and extending the duration of the works contract by twelve (12) months from 27<sup>th</sup> March 2014 to 27<sup>th</sup> March 2015 which resulted in additional expenditure of K85,328,688 representing 158 percent over and above the original contract sum. Similarly, the contract for the consultant was extended through addendum No.1 signed on 15<sup>th</sup> May 2014 to twelve (12) months from 27<sup>th</sup> March 2014 to 27<sup>th</sup> March 2015 resulting in an additional cost of K6,272,388 VAT inclusive bringing the total contract sum to K12,097,806.

According to the ZPPA Regulations No. 150 (2), where a variation results in a change in price, any additional funds shall be committed before issue of the variation, unless such funds are already provided by any committed amount for contingencies or similar matters. However, contrary to the regulation, the RDA made the variation of K85,328,688 through addendum No.1 without securing the necessary funds.

Further, in addendum No. 2 which was signed on the 3<sup>rd</sup> June 2015, the parties modified the contract further by extending the completion date by four (4) months to 24<sup>th</sup> July 2015 without any costs.

**b. Physical Inspection of Ndola Urban Roads**

A physical inspection of the Ndola Urban Roads revealed the following:

**i. Inadequate Designs/Quantities**

- A physical inspection of the Industrial Road at the Olympic Milling Company entrance conducted in June 2015 revealed that there was no access into the company due to inadequate design, and the consultant reported that there were no quantities for culverts at the Olympic Milling Company in the contract.
- A second physical inspection of the same road conducted in September 2016 revealed that the access culverts had not been constructed.



- On the Chipulukusu Road, there was inadequate designs on the Railway Crossing in that there were no concrete approaches used which are more resistant to slow moving heavy loads.
- To protect the carriageway from edge breaks as motor vehicles move off the road, there must not be a step change into the shoulder. However, it was observed that the shoulders were not worked on and raised to the

level of the carriageway and as a result, there were edge breaks observed as shown in the picture below.



- It was also observed that some sections of the road to Chipulukusu had old lined drainage which was ignored during the new construction of the road as it ran parallel to the new unlined drainage as shown in the picture below.



A physical inspection in August 2016 revealed that the status remained the same and there was no contractor and consultant on the site.

## **ii. Unlined Drainage**

Lining of drainage structures stops water from easily permeating and weakening the underlying road structures. However, it was observed that the Chipulukusu road drainage was not lined and it was not clear on what basis it was decided not to line the drainage.

A physical inspection carried out in August 2016 revealed that the status remained the same and there was no contractor and consultant on the site.

**iii. Potholes on New Road – Lubuto Twapia Road**

A physical inspection of the Lubuto - Twapia road at chainage 3 +960 at Twapia Market revealed that potholes had already developed on the new road as shown in the picture below.



A physical inspection in August 2016 revealed that the status remained the same and there was no contractor and consultant on the site.

**iv. Encroachments on Chipulukusu Road**

Contrary to the Public Roads Act 2002 which provides for the minimum road reserve of 9m either side from the centre-line, there were structures within 1 m to 2 m on either side of the road as shown in the pictures below.



v. **Other Roads - Trial pits**

It was observed that the thickness of the crushed stone base for the roads detailed below did not meet the required measurement of 150mm:

- **Mulongoti Road**

At Km 0+150 LHS, the Crushed Stone Base thickness measured was 133mm.

- **Chibuku Road**

- At Km 0+100 LHS, the Crushed Stone Base measured was 128mm,

- At Km 0+150 RHS, the Crushed Stone Base measured was 118mm,

- At Km 0+200 LHS, the Crushed Stone Base measured was 105mm.

- **Winter Road**

At Km 0+100 LHS, the Crushed Stone Base measured was 133mm

- **Mango Road**

- At Km 0+040 LHS, the Crushed Stone Base measured was 133mm,

- At Km 0+500 LHS, the Crushed Stone Base measured was 143mm,

- At Km 2+000 RHS, the Crushed Stone Base measured was 123mm.

- **Industrial Silo Road**

At Km 0+000 LHS, the Crushed Stone Base measured was 130mm.

- **Industrial Road**

The Olympic Milling access had no culvert and lined drain due to lack of quantities which were not provided for in the Design.

- **Trade Fair road**
  - At Km 0+000 LHS, the Crushed Stone Base measured was 128mm,
  - There was a burst water pipe which would lead to potholes.
- **Commando Mushili Road**

At Km 0+150 LHS, the Crushed Stone Base measured was 135mm.

- **Kawambwa Road – Main Masala**

At Km 0+150 LHS, the Crushed Stone Base measured was 137mm.

Deleterious material was found in the trial pit contrary to the requirements of SATCC 3602 MATERIALS which states that the aggregate used for crushed-stone base or subbase shall be derived from hard, sound, durable and unweathered parent rock. It shall contain no deleterious material such as decomposed rock, clay or shale.

The contractor was paid for constructing the roads at 150 mm base course as per specifications. However, the roads were consistently constructed with the base of between 105 mm and 143 mm. In this regard, the contractor was likely paid for work not done. A review of the IPC revealed that the consultant certified the road base at 150 mm.

## **CENTRAL PROVINCE**

### **30. Periodic Maintenance of 30 km of the Kabwe – Chibombo Road (T2).**

On 23<sup>rd</sup> March 2015, RDA engaged Sable Transport Limited to undertake the periodic maintenance of approximately 30 km of the Kabwe to Chibombo road at a contract sum of K169,035,362 VAT inclusive with a completion period of eighteen (18) months. The contract's commencement date was 9<sup>th</sup> April 2015 which was revised to 30<sup>th</sup> March 2017 and later to 6<sup>th</sup> October 2017.

The RDA also signed a design review and supervision contract with WCE Zambia Limited on 16<sup>th</sup> March 2015 at a contract sum of K6,233,840.

The scope of works included construction of;

- i. Road markings and traffic signs, provision of guard rails,

- ii. Reconstruction of some sections,
- iii. Overlaying of 14.7 km stretch,
- iv. Ancillary works, installation of drainage structures,
- v. Milling out of existing bituminous material, construction of a crushed stone base for the reaped section, and
- vi. Construction of a new asphalt surfacing extending over the shoulders and construction of an overlay.

As of December 2016, the contractor had been paid amounts totalling K16,903,536.

The following were observed:

**a. Delayed Provision of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor on 16<sup>th</sup> June 2015 two (2) months after the commencement of the works.

**b. Increase in Contract Sum due to Delayed Payments for Certified Claims**

It was observed that although the contract was signed on 23<sup>rd</sup> March 2015, the advance payment was only paid on 22<sup>nd</sup> May 2015 and as of 30<sup>th</sup> September 2016, IPC No. 2 amounting to K8,577,681 had not yet been settled.

It was further observed that the completion date was extended to 6<sup>th</sup> October 2017 with associated costs totalling K5,718,107 due to delayed payments of the advance payment, interim certified claims, delayed issuance of drawings and delayed possession of the site.

**31. Construction of a Fixed Electronic Weighbridge in Mumbwa District of Central Province**

On 19<sup>th</sup> February 2015, RDA engaged Scirocco Enterprises Ltd to construct a fixed electronic Weighbridge in Mumbwa District of Central Province at an initial contract sum of K20,126,346 VAT inclusive. Works commenced on 5<sup>th</sup> March 2015 with a completion date of 4<sup>th</sup> August 2015. The contract was revised upwards to K22,574,168 with a completion date of 15<sup>th</sup> March 2016.

As of December 2016, the contractor had been paid amounts totalling K7,841,985.

The scope of works included:

- Earth works, construction of the driveways and parking areas on concrete pavement platform,
- Construction of weigh bridge house and offices,
- Installation of the water supply and drainage facilities,
- Construction of side and mitre drains,
- Construction of filter lanes,
- Installation of the road signs line marking,
- Construction of weigh bridge structure foundation and pit, and
- Electrical installation for the weighbridge house and offices.

The following were observed:

**a. Delayed Completion**

During a site inspection visit on 14<sup>th</sup> July 2015, the overall progress was at 60 percent. A follow up visit to the project site carried out in September 2016 revealed that the works had stalled and the contractor had since demobilised.

**b. Failure to Pay the Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

As of December 2016, the RDA owed the contractor amounts totalling K4,476,255 in respect of four (4) unpaid IPCs.

**32. Landless Corner - Mumbwa (M020) Road (Lot 1 - 65 km)**

In paragraph 12 of the Auditor General's Report on the Road Development Agency for the period October 2009 to December 2011, mention was made of the construction of the Landless Corner - Mumbwa (M020) road (Lot 1 - 65 km) and in particular, mention was made of irregular award of contract to Wade Adams Piling and Foundation (Z) Limited and termination of contract for non-performance.



On 9<sup>th</sup> May 2013, RDA engaged Jizan Construction Company Limited to upgrade the 65 km of Landless Corner Mumbwa (M020) Road in Central Province at a contract sum of K175,787,988 VAT inclusive with a contract completion period of eighteen (18) months. Contractual works commenced on 29<sup>th</sup> May 2013 with an initial contract completion period of 28<sup>th</sup> November 2014.

Scope of works included the following:

- Upgrading of approximately 65 km of road complete to bituminous standard with double surface dressing,
- Provision of Project Manager's Offices, Laboratory and its maintenance,
- Provision of Project Manager's Junior and Senior Staff Housing and its maintenance,
- Clearing of bush and vegetation,
- Spoiling of unsuitable material,
- Provision of broad markings and traffic signs, and
- Provision of guardrails and other ancillary works.

As of December 2016, the contractor had been paid amounts totalling K57,947,629.

The following were observed:

**a. Engagement of Contractor with Inadequate Experience**

A scrutiny of bidding documents submitted by Jizan revealed that although the contractor was awarded the contract to undertake contractual works, the firm did not possess adequate experience in road construction works and instead had vast experience in construction of buildings.

For instance, the investment certificate submitted was for house construction; the general experience records attached revealed that the road related works that the contractor undertook was by being subcontracted to do part of the works on the 33.83 km Ndola roads project, pothole patching, edge repairs, kerbstone, drainages, culverts, asphalt levelling. The major construction works undertaken were in construction of houses, schools, hospitals and offices.

In addition, key personnel such as the Materials Engineer, Quantity Surveyor and Materials Foreman had no experience in road construction works.

This resulted in poor contract management which was characterised by disputes on mobilisation issues between the contractor and the consultant, failure by the contractor to mobilise gravel and bitumen on time and high staff turnover.

**b. Inadequate Capacity in Subcontractors**

The contractor had eleven (11) subcontractors who were engaged on his behalf by RDA. However, at the time of physical inspection conducted in April 2015, there were only four (4) sub-contractors who should have been on the ground to undertake the works but were not due to non-payment of certified claims.

In addition, it was also reported in a Progress Report No. 24 that sub-contractors deployed to the camp had no capacity to do works as they had no equipment to enable them undertake the works.

**c. Delayed Works**

It was observed that work progress on Mumbwa Landless Corner was behind schedule in that the initial contract duration expired on 28<sup>th</sup> November 2014 and an extension of time was granted which also expired in February 2015. As of July 2015, the overall progress of works done was 53 percent with a time lapse of twenty five (25) months against the original eighteen (18) months representing a time lapse of 138 percent.

Although the physical inspection conducted in August 2015 revealed that the contractor was working on site, the contract had expired. During the physical inspection carried out in September 2016, the works had been suspended.

**d. Inadequate Equipment and Frequent Breakdowns**

Despite submitting schedules of equipment with good working conditions at the project tendering stage, it was observed that the contractor's equipment was inadequate and that it had frequent break downs. Further, although the contractor had to hire eight (8) more tippers in order to help in speeding up works, the objective was not attained as the project works still remained behind schedule.

**e. Poor Contract Management**

Although the contract expired on 28<sup>th</sup> February 2015, there was no further correspondence availed for audit to show whether the contractor was granted another extension of time in which to complete works. A physical inspection conducted in July 2015 revealed that the contractor had continued working without a contract.

Although in response management stated that the contractor had acquired more equipment and improved their performance, this position was not correct because a scrutiny of progress reports showed that the contractor's performance was not up to standard throughout the period of his contract.

Further, the Contractual Clause on communication between the contractor and the client provides that communications between the parties that are referred to in the conditions shall be effective only when in writing and a notice shall be effective only when it is delivered. However, there was no evidence submitted for verification that the RDA informed the contractor that they intended to apply liquidated damages.

**f. Failure to Pay Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

As of October 2016, the contractor was owed amounts totalling K7,535,141 in respect of two (2) unpaid Interim Payment Certificates.

**g. Physical Inspection**

A physical inspection conducted revealed the following:

**i. Surface Irregularity - Visual Inspection/ 3m Straight Edge**

- There were visibly poorly constructed longitudinal joints at Km 5+100 for 46.2 m and at Km 15+300 for 86 m. This is in contrast to SATCC clause 4208 which states that Joints shall be neat and shall have the same texture as the remainder of asphalt, and

- There was visibly poorly constructed road at Km 5+100 showing a depression of 10 mm from KM5+160 to 5+350 and 26 mm at km 5+300 for 86m. The average cross section surface irregularity was 18mm when measured under a 3 m straight Edge indicating it was above the requirement of maximum of 10mm under clause 4212 CONSTRUCTION TOLERANCES AND FINISH REQUIREMENTS in SATCC specification. The depression indicates the poor workmanship of the contractor.

**ii. Bleeding on Surface Dressing - Visual inspection of the Surface Dressing for any obvious defects.**

Visibly poor construction leading to bleeding from Km 12+600 for about 1 km in isolated sections.

**33. Consultation Services for the Techno-Economic Study, Detailed Engineering Design and Tender Document Preparation for the Upgrading of 110 km of the Mumbwa to Itezhi Tezhi Road.**

On 30<sup>th</sup> October 2013, RDA engaged Otieno Odongo and Partners, a company registered in Kenya for consulting services for the techno-economic study, detailed engineering design and tender preparation for the upgrading of the Itezhi Tezhi to Mumbwa Road D769 in Central Province at a contract sum of K3,907,870.

However, on 30<sup>th</sup> October 2013, RDA reversed its decision to engage Otieno Odongo and Partners and instead awarded the contract to Zulu Burrow Development Consultants.

The following were observed:

**a. Commencing Consultancy Work without a Signed Contract**

Although the Zulu Burrow Development Consultant moved on site and started working on 16<sup>th</sup> July 2014, the contract was only signed on 6<sup>th</sup> February 2015. This was contrary to Section 54 of the Public Procurement Act of 2008 which states that, solicitation document shall state the procedure for award of contract, which shall be:

- By placement of a written contract document; or
- By issue of a letter of bid acceptance, which shall be confirmed by written contract.

In their response dated 12<sup>th</sup> December 2016, management stated that the consultant was undertaking a supervisory role on the project pending the finalisation of the consultancy contract as the contractor was already on site.

**b. Communicating Bid Acceptance before Approval of Contract Award**

Section 54 of the Public Procurement Act of 2008 states that, no contract, purchase order, letter of bid acceptance of bid or award of contract shall be issued prior to

- An award decision by the appropriate approvals authority in accordance with section 50;
- Publication and dispatch of the notice of best evaluated bidder in accordance with Section 51;
- Confirmation that the procurement is not subject to administrative review;
- Confirmation that funding is available for the contract; and
- Any other approvals required including the approval of the contract by the Attorney General.

On 7<sup>th</sup> May 2014, RDA informed Zulu Burrow Development Consultants of their successful bid to provide the consultancy services on the project. However, the action to inform the consultant was questionable in that:

- At the time of communicating to the Consultant, neither ZPPA nor the Attorney General had approved the procurement and draft contract respectively, and
- Correspondence indicated that RDA wrote to ZPPA to seek authorisation to single source Zulu Burrow Development Consultants on 15<sup>th</sup> May 2014, one week after notifying the consultant of his successful bid.

It was observed that while the contract signed between RDA and Otieno Odongo was void for reasons that the notice of award was not issued in line with Section 54 (3) of the Public Procurement Act No. 12 of 2008, RDA did not void the award to Zulu Burrow Development Consultants though Section 54 (3) was breached.

**34. Upgrading of Road D769 from Mumbwa/Itezhi Tezhi Junction on M009 to Itezhi Tezhi (109 km) Including the 2.2 km of the Inkonkaile to Itezhi Tezhi Boma Access Road in Central Province**

On 28th February 2014, RDA engaged Build Trust Construction Limited to upgrade 109 km of Road D769 from Mumbwa/Itezhi Tezhi Junction on M009 to Itezhi Tezhi (109 km) including the 2.2 km of the Inkonkaile to Itezhi Tezhi Boma Access Road in Central Province to bituminous standards at a contract sum of K285,886,120 with a completion period of twenty four (24) months.

The scope of works included excavation, grading and other earth works, and road paving and surface sealing, reinforced concrete drainage works and signage.

As of 31<sup>st</sup> December 2014, the contractor had been paid amounts totalling K69,564,643.

The consultant for the project was Zulu Development Company.

However, the following were observed:

**a. Unauthorised Works**

A review of the minutes for the first site meeting held on 8<sup>th</sup> April 2014, revealed that RDA through the Central Province Regional Engineer requested the contractor to grade the main road to a passable state as the designs were being awaited. This arose from the condition of the road at the time. The road was said to have been in a deplorable state such that it was taking seven (7) hours to cover 109 km from Mumbwa /Itezhi Tezhi Junction to Itezhi Tezhi Boma.

The scope of the work proposed under Variation Order No. 1 included, but not limited to the following:

- Grading and shaping of the main road carriageway width of six (6) metres, and
- Backfilling of ditches on the carriageway using borrow materials obtained from within 200metres of the carriageway.

The cost of this variation amounted to K3,270,000.

According to records, the Contractor graded the 109 km of the road hence improved the travel time from 7hrs to 2hrs. However, the following were observed:

- Although the contractor performed under this variation, the procurement committee at its meeting held on 13<sup>th</sup> January 2015, rejected the request to vary the works of grading road D769 and incur additional cost of K3,270,000 VAT inclusive to improve travel time prior to commencement of works. However, at the time of inspection, the contractor emphasised that he had duly done the work and was demanding payment. As of October 2016, the contractor had not been paid.
- These works were executed before Zulu Development Company had been awarded the contract for design and supervision of the project.
- The variation was ordered and executed before the contractor commenced work on the main project.
- RDA allowed the Contractor to execute the variation before getting approval from its Procurement Committee.

**b. Failure to Pay Contractor on Time**

According to the contract once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

As of December 2016, the RDA owed the contractor amounts totalling K18,306,003 in respect of three (3) unpaid IPCs.

**c. Physical Inspection - Surface Irregularity / Visual inspection**

During a physical inspection, the following were observed:

- At Km 0+675 RHS, the average rutting measured was 12mm. see picture below.



*Visual inspection of rutting or surface regularity*

- ii. At Km 2+300 RHS, the area had a lot of houses and would require the following:
  - Extensive drainage works and very good detailed engineering as the new road may drain storm water into surrounding houses,
  - Construct footpaths so that the pedestrians are catered for and safety is increased by separating some modes of transport.

**35. Rehabilitation/ Upgrading Of Approximately 34.47 km of Urban Roads in Kabwe and Kapiri Mposhi Towns in Central Province**

On 15<sup>th</sup> August 2012, RDA engaged Asphalt Roads (Zambia) Limited to rehabilitate and upgrade approximately 34.47 km of urban roads in Kabwe and Kapiri Mposhi towns in Central Province at a contract sum of K165,827,800 with a completion period of fourteen (14) months. The contract was revised several times increasing the total distance to 78.63 km and the contract sum to K410,379,915 with a completion period of up to December 2016.

As of December 2016, the contractor had been paid amounts totalling K147,508,741.

Further, on 17<sup>th</sup> December 2012, NWE Consulting Engineers (Z) Limited was engaged to provide consulting services for the design and supervision of the project at a contract sum of K15,861,790 and an initial completion period of sixteen (16) months. However, this contract was terminated by RDA on 28<sup>th</sup> February 2014 and Rankin Engineering Consultants was engaged at a contact sum of K20,006,240 to provide consultancy services.

The following were observed:

**a. Irregular Variations**

During the period from August 2012 to January 2016, the contract for the rehabilitation of urban roads in Kabwe and Kapiri Mposhi Towns in Central Province was varied by K244,552,115 from K165,827,800 to K410,379,915 representing a variation of 147 percent.



**b. Failure to Pay Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

A review of the progress report for the month of May 2016 and IPC No. 30 revealed that out of the thirty (30) certified IPCs in amounts totalling K148,017,780, only K136,544,314 had been paid leaving a balance of K11,473,466, some of which had been outstanding for sixteen (16) months.

Further, a review of the correspondence by the contractor to the consultant dated 4<sup>th</sup> May 2016, revealed that throughout the project, the contractor was subjected to instructions to carry out works for which there were no tendered rates, worked without time related costs and received orders to purchase new materials in quanta that were subsequently not fully required on the project. For instance, the contractor was claiming an amount of K308,149 for excess of the ordered sign posts as per NWE Consulting Engineers instructions. As a result, the contractor submitted a claim in amounts totalling K15,614,320 inclusive of interest of K3,299,186 for non-payment of the uncertified amounts. The contractor further indicated that the non – payment may affect ability to continue on the contract. As of October 2016, the amount had not been certified.

The progress report revealed that RDA was in fundamental breach of the contract because of late and non-payment of outstanding amounts and therefore, the contractor suspended works on the project in December 2015 and as of October 2016, works had not resumed, but the contract was due to expire in December 2016.

**c. Physical Inspection**

The physical inspections carried out in 2015 revealed the following:

**i. President Road-Kabwe**

At Km 0+102 RHS and Km 2+100 LHS, the drilled core crumbled. The stabilization percentage was 1%. The basis of including 1 percent for stabilization was questionable as no laboratory test results were presented for audit verification.

**ii. Makululu Road-Kabwe**

- At Km 0+400 LHS, the drilled core crumbled. The average base thickness was 120 mm from the trial pit.
- At Km 1+500 RHS, the drilled core crumbled. The average base thickness was 148 mm from the trial pit.
- At Km 3+000 LHS, the drilled core crumbled. The average base thickness was 150 mm from the trial pit.
- The quality of road markings was not acceptable in that they had faded.

**iii. Luangwa Road-Kabwe**

At Km 0+100 LHS, the drilled core crumbled.

**iv. Uganda Road-Kabwe**

At Km 1+050 RHS, the drilled core crumbled.

**v. Chilubi Island Road - Kabwe**

- At Km 0+150 LHS, the drilled core crumbled.
- The dips along the main road were poorly designed as they were too deep and the motorists were having problems driving through.

**vi. Munkoyo Road - Kabwe**

- At Km 0+700 LHS, the crushed stone base thickness was measured as 140 mm, and
- At Km 1+700 RHS, crushed stone base thickness was measured as 130 mm.

**vii. Buntungwa Road - Kabwe**

- At Km 0+700 LHS, the crushed stone base thickness was measured as 110mm
- At Km 1+700 RHS, crushed stone base thickness was measured as 130mm.
-

**viii. Kapiri Main/ Independence Road – Kapiri Mphoshi**

At Km 0+300 LHS, the drilled core crumbled.

**ix. Tazara road – Kapiri Mphoshi**

At Km 0+300 LHS, asphalt core retrieved measured 50mm and the crushed stone base measured 125mm against required 150mm.

**36. Periodic Maintenance of 65.5 km of Kabwe to Kapiri Mposhi (T002) in Central Province**

On 13<sup>th</sup> February 2013, the RDA awarded a contract to Roads and Paving Zambia Limited for periodic maintenance of 65.5 km of Kabwe to Kapiri Mposhi (T002) in Central Province for an initial contract period of twelve (12) months at an original contract sum of K144,079,095. The commencement date was 27<sup>th</sup> February 2013 which was (14) fourteen days after the signing of the contract which initially was supposed to end on 26<sup>th</sup> February 2014, revised to 31<sup>st</sup> July 2015. The actual commencement date was 8<sup>th</sup> April 2013 and the completion date was 7<sup>th</sup> April 2014. As of December 2016, the contractor had been paid amounts totalling K61,162,605.

On 6<sup>th</sup> June 2013, Rankin Engineering Consultants was engaged to provide consultancy services for the design review and supervision of the periodic maintenance of 65.5 km of Kabwe to Kapiri Mposhi (T002) at a contract price of K6,080,501 with a completion period of twelve (12) months.

The following were observed:

**a. Late Engagement of the Supervising Consultant**

The supervising consultant was engaged on 6<sup>th</sup> June 2013 while the works contract commenced on 8<sup>th</sup> April 2013 resulting in a delay of two (2) months.

**b. Lack of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor as at 21<sup>st</sup> May 2013.

**c. Delayed Settlement of Interim Payment Certificates**

A review of the progress report for May 2016 and IPC No. 30 revealed that out of the thirty (30) certified IPCs in amounts totalling K148,017,780, only K136,544,314 had been paid leaving a balance of K11,473,466, some of which had

been outstanding for as long as sixteen (16) months. As a result, the contractor claimed interest in amounts totalling K3,299,186 for non-payment of the certified amounts. In December 2015, the contractor suspended works on the project.

## MUCHINGA PROVINCE

### **37. Upgrading of Isoka – Muyombe- Chama- Lundazi Road to Bituminous Standard in Eastern Province of Zambia Lot 4 (Muyombe Road Junction) to Lundazi (Km40+000 on D103) to (84 km)**

On 28<sup>th</sup> December 2015, RDA engaged China Civil Engineering Construction Corporation (Z) Limited to upgrade Isoka – Muyombe - Chama - Lundazi road to bituminous standard in Eastern Province (Muyombe Road Junction - Lot 4) to Lundazi (Km40+000 on D103) to (84 km) at a contract sum of K585,556,978 VAT inclusive with a completion period of twenty four (24) months, and a planned commencement date of 11<sup>th</sup> January 2016, which was fourteen (14) days after the signing of the contract.

As of December 2016, the contractor was paid K40,764,250.

The scope of works included among other things; clearing of bush and vegetation, construction of drainage structures, construction of bridges, mass earthworks, construction of pavement layers, construction of a double surface dressing wearing course, road marking and road furniture, and finishing of the road reserve.

The following were observed:

#### **a. Award of Contract to Company which Failed to Comply with Instructions to Bidders**

Although the Tender Evaluation Committee recommended that the contract for the upgrading of the Isoka-Muyombe-Chama-Lundazi road (Lot 4) be awarded to China Civil Engineering Construction Corporation (Zambia) Limited, a review of the tender evaluation report revealed that the bidder did not comply with the Instructions to Bidders on the following:

- i. The bidder altered the letter of bid by excluding the clause on the no conflict of interest, but the Committee recommended that the bidder be requested to submit the declaration during negotiations.
- ii. The bidder did not specify the qualifications of the laboratory technician as per requirement. The Evaluation Committee recommended that the bidder clarifies the qualifications of the proposed laboratory technician during negotiations.

- iii. The bidder submitted a line of credit which had a disclaimer which removed any liability or guarantee on the part of the Bank. The Evaluation Committee recommended that the bidder submits a letter of credit without a disclaimer during negotiations.

Despite the bidder's failure to comply with the instructions to bidders, the Evaluation Committee recommended that the contract for the upgrading of Isoka-Muyombe-Chama-Lundazi (Lot 4) be awarded to China Civil Engineering Construction Corporation (Z) Limited.

Further, a scrutiny of the minutes for the Pre-Contract Negotiation meeting dated 31<sup>st</sup> July 2015 between the RDA and the contractor revealed that the RDA did not request the contractor to submit the above stated requirements.

**b. Engagement of Contractor before Engagement of Consultant**

Contrary to generally accepted construction contract administration process whereby a consultant is first engaged and designs of the project developed and then a Contractor is engaged and supervised by the Consultant, RDA engaged the Contractor – China Civil Engineering Corporation (Z) Limited on 28<sup>th</sup> December 2015 without engaging the consultant. As of October 2016, the contract with the consultant and the tender evaluation report had not be availed for audit.

**c. Failure to Provide Approved Detailed Designs to Contractor at Commencement**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor as of September 2016.

**38. Upgrading of Isoka – Muyombe – Chama - Lundazi Road to Bituminous Standard in Eastern Province of Zambia Lot 5 (Muyombe Road Junction) to Lundazi (Km40+000 on D103) to (84Km)**

On 28<sup>th</sup> December 2015, RDA engaged Sable Transport Limited to upgrade Isoka - Muyombe - Chama - Lundazi road to bituminous standard in Eastern Province under Lot 5 (Muyombe Road Junction) to Lundazi (Km40+000 on D103) to (84 km) at a contract sum of K417,108,471 VAT inclusive with a completion period of eighteen (18) months.

The scope of works included among other things; culvert construction, minor bridge construction, earthworks, construction of diversions, pavement layer works, surfacing,

provision of road furniture, construction of drains, installation of street lights, construction of walkways, clearing and grubbing, ancillary works.

As of December 2016, the contractor had been paid amounts totalling K26,081,701.

The following were observed:

**a. Engagement of Contractor before Engagement of Consultant**

Contrary to generally accepted construction contract administration process whereby a consultant is first engaged and designs of the project developed and then a Contractor is engaged and supervised by the Consultant, RDA engaged the Contractor – Sable Transporters Limited on 28<sup>th</sup> December 2015 without engaging the consultant. As of April 2016, the RDA had not availed for audit the contract and tender evaluation report for the consultant.

**b. Unjustified Direct Bidding (Single Sourcing)**

Clause 32 (1) of the Public Procurement Act of 2008 states: “the objective of direct bidding shall be to achieve timely and efficient procurement where the circumstances or value do not justify or permit the use of competition”. The Act also allows direct bidding where goods and services are available from a single supplier or contractor and that such a service is urgently required.

A review of the tender evaluation report dated July 2015 revealed that RDA single sourced Sable Transport Limited without meeting the justification as stated in Clause 32 (1) of the Public Procurement Act of 2008.

**c. Award of Contract to a Company which Failed to Comply with Instructions to Bidders**

Although the Tender Evaluation Committee recommended that the contract for the upgrading of the Isoka-Muyombe-Chama-Lundazi road under Lot 5 be awarded to Sable Transport Limited, a review of the Tender Evaluation Report revealed that the bidder did not comply with the Instructions to Bidders on the following:

- i. The bidder changed the rates for a number of items from the predetermined rates to their own increased rate.
- ii. The bidder submitted only one project with a value of at least 75% of the bid sum contrary to the required two projects

This being a single source, the Evaluation Committee ignored the instructions to bidders and declared Sable Transport Limited as responsive even when they were not responsive and recommended that the contract for the upgrading of the Isoka-Muyombe-Chama-Lundazi road (lot 5) be awarded to Sable Transport Limited.

**d. Delayed Advance Payment and Failure to Settle IPC**

Section 48.1 of the Specific Conditions of Contract provides that the advance payment shall be up to 10 percent of contract sum, upon submission of an acceptable Bank Guarantee or Bond from an insurance company of equal amount. Section 48.2 provides that the contractor is to use the advance payment for equipment, plant, materials and mobilisation expenses. In this regard, an Advance Payment Guarantee which is valid until 31<sup>st</sup> December 2017 was submitted to RDA in January 2016 to enable the contractor to be paid the advance payment of K41,710,847.

As of December 2016, the RDA owed the contractor amounts totalling K64,557,189 in respect of unpaid IPCs. Included in the amount of K64,557,189 is an amount of K24,710,847 which was the balance outstanding from the advance payment. See table below.

IPC No.	Date Certified	Payment Due Date	Amount K	Amount Paid K	Outstanding K
Advance Payment	30.12.15	26-01-16	41,710,847	17,000,000	24,710,847
2	22-02-16	19-03-16	14,355,000	-	14,355,000
3	21-04-16	21-04-16	5,255,300	-	5,255,300
4	17-05-16	17-06-16	3,236,042	-	3,236,042
<b>Total</b>			<b>64,557,189</b>	<b>17,000,000</b>	<b>47,557,189</b>

It was further noted that as a result of delayed payments, the project faced the following problems:

- i. Lack of a fully equipped materials laboratory on site
- ii. Unavailability of contractor’s safety officer on site which had resulted in some lapses bordering on safety on site
- iii. Insufficient accommodation for the project manager’s supervision staff on site
- iv. The contractor’s non-provision of the specified number and type of supervision vehicles for the project managers’ staff.



**39. Construction of the Matumbo and Kampemba Bridges across Luangwa and Kampemba Rivers in Chama District of Muchinga Province - Delayed Commencement of Project**

On 16<sup>th</sup> February 2015, RDA engaged China Railway Seventh Group (Z) Limited to construct the Matumbo and Kampemba Bridges across Luangwa and Kampemba rivers in Chama District of Muchinga Province at a contract sum of K103,881,127 VAT inclusive with a completion period of fourteen (14) months, and a planned commencement date of 1<sup>st</sup> March 2015 which was fourteen (14) days from the signing of the contract and in accordance with GCC 1.1 (aa) of the specific condition of the contract. The scope of works included among other things; construction of the two bridges on the two crossing points. As of December 2016, the contractor had been paid amounts totalling K7,791,084.

The Consultant for the project was Kiran & Musonda Associates.

Due to the non-payment of the advance, the contractor did not mobilise for the whole initial fourteen (14) months contract duration. As a result, addendum No. 2 was signed on 30<sup>th</sup> June 2016 and varied the original contract as follows:

- i. the completion date from 31<sup>st</sup> May 2016 to 28<sup>th</sup> February 2018,
- ii. increased the scope of works by incorporating the construction of a temporary bridge across Luangwa River, and
- iii. contract sum from K103,881,127 to K116,643,471 to cater for the time related costs and construction of a temporal bridge at Luangwa River using existing rates in the contract.

The contractor also stated that the original bid for the project was submitted on 15<sup>th</sup> August 2014 and with time, there were significant changes in the economic conditions which were unforeseen then. The increase in the contract sum therefore in part was due to the delayed implementation of the project and could have been avoided had the project been implemented on time.

GCC 1.1 (aa) of the specific condition of contract states that the start date shall be 14 days after contract signing. Since the contract was signed on 16<sup>th</sup> February 2015, the start date should have been 1<sup>st</sup> March 2015. On 2<sup>nd</sup> March 2015, through a commencement order dated 2<sup>nd</sup> March 2015, RDA instructed the contractor to commence works.

A review of correspondence dated 21<sup>st</sup> January 2016 by RDA to NRFA revealed that the project had not commenced one (1) year after signing of the contract because the advance payment had not been processed and therefore the contractor could not mobilise to site. This was despite the contractor having obtained and submitted a performance guarantee on 9<sup>th</sup> April 2015 which was to expire not later than 15<sup>th</sup> October 2016.

As of December 2016, there was no evidence that the advance had been paid.

**40. Periodic Maintenance of the (T002) Great North Road from Chinsali to Nakonde Road (213 km)**

On 29<sup>th</sup> September 2014, RDA engaged China Henan Corporation Group Co. Limited for the periodic maintenance of 213 km of the Chinsali to Nakonde Road at a contract sum of K73,290,934 VAT inclusive with a completion period of twelve (12) months, and a commencement date of 28<sup>th</sup> October 2014 with completion date of 14<sup>th</sup> October 2015.

The scope of works included among other things; pothole patching, construction of shoulders, reconstruction of selected sections, repair/replacement of drainage structures, road furniture.

As of December 2016, the contractor had been paid amounts totalling K32,247,362,

The following were observed:

**a. Failure to Pay Contractor on Time**

According to the contract, IPCs were supposed to be settled within twenty eight (28) days. Although the commencement date of the contract was 28<sup>th</sup> October 2014, as at 31<sup>st</sup> March 2015, the contractor had not been paid the 7.5 percent advance payment amounting to K5,496,820.

As of December 2016, the RDA owed the contractor amounts totalling K44,166,250 in respect of seven (7) unpaid IPCs.

**b. Lack of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, RDA did not provide the contractor with detailed road engineering designs at the commencement of works.

**c. Change of Key Personnel without RDA Approval**

A verification of key personnel on site in April 2015 revealed that the contractor

had changed key personnel without seeking approval from RDA. See table below.

S/N	Position
1	Contract Manager
2	Site Agent
3	Materials Engineer
4	Surveyor
5	Earthworks Foreman
6	Ceiling Foreman
7	Laboratory Supervisor

**41. Isoka – Muyombe – Chama – Lundazi Road (Lot 1)**

On 13<sup>th</sup> January 2011, RDA engaged China Jiangxi Corporation for International Economic and Technical Cooperation for the upgrading of the 90 km of Isoka – Miyombe – Chama – Lundazi road (Lot1- T2/D790 Junction) to bituminous standard at a contract sum of K213,805,420 which was revised to K331,189,097. The works commenced on 27<sup>th</sup> January 2011 with an initial completion date of 26<sup>th</sup> January 2013 which was revised to 31<sup>st</sup> October 2016.

As of December 2016, the contractor had been paid amounts totalling K95,083,891.

In addition, in February 2011, the RDA also signed a consultancy contract with Bari Zambia for the supervision of road works at a contract sum of K3,803,518 which was revised upwards to K5,184,962.

The following were observed:

**a. Lack of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, RDA did not provide the contractor with detailed road engineering designs at the commencement of works. Following the detailed design of the road, the scope of works increased resulting in the contract price being revised upwards by K117,383,811 from K213,805,420 to K331,189,097 representing an increase of 54.90 percent.

In addition, the consultant’s supervision contract sum was also revised upwards by K1,381,444 from the original contract sum of K3,803,518 to K5,184,962.

**b. Delayed Completion of Works**

The road works were scheduled to have been initially completed on 26<sup>th</sup> January 2013. However, the completion date was extended to 26<sup>th</sup> January 2014 due to the contractor’s failure to finish the works on time. It was observed that even with the

extended time of one year, the contractor still failed to complete the works by 26<sup>th</sup> January 2014.

**c. Failure to Pay Contractor on Time**

According to the contract, IPCs were supposed to be settled within twenty eight (28) days. Contrary to this requirement, as of December 2016, RDA had not paid the contractor amounts totalling K71,154,206 in respect of nine (9) Interim Payment Certificates (IPCs) which had been outstanding since November 2014.

**d. Physical Inspection**

Two (2) inspections, a visual and a stabilized base coring were done.

The visual inspection revealed that there was rutting (depressions) greater than the maximum allowable rutting (10 mm) implying that the road base was weak at the following kilometers:

- At Km 8+000, rutting  $\geq$  15mm.
- At Km 11+200, rutting  $\geq$  17mm.
- At Km 14+000, rutting  $>$  10mm.
- At Km 17+500, rutting  $>$  10mm.
- At Km 25+000, rutting  $>$  10mm.

It was further observed that there were notable visible cracks on the road surface. However, no remedial works were undertaken as of December 2016. See picture below.



*Surface Irregularity on the road*



*Cracks on the newly constructed road*

Stabilised base coring inspections carried out by RDA revealed that all the cores that were retrieved did not meet the 150mm thickness or the 123mm minimum thickness as per SATCC clauses 3405 and 7205 as detailed below:

- At Km 2+500, core crumbled. In the trial pit the base was measured to be 100mm thick,
- At Km 8+000, core crumbled. In the trial pit the base was measured to be 135mm thick,
- At Km 14+000, core retrieved was 75 mm thick. In the trial pit the base was measured to be 135 mm thick,
- At Km 17+500, core retrieved was 85 mm thick. In the trial pit the base was measured to be 135 mm thick,
- At Km 19+000, core retrieved was 95 mm thick. In the trial pit the base was measured to be 120 mm thick,
- At Km 25+000, core retrieved was 85 mm thick. In the trial pit the base was measured to be 130 mm thick,
- At Km 34+400, core retrieved was 120 mm thick. In the trial pit the base was measured to be 135 mm thick,
- At Km 38+500, core crumbled. In the trial pit the base was measured to be 100mm thick,
- At Km 46+600, core crumbled. In the trial pit the base was measured to be 130mm thick, and
- At Km 49+500, core crumbled. In the trial pit the base was measured to be 155mm thick.

There were no remedial works undertaken as of December 2016 as required under SATCC 1218. See picture below.



*Measurement of base*

#### **42. Mbala – Nakonde Road**

On 15<sup>th</sup> April 2011, the RDA engaged China CAMC Engineering Company for the upgrading to bituminous standard of the Mbala to Nakonde Road (171.9km) at a contract sum of US\$180,000,000 VAT inclusive with a completion period of thirty-six (36) months ending 14<sup>th</sup> April 2014. A review of contract documents revealed that the contract completion period had been extended to 19<sup>th</sup> June 2016. As of July 2016, the contractor had been paid a total of US\$179,219,206.04.

In addition, on 10<sup>th</sup> August 2012, the RDA signed a consultancy contract with Bari Zambia at a contract sum of K8,109,235. As a result of the extension of time, the supervising consultants' contract sum went upwards by 56.1% to K12,658,059.

As of December 2016, the consultant had been paid amounts totalling K7,159,522, while K3,579,172 was outstanding in respect of eight (8) IPCs.

The project was being funded by a loan from the EXIM Bank of China.

The initial scope of works was the upgrading to bituminous standard class 1C of the D1 Mbala to Nakonde Road and included the following:

- Detailed design review, and
- Construction supervision of works.

The following were however observed:

**a. Increased Cost of Supervision Services on Road Construction due to Change in Road Designs and Increase in Scope of Works**

The RDA signed a supervision contract with Bari Zambia at a contract sum of K8,109,235 on 10<sup>th</sup> August 2012. In this regard, during the period from April 2011 to the time of the engagement of the consultant, works were done without supervision leading to delays in undertaking the works as evidenced in a letter dated 6<sup>th</sup> August 2012, where the contractor observed that the electronic copy of the drawings conflicted with the hard copy and that there were also missing items.

As a result of the consultant's work, variations were required on the scope of works which led to an extension of the completion date. Due to the extension of the completion date of the construction works, the supervision contract was extended by thirteen (13) months and the contract sum was revised upwards by an additional K4,548,824 representing an increase of 56.1% of the original contract. The revised contract sum therefore stood at K12,658,059 as of May 2015.

**b. Change of Key Personnel without RDA Approval**

A verification of key personnel on site in April 2015 revealed that the contractor had changed the key personnel without seeking approval from RDA. See table below.

S/N	Position
1	Materials Engineer
2	Surveyor
3	Earthworks Foreman

**c. Physical Inspection**

During the inspections of the road signs retro reflectivity, the following were observed:

- i. At km 171+900 LHS, an information sign with a green on white background had retro reflectivity of 39.4 at an observation angle of 0.2<sup>0</sup>. The sign's reflectivity at 0.2<sup>0</sup> did not meet the required minimum of 50, and

- ii. At km 166+000 RHS, a bus bay sign with a white on blue background had retro reflectivity of 32.8 at angle 0.2<sup>0</sup>. The sign's reflectivity at 0.2<sup>0</sup> did not meet the required minimum of 50.

#### **43. Periodic Maintenance of 131 km of the Mpika to Chambeshi Bridge – Lot 1**

On 21<sup>st</sup> March 2014, RDA engaged Dawiq Limited in joint venture with Keren Motors Limited for the periodic maintenance of 131 km of the Mpika to Chambeshi Bridge – Lot 1 at a contract sum of K118,299,975 VAT inclusive with a completion period of twelve (12) months, and a commencement date of 15<sup>th</sup> April 2014. The completion date was extended to 14<sup>th</sup> April 2016.

The scope of works included; pothole patching, construction of shoulders, reconstruction of selected sections, repair/replacement of drainage structures, road furniture.

As of December 2016, the contractor had been paid amounts totalling K14,363,146.

The following were observed:

##### **a. Lack of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor as of July 2015.

##### **b. Failure to Pay Advance Payment on Time**

Contrary to the contract which required that the employer makes advance payments to the contractor upon provision by the contractor of an unconditional bank guarantee /insurance bond, as of September 2016, the RDA had not paid the contractor the advance payment of K11,829,997 in full as only K9,581,220 had been paid despite the bank guarantee having been submitted on 18<sup>th</sup> July 2014.

##### **c. Delayed Commencement of Works**

Contrary to the contract which required that the contractor commence works within fourteen (14) days after signing the contract, the works had not commenced as of July 2016. In a correspondence dated 25<sup>th</sup> July 2014 the RDA CEO expressed concern that the contractor had not commenced works three months after the order was issued on 15<sup>th</sup> April 2014.



**44. Upgrading to Bituminous Standard of 94 km of the Safwa to Mulilansolo to Chinsali Road Lot 1**

On 26<sup>th</sup> March 2014, RDA engaged Raubex Construction Limited to re-align and upgrade to bituminous standard approximately 94 km of the Safwa to Chinsali to Mulilansolo Road Lot 1 at a contract sum of K264,798,761 VAT inclusive with a completion period of thirty (30) months with a commencement date of 15<sup>th</sup> September 2014. The completion date for the project was 14<sup>th</sup> March 2017.

The scope of works included drainage related works, road related works and ancillary related works.

As of December 2016, the contractor had been paid amounts totalling K21,591,988.

On 25<sup>th</sup> February 2015, Bari Zambia Limited was engaged to provide consultancy services at a contract sum of K14,458,182 for both Lot 1 and 2. As of December 2016, the consultant had been paid amounts totalling K10,016,968 leaving a balance of K4,786,529 in respect of thirteen (13) unpaid fee notes.

The following were observed:

**a. Lack of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor as of July 2015.

**b. Late Engagement of the Supervising Consultant**

The supervising consultant was engaged on 25<sup>th</sup> February 2015 while the works commenced on 15<sup>th</sup> September 2014 resulting in a delay of more than five (5) months.

**c. Failure to Pay Advance Payment on Time**

Contrary to the contract which required that the employer makes advance payments to the contractor upon provision by the contractor of an unconditional bank guarantee /insurance bond, the RDA failed to pay the contractor the advance payment in full as only K2,028,120 was paid out of K19,859,907 despite the contractor having submitted the bank guarantee as required. As of September 2016, an amount of K17,831,787 of the advance payment was still outstanding.

**d. Failure to Pay Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

As of December 2016, the RDA owed the contractor amounts totalling K22,499,585 in respect of fourteen (14) unpaid IPCs which remained outstanding for more than one hundred (100) days.

**45. Upgrading to Bituminous Standard of 100 km of the Safwa to Mulilansolo to Chinsali Road Lot 2**

On 9<sup>th</sup> May 2013, RDA engaged Sinohydro Zambia Limited to re-align and upgrade to bituminous standard approximately 100 km of the Mulilansolo to Chinsali to Safwa Road Lot 2 at a contract sum of K295,906,766 VAT inclusive with a completion period of twenty four (24) months, with a commencement date of 23<sup>rd</sup> May 2013. The completion date for the project was 23<sup>rd</sup> May 2015.

The scope of works included drainage and related works, road related works and ancillary related works.

As of December 2016, the contractor had been paid amounts totalling K79,003,212.

The following were observed:

**a. Late Engagement of the Supervising Consultant**

The supervising consultant was engaged on 25<sup>th</sup> February 2015 while the works contract commenced on 23<sup>rd</sup> May 2013 resulting in a delay of about twenty two (22) months.

**b. Lack of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, RDA did not provide the contractor with detailed road engineering designs at the commencement of contract. The following were observed:

- On 30<sup>th</sup> October 2013, five (5) months after signing the works contract, RDA signed an agreement with the contractor to prepare the detailed road engineering designs at an agreed sum of K6,206,000. The designs for the first 20 km of the 100 km were submitted to RDA in November 2013. However,

they were only approved on 2<sup>nd</sup> April 2014 resulting in a delay of three hundred and fifteen (315) days.

- The designs for the remaining 80 km were only approved on 8<sup>th</sup> January 2015, two (2) years after the commencement of the project.

**c. Failure to Pay Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

As at 31<sup>st</sup> December 2016, the contractor was owed amounts totalling K38,737,340 in respect of five (5) unpaid IPCs. The contractor therefore invoked Clause 28.1 and 28.2 of the contract and applied for a twelve (12) months extension of time due to delayed payments. Further, the contractor had suspended road works in August 2016.

**d. Physical Inspection**

The physical inspections carried out in September 2016 revealed that only 10 km had been surface dressed out of the contracted 100 km. The road works had stalled due to lack of payments.

**46. Mpika – Nabwalya – Mfuwe Road (Lot 1)**

On 13<sup>th</sup> March 2014, RDA engaged China Henan International Cooperation to upgrade 118km of Mpika – Nabwalya – Mfuwe road (Lot 1) in Muchinga Province and remedying of any defects therein at a contract sum of K429,962,249 VAT inclusive with a contract completion period of thirty (30) months. The contract start date was 27<sup>th</sup> March 2014 while actual works commenced on 5<sup>th</sup> May 2014 and the contract completion date was 26<sup>th</sup> September 2016.

The scope of work included among other things, clearing of bush and vegetation, construction of selected road embankment layer, gravelling of sub-base and cement stabilization of gravel base layers, construction of new double seal bituminous surfacing extending over the shoulders in the selected sections, road markings and traffic signs, provisions of guard rails, ancillary works, installation of drainage structures and construction of two bridges.

As of December 2016, a total amount of K66,754,142 had been certified and a total of K22,395,420 had been paid to the contractor.

RDA also awarded a contract on 1<sup>st</sup> August 2014 to Messrs BARI Zambia Limited in association with Beza Consulting Inc. of USA to provide consultancy services for the design and supervision of the upgrading to bituminous standard of 235 km of the Mpika to Nabwalya to Mfuwe Road (Lot 1 and 2) at a total contract sum of K25,326,454 for a duration of forty (40) months.

As of December 2016, the consultant had been paid amounts totalling K8,164,329 leaving an outstanding balance of K7,208,697 in respect of eleven (11) fee notes.

The following were observed:

**a. Late Engagement of the Supervising Consultant**

The supervising consultant was engaged on 1<sup>st</sup> August 2014 while the works commenced on 5<sup>th</sup> May 2014 resulting in a delay of more than two (2) months.

**b. Lack of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor as of July 2016.

**c. Delayed Works**

Despite the project being under implementation for twelve (12) months, as of April 2016, the contractor had only achieved a progress of 9.45 percent against the targeted progress of 43.20 percent.

**d. Physical Inspection**

A physical inspection revealed the following:

- i. Construction of other site camp offices and accommodation were still under way as can be seen in the picture below.



*Construction works at the camp site for Mpika – Nabwalya Lot 1*

- ii. Clearing and grubbing, ripping, excavation, embankment fill from Km 0 + 000 to Km 4 + 800 representing 1 percent the physical progress were underway.
- iii. Earthworks of 7500 m<sup>3</sup> excavation and 5600 m<sup>3</sup> fill were completed at Km 0 + 500 as can be seen below.



*Clearing and Grubbing works along Mpika – Nabwalya Lot 1*

**47. Upgrading to Bituminous Standard of the Isoka – Muyombe – Chama – Lundazi Road: Lot 2: D790 (KM 90 +000) – M14 (Chire River) – (93 km) in Muchinga Province – Questionable selection of the Bidder.**

On 29<sup>th</sup> September 2014, RDA engaged China Civil Engineering Construction Corporation to upgrade 93 km of the Isoka – Muyombe –Chama-Lundazi Road to bituminous standards with double surface dressing at a contract sum of K396,624,924

with a completion period of twenty four (24) months. The commencement date was 13<sup>th</sup> October 2014.

As of December 2016, the contractor was paid K106,266,033.

Further, on 29<sup>th</sup> September 2014, Bari Zambia Limited in association with Voyants Solutions Pvt Limited was engaged as the consultant/supervisor for the project at a contract sum of K19,293,368 with a completion period of thirty (30) months.

The following were observed:

**a. Questionable Selection of Contractor**

The selection of the contractor was questionable in that despite various recommendations by the Evaluation Committee, the Procurement Committee rejected the recommendations and requested for a re-evaluation.

- i. On 12<sup>th</sup> December 2013, the evaluation committee recommended that the contract be awarded to Messer China Henan International Corporation Group Co. Limited at a sum of K358,904,679 VAT inclusive. The Procurement Committee deferred the authority to award the contract purportedly because the recommended bidder already had the minimum required contracts under Link Zambia 8000 and directed that a due diligence be conducted on the Plinth Technical Works Limited who was the second best bidder.
- ii. According to the Re-Evaluation Report dated 29<sup>th</sup> April 2014, a due diligence was carried out on Messrs. Plinth Technical Works Limited to ascertain the capability of the contractor to carry out the works and the bidder was reported to have no capacity to perform. Therefore, the Procurement Committee directed the Evaluation Committee to re-evaluate and conduct a due diligence on the third best bidder, Messrs. AVIC International Project Engineering Limited.
- iii. Following the re-evaluate and due diligence of Messrs. AVIC International Project Engineering Limited, the Evaluation Committee recommended that the contract be awarded to Messrs. AVIC International Project Engineering Limited at a contract sum of K382,051,062. However, the Procurement Committee directed that the evaluation report be revised since the bidder Messrs. AVIC International Project Engineering Limited already had two (2)

projects under Link Zambia 8000 and that the bidder had limited capacity as demonstrated on the Lusaka 400 (L400). Although AVIC International Project Engineering Limited indicated that they did not have more than one (1) project under Link Zambia 8000, Link Zambia 8000 was re-defined in a minute dated 30<sup>th</sup> June 2014, from the Acting Director and Chief Executive – RDA to the Director General – ZPPA to mean “All Road Projects with no exception” thereby disadvantaging AVIC International Project Engineering Limited.

- iv. Consequently, a re-evaluation was done and the Evaluation Committee recommended that the contract be awarded to Messrs. China Civil Engineering Construction Corporation Zambia Limited at a contract sum of K396,624,924 which was K37,720,245 more than the bid by the best evaluated bidder.

However, considering that the requirement to disqualify all contractors who had at least two (2) projects under the Link Zambia 8000 was in the instructions to the bidders, it was not clear why contractors who already had the maximum number of contracts under Link Zambia 8000 programme were subjected to a technical and financial evaluation.

**b. Failure to Pay Contractor on Time**

According to the contract, once a contractor’s claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

A review of the September 2016 progress report revealed that out of the advance payment of K29,746,869, the contractor had only been paid amounts totalling K19,831,246 despite the contractor having submitted the bank guarantee

In addition, as of December 2016, the RDA owed the contractor amounts totalling K18,569,844 in respect of unpaid IPCs which had been outstanding for more than twelve (12) months. At the time of the expiry of the contract on 12<sup>th</sup> October 2016, the overall physical progress of the project was 5.23 percent.

**48. Upgrading to Bituminous Standard of the Isoka – Muyombe – Chama – Lundazi Road: Lot 3: M14 (Chire River) - Chama (D103 Junction) (90 km) in Muchinga Province**

On 25<sup>th</sup> April 2014, RDA engaged AVIC International Project Engineering Limited to upgrade 90 km of the Isoka – Muyombe – Chama – Lundazi, Lot 3 at a contract sum of K332,824,438 with a completion period of twenty four (24) months.

As of December 2016, the contractor had been paid amounts totalling K23,454,424, and K6,938,195 was outstanding in respect of two (2) IPCs.

Further, on 29<sup>th</sup> September 2014, Bari Zambia Limited in association with Voyants Solutions Pvt Limited was engaged as consultant/supervisor of the project at a contract sum of K19,293,368 with a completion period of thirty (30) months.

The following were observed:

**a. Late Engagement of the Supervising Consultant**

The supervising consultant was engaged on 29<sup>th</sup> September 2014 while the works contract commenced on 8<sup>th</sup> May 2014 resulting in a delay of more than five (5) months.

**b. Lack of Progress on the Project**

A review of the September 2016 progress report revealed that on 30<sup>th</sup> December 2014, the contractor was paid K19,897,329 as advance payment. However, there was no tangible progress on the project in that the contractor's mobilisation was still below 50 percent and the physical progress was less than 6 percent as of October 2016.

**49. Upgrading and Re-alignment of D301 from Muyombe Junction to Chama (32 km) and Road from Chama to Luangwa River (42 km) including 12 km of urban Roads in Chama in Muchinga Province of Zambia – Lot 1**

On 30<sup>th</sup> November 2012, RDA engaged China Civil Engineering Construction Corporation (Zambia) Limited to upgrade and re-align D301 from Muyombe Junction to Chama (32 km) and the road from Chama to Luangwa River (42 km) including 12 km of urban Roads in Chama in Muchinga Province – Lot 1 at a contract sum of K371,478,276 and a completion period of twenty four (24) months.



As of December 2016, the contractor had been paid amounts totalling K179,888,902.

Eastconsult Limited was contracted for the consulting services for the design and supervision of the project on 4<sup>th</sup> January 2012 at a contract sum of K17,274,140.

As of December 2016, the consultant had been paid amounts totalling K7,073,891 while K1,940,267 was outstanding in respect of one (1) fee note.

**a. Unjustified Procurement Method – Direct Bidding**

According to the Public Procurement Act No. 12 of 2008, section 32, sub section 2

(i) – (v) direct bidding is only used in special cases such as:

- Goods, works or services are only available from a sing source and no reasonable alternative or substitute exists;
- Due to an emergency, there is need for works or services making it impractical to use other methods of procurement;
- Additional goods, works or services must be procured from the same source because of the need for compatibility, standardization or continuity;
- Where an existing contract could be extended for additional goods, works or services of a similar nature and no advantage could be obtained from further competition; and
- Where an estimated value of the goods, works and services does not exceed the threshold prescribed in the Public Procurement Regulations.

In a letter to ZPPA referenced RDAHQ/101/12/22 dated 13<sup>th</sup> June 2012, the RDA sought authority for a waiver from open bidding to limited bidding. In the letter, RDA shortlisted the following contractors:

- China Civil Engineering Construction Corporation
- Sable Construction Zambia Limited
- Raven Worx (Z) Limited

In unexplained circumstances, on 24<sup>th</sup> June 2012, RDA further applied for a waiver to directly bid (single source) China Civil Engineering Construction Corporation. Although in their letter dated 29<sup>th</sup> June 2012, ZPPA indicated that open bidding was unlikely to guarantee value for money, ZPPA still granted authority to single source.

The decision by ZPPA to authorise RDA to single source despite noting that the method of procurement was unlikely to guarantee value for money was questionable.

Further, correspondence dated 26<sup>th</sup> December 2012 from the contractor addressed to the RDA requesting for an advance payment revealed that the contractor had already commenced works. However, the commencement order certificate was only issued on 10<sup>th</sup> January 2013. This was contrary to Sections 15 and 54(2)a of the Public Procurement Act No. 12 of 2008 and the General Conditions of the Contract Section 21.1, which requires that the Client gives possession of all parts of the site to the Contractor.

**b. Irregular Appointment of Subcontractors without Capacity**

RDA has a policy of improving the capacity of local road contractors by assigning them as subcontractors to bigger contractors who are expected to build capacity in the local contractors. In this regard, RDA nominated among other sub-contractors, Nakangeya Construction and Mukaka constructions to lay the sub-base and double seal.

However, no evidence was made available for audit to show that the nomination of any of these subcontractors preceded a competitive selection process. It was also observed during a physical inspection that the two sub-contractors who were nominated by RDA, namely Nakangeya Construction and Mukaka constructions abandoned works in July 2014 as they failed to do the double seal, but only did the sub base.

**c. Physical Inspections**

A physical inspection of the road revealed the following:

**i. Stabilised Base Coring / Trial Pit**

• **Muyombe Junction to Chama (32 km)**

- At Km 2+810 RHS, the average core thickness retrieved was 100 mm.
- At Km 1+000 LHS, the average core thickness retrieved was 120mm.

- At Km 0+810 LHS, the average core thickness retrieved was 107mm.
- At Km 20+300 RHS, core crumbled.
- At Km 10+300 LHS, core crumbled.
- At Km 5+100, core crumbled.
- At Km 0+360, core crumbled.

The cores retrieved did not meet the 150 mm thickness or 123 mm minimum thickness as per SATCC clauses 3405 and 7205



*Crumbled cores*

- **12 km of Urban Roads in Chama**

At Km 0+200 LHS, the average core thickness retrieved was 110 mm. The cores retrieved did not meet the 150 mm thickness or 123 mm minimum thickness as per SATCC clauses 3405 and 7205

- **Airport Road Link Base Coring**

- At Km 0+120 RHS, three (3) cores crumbled.
- At Km 2+500 RHS, the average core thickness retrieved was 122 mm.

- **Chama Matumbo Road**

- At Km 0+200 RHS, no core was retrieved. The average base thickness measured from the trial pit was 150 mm.
- At Km 5+200 LHS, no core was retrieved. The average base thickness measured was 165 mm.

- At Km 10+500 RHS, core retrieved, some semblance of cement was observed. Thickness of core was 120 mm. The average thickness measured from the trial pit was 145 mm.
- At Km 14+900 LHS, the average base thickness measured from the trial pit was 150 mm.
- At Km 20+200 RHS, the average base thickness measured from the trial pit was 165 mm.
- At Km 25+200 LHS, core retrieved. Thickness of core was 125 mm. The average base thickness measured from the trial pit was 145 mm.
- At Km 30+200 RHS, core retrieved, some semblance of cement was observed. Thickness of core was 130 mm. The average base thickness measured from the trial pit was 150 mm.
- At Km 35+200 LHS, core retrieved. Thickness of core 150mm. The average base thickness measured from the trial pit was 180mm.
- At Km 40+200 RHS, the average base thickness measured was 180 mm.

**ii. Visual Inspections**

There were potholes and rutting at the main roundabout. See picture below.

- The road markings were faded,
- There were no road signs for humps,
- The drainage pipe of 200 mm was too small for self-cleansing and maintenance at the roundabout, and
- Some cracks have been sealed and a core drilled on a crack revealed that the cracks were propagating through the base.



*Potholes and rutting at the roundabout has not yet been repaired.*

- **Muyombe Junction to Chama**

- There was a visibly poorly constructed joint for 600 mm.
- The road surfacing was peeling away due to poor adhesion of the road surfacing and road base.



Cracking was observed in selected portions from Km 15,

- Cracks were observed to be within 2 m from the edge on both sides of the edge,
- Some cracks had been sealed and a core drilled on the crack revealed that the crack was propagating through the base



**50. Upgrading and Re-alignment from Great North Road at Matumbo to Luangwa Bridge (115 km Road – Lot 2)**

On 30<sup>th</sup> November 2012, RDA engaged China Jiangxi Corporation for International Economic and Technical Corporation to upgrade and re-align the Matumbo to Luangwa Bridge Road in Muchinga Province (Lot 2) at a contract sum of K466,731,196 VAT inclusive with a completion period of thirty six (36) months.

The contract start date was 14<sup>th</sup> December 2012 with an initial completion date was 14<sup>th</sup> December 2015 which was revised to 14<sup>th</sup> December 2016.

As of December 2016, the contractor had been paid amounts totalling K90,078,758.

On 4<sup>th</sup> January 2013, RDA engaged Zulu Burrow Development Consultants Limited to provide design and supervision services at a contract sum of K15,237,760.

As of December 2016, the consultant had been paid amounts totalling K2, 801,285.

The following were however observed:

**a. Direct Bidding / Single Sourcing of the Contractor and Consultant**

Section 32(2) of the Public Procurement Act states that a procuring entity may use direct bidding, where—

- i. The goods, works or non-consulting services are only available from a single source and no reasonable alternative or substitute exists,
- ii. Due to an emergency, there is urgent need for the goods, works or services making it impractical to use other methods of procurement because of the time involved in using those methods,
- iii. Additional goods, works or services must be procured from the same source because of the need for compatibility, standardization or continuity,
- iv. An existing contract could be extended for additional goods, works or services for a similar nature and no advantage could be obtained by further competition, or
- v. The estimated value of the goods, works or services does not exceed the prescribed threshold.

On 24<sup>th</sup> June 2012, the RDA requested the ZPPA for a waiver from open bidding to direct bidding of China Jiangxi Corporation for International Technical and Economic Corporation Limited for the road works and Zulu Burrow Zambia Limited for the road design and supervision consultancy and the waiver was granted on 29<sup>th</sup> June 2012.

However, the single sourcing was questionable as it did not meet the criteria required as stated above.

**b. Lack of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor as of August 2015.

**c. Failure to Pay Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within fifty six (56) days failure to which the contractor is entitled to charge interest on the outstanding claim.

The contractor suspended works in April 2014 due to delays in approving the road designs and non - payment of claims. As of December 2016, RDA owed the contractor amounts totalling K49,898,285 in respect of four (4) certified IPCs resulting in the contractor charging interest in amounts totalling K10,423,751.

In addition, as of December 2016, the consultant was owed amounts totalling K3,074,877 in respect of eight (8) fee notes.

**d. Physical Inspection**

A visual inspection carried out to check the quality of the works revealed that the contractor had done earth works of 53 km while only 24 km of the road had been tarred. In addition, despite the contractor having been paid for standard temporary signs, unconventional temporary signs were installed as shown in the picture below.



*An unconventional temporary sign*

## **SOUTHERN PROVINCE**

### **51. Rehabilitation to Bituminous Standard of the D387 Road from T1 to Chikankata**

On 27<sup>th</sup> February 2015, RDA engaged Inyatsi Roads Zambia Limited to rehabilitate 32 km of the D387 road from T1 to Chikankata at a contract sum of K48,622,764 VAT inclusive with a completion period of twelve (12) months. The commencement date was 30<sup>th</sup> March 2015 with a completion date of 29<sup>th</sup> March 2016.

On the 7<sup>th</sup> September 2015, RDA also signed a design review and supervision contract with ASCO (Z) Limited at a contract sum of K7,075,768 for a duration of fourteen (14) months. As of December 2016, the contractor had been paid amounts totalling K5,862,276

The scope of works included bush clearing, construction of new double seal bituminous, road markings and traffic signs, provision of guard rails, ancillary work and installation of drainage structures and construction of two (2) bridges.

The following were observed:

#### **a. Failure to Engage Supervising Consultant on Time**

Standard contract administration requires the supervising consultant to be appointed before the contractor for works. During the pre-contract meeting between RDA and the contractor on 13<sup>th</sup> August 2014, concern was raised by the contractor as to whether the consultant had already been appointed to which RDA stated that the contract would be signed at the same time as that of the consultant.

It was however observed that despite the works having commenced on 30<sup>th</sup> March 2015, the consultant was only appointed on 7<sup>th</sup> September 2015.

As a result of the RDA's failure to engage a consultant at the beginning of the project, it was observed that contrary to clause 16.1 and clause 44.1(c) of the works contract which required the contractor to construct and install the works in accordance with the specifications and drawings, RDA failed to provide the drawings to the contractor.

As of December 2016, nine (9) months after the commencement of the contract, the drawings had not been availed to the contractor.



**b. Failure to Pay Contractor on Time**

The contractor was paid the advance payment on 23<sup>rd</sup> March 2015. However, contrary to Clause 43.1 which required the contractor to be paid within fifty six (56) days of the date of each certificate, the RDA had not paid the contractor interim payment certificates number 2 to 6 totalling K7,331,417. During the period from December 2015 to September 2016 the works had stalled due to non-availability of construction information and none payment of certified works.

**c. Interest Penalty Charges on Delayed Payments**

According to clause 43.1 of the General Conditions of Contract which states that, “if the employer makes a late payment, the contractor shall be paid interest on the late payment in the next payment.” In this regard, as December 2016, the contractor claimed interest in amounts totalling K2,073,390 due to the failure by the RDA to settle IPCs on time.

**d. Failure to Renew Bank Guarantee**

Contrary to the requirements of the contract, the bank guarantee which expired on 27<sup>th</sup> February 2015 had not been renewed as of September 2016.

**52. Rehabilitation of 40 km of Selected Livingstone City Roads**

On 13<sup>th</sup> November 2012, RDA engaged Inyatsi Roads Zambia Limited to rehabilitate 40Km of selected roads in Livingstone in Southern Province at a contract sum of K118,441,534 VAT inclusive with a completion period of eight (8) months. The contract price was varied upwards to K234,482,742. The contract start date was 27<sup>th</sup> November 2012 and the initial completion date was 31<sup>st</sup> July 2013.

Further, in March 2013, RDA signed a consultancy contract with Brian Colquhoun Hugh O’Donnel and Partners at a contract sum of K1,903,862 VAT inclusive. The consultant’s scope of works was for the design review and construction supervision of the works.

As of December 2016, the consultant had been paid amounts totalling K1,206,363 while the contractor was paid amounts totalling K218,454,733.

The following were observed:

**a. Late Engagement of the Supervising Consultant**

The supervising consultant was engaged in March 2013 while the works commenced on 27<sup>th</sup> November 2012 resulting in a delay of more than three (3) months.

**b. Lack of Detailed Road Engineering Designs**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor at commencement of works.

As a result of the absence of detailed road engineering designs, on 11<sup>th</sup> December 2012, the contract was varied by K7,698,700 VAT inclusive bringing the contract sum to K126,140,233 to enable the contractor to provide the designs.

**c. Irregular Variations of Scope of Works**

Clause 39- Variations – sub-clause (1) of the General Conditions of Contract (GCC) states that “all variations shall be included in updated programs produced by the contractor. All variations issued by the Project Manager shall not exceed 25% of the initial contract price, except with the prior approval of the employer.

On 8<sup>th</sup> November 2012, the Attorney General wrote to RDA stating that the draft contract for the rehabilitation of selected roads in Livingstone City was satisfactory. In this regard, it was cleared for execution subject to the following concern being addressed, among others.

“As is the practice, Clause 39.1 should be qualified by inserting the following wording: All variations shall not exceed 25 percent of the contractual price.”

In this regard, the variations in the scope of works amounting to K116,041,208 representing 98 percent of the original contract price of K118,441,534 were irregular as they exceeded the allowed limit of 25 percent.

**d. Physical Inspection**

**i. Botswana Road**

- At Km 0+050 LHS, no core retrieved. Core crumbled.

- At Km 1+400 LHS, no core retrieved. Core crumbled. The concrete on the Dip was disintegrating and potholes were forming.
- At Km 1+400 LHS, rutting of 12mm under a 3m straight Edge was measured contrary to the requirements of SATCC 4212 CONSTRUCTION TOLERANCES. Water was coming from potholes and it was attributed to a SWASCO burst pipe. DCP was undertaken to evaluate the strength of the pavement.
- At Km 3+400 LHS, core crumbled.

**ii. Balewa road**

- At Km 0+100 LHS, core crumbled. The road markings were faded and needed to be re-established after the maintenance period in accordance with SATCC clause 5514 item 55.07.
- At Km 0+1000 RHS, core crumbled. The concrete on the Dip was poorly designed affecting smaller vehicles, it was repaired unconventionally by adding more concrete but was failing contrary to requirements SATCC 1218 remedial works.
- At Km 0+1000, poor drainage design leads to flooding of houses around the area during the rainy season creating a hazard to the public contrary to the requirements of SATCC clause 6.1 Geometric Design Standards DRAINAGE.
- At Km 0+1600, dambo area with poor design leading to base failure. Area with SWASCO pipes.
- At Km 0+1900, dambo area with poor design leading to base failure.

**iii. Mandela Road**

- At Km 0+000 LHS, no core retrieved. Core crumbled
- At Km 0+000 LHS, surface irregularity /rutting under a 3 meter straight edge was measured to be 18mm contrary to the requirements of SATCC 4212
- At Km 0+000 LHS, no core retrieved. Core crumbled



*Crumbled Core*



*Rutting of 12mm under a 3m straight Edge*



*Area prone to water logging with poor design leading to base failure*



*Poor drainage design*



*The concrete on the Dip was poorly designed affecting smaller vehicles, it was repaired unconventionally*



*Area prone to water logging with poor design leading to base failure*



*Area prone to water logging with poor design leading to base failure*

### 53. Poor Design of Kazungula Weigh Bridge Driveway

On 14<sup>th</sup> April 2008, Road Development Agency (RDA) awarded a contract to Fair Face Enterprises to execute construction of additional works for the construction of Kazungula Weigh Bridge in Southern Province at a contract price of K3,494,716 VAT inclusive for duration of three (3) months. The contract price was later varied to K9,571,920.

The rehabilitation works consisted of construction of shoulders to driveways and parking bays; erection of lighting mast and other electrical fittings; painting to weighbridge house and offices and sign writing; construction of side and mitre drains; construction of passing lanes; installation of road signs and road line marking; construction of retaining wall; landscaping works to areas around the weighbridge house and surrounding areas; connection of new water reticulation to council line; and finishes to the generator house.

The site was handed over by the employer on 23<sup>rd</sup> October 2008. The consultancy contract signed with Zulu Burrow limited commenced on 30<sup>th</sup> September 2008 at a cost of K411,012.

As of December 2016, the contractor was paid K9,163,647 and the consultant K380,155.

Although the works had been completed and the project was beyond the defect liability period, a physical inspection conducted in May 2015 revealed that the concrete works undertaken were of poor quality and spalling (worn out) resulting into potholes that developed on the carriage way as can be seen below.



*Worn out driving surface at Kazungula Weighbridge*

The carriage way on the weigh bridge was reinforced with conforce wire instead of adequate reinforcement bars such as 16 mm reinforcement bars. In general, the design was poor and could not withstand the stress of heavy duty vehicles.



*Poorly constructed carriageway reinforced with conforce wire*

In their response management stated that the initial contractor was Turner Construction Limited Company whose contract was terminated due to poor workmanship and the original design by the supervising consultant Bicon Zambia Limited used conforce 257 mesh reinforcement.

However, RDA engaged Zulu Burrow Consulting Limited who reviewed the original design and recommended the use of Y12 reinforced bars, the design was never changed to use Y12 reinforced bars.

In addition, apart from terminating the contract with Turner Construction, there was no evidence that any other action was taken against the consultant despite the poor design done.

#### **54. Rehabilitation and Upgrading of the Monze – Niko Road (71 km)**

On 15<sup>th</sup> May 2014, RDA engaged Unik Construction Engineering (Z) Ltd/Buildcon Investments Limited Joint Venture to rehabilitate and upgrade the Monze – Niko (D365) road in Southern Province to bituminous standard and the remedying of any defects therein at a contract price of K229,969,700 VAT inclusive with a contract completion period of twenty four (24) months. The site was handed over on 24<sup>th</sup> June 2014 and the contractor commenced works on 9<sup>th</sup> July 2014.

As of December 2016, the contractor had been paid amounts totalling K45,488,774.

The RDA engaged East Consult Limited in Association with Dasan Consultant to provide the detailed design and supervisory services. The consultancy started on 3<sup>rd</sup> September

2013 and the supervision services commenced on 4<sup>th</sup> August 2014 at a contract sum of K13,729,412. As of December 2016, the consultant had been paid amounts totalling K1,241,316.

The scope of work consisted of the following:

- Clearing and Grubbing,
- Roadbed preparation,
- Construction of fill layers,
- Construction of pavement layers,
- Construction of fill layers,
- Construction of drainage works,
- Double Surface Dressing with 19/9.5mm, and
- Signage.

The following were observed:

**a. Lack of Detailed Engineering Drawings**

Standard Engineering practice requires that detailed road engineering designs which include pavement and geometric designs, environmental management, drawings and estimated construction costs are supposed to be in place before tendering and construction. In order for the contractors to be able to execute works correctly, RDA is required to provide them with detailed road engineering designs.

Further, the signed contract stated that the detailed road engineering designs would form part of the contract. However contrary to this clause RDA did not provide the contractor with detailed road engineering designs at the commencement of works.

A review of progress reports revealed that, although the works contract commenced in July 2014, the draft design report was submitted to RDA after August 2014 and as of September 2016, the RDA did not avail the final design for verification.

**b. Failure to Pay Advance Payment on Time**

Contrary to the contract which required that the employer makes advance payments to the contractor upon provision of an unconditional bank guarantee /insurance bond, the RDA failed to pay the contractor the advance payment of K22,996,970 in



full despite the contractor submitting the required documents. As of December 2016, an amount of K2,424,042 of the advance was still outstanding.

**c. Failure to Pay Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

As of December 2016, the RDA owed the contractor amounts totalling K19,403,768 in respect of three (03) unpaid IPCs.

In addition the consultant was owed amounts totalling K3,399,385 as of December 2016.

**d. Physical Inspection - Communication/Electricity Service Cables**

At Km 70+984, the road was constructed under power/communication lines with inadequate height clearance. See picture below.



*Utility cable with low clearance*

**55. Upgrading to Bituminous Standard of 107.5 Km of the Bottom Road (RS19, RS 7 and RS5) From Chaboboma via Sinazeze to Sinazongwe in Southern Province - Lot 2**

On 30<sup>th</sup> September 2014, RDA awarded a contract to Stefanutti Stocks Construction Zambia Limited for upgrading of 107.5 km of the Bottom road (Lot 2) to bituminous standards from Chaboboma via Sinazeze to Sinazongwe in the Southern Province at a contract sum of K592,500,000 with a completion period of twenty four (24) months.



The scope of works included excavation, grading and other earth works, road paving and surface sealing, reinforced concrete, bridge and culvert construction and speed/warning road signage and publicity sign boards.

As of December 2016, the contractor had been paid amounts totalling K43,235,504 leaving nine (9) unpaid certified IPCs totalling K186,955,829.

However, the following were observed:

**a. Failure to Appoint a Consultant on Time**

Contrary to normal contract administration of having a consultant on site at commencement of construction works, the RDA did not appoint a supervising consultant as at 1<sup>st</sup> June 2015. While the contractor was contracted on 30<sup>th</sup> September 2014, the supervising consultant had not been contracted by 1<sup>st</sup> June 2015, a delay of eight months.

**b. Lack of Engineering Design**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor as of June 2015.

**c. Delayed Advance Payment**

The contractor had claimed an advance payment of K44,437,500 out of which only K6,000,000 was paid in May 2015. In this regard, the contractor was claiming both an increase in the contract price and an extension of the completion period.

**d. Failure to Commence Works on Time**

On 18<sup>th</sup> November 2014, RDA issued a commencement order to Stefanutti stocks Construction to commence works.

However, the contractor only mobilised on 30<sup>th</sup> September 2015, ten (10) months after the commencement order was issued.

A review of the Progress Report No.11 of November 2016 revealed that progress on the works was at 11 percent.

**56. Rehabilitation of 131.5 km of the Bottom roads Lot1: Munyumbwe to Chaanga to Njami D00/501) in Southern Province**

On 15<sup>th</sup> July 2011, RDA engaged China Henan International Cooperation to rehabilitate 131.5 km of the bottom roads Lot 1(Muyumbwe to Chaanga to Njami D00/501) in Southern Province at a contract sum of K197,742,202 with a completion period of twenty four (24) months.

The initial proposed intervention on this project was a gravel surface finished road over a stretch of 131.5 km. This scope was later changed to bituminous surface road.

This change in intervention and inclusion of other variations resulted in an increase in the contract sum from K197,742,202 to K332,939,624.

Works commenced on 29<sup>th</sup> August 2011 with a revised completion date of 27<sup>th</sup> November 2015.

As at 31<sup>st</sup> December 2016, the contractor had been paid amounts totalling K59,814,368 However, the following were observed:

**a. Failure to Pay Contractor on Time**

According to the Contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

As of December 2016, the RDA owed the contractor amounts totalling K121,806,864 in respect of twelve (12) unpaid IPCs.

**b. Physical Inspection**

During the physical inspection the following observations were made:

**i. Pavement - Stabilised Base Coring / Trial Pit**

Out of fifteen (15) cores drilled, eleven (11) cores crumbled. See details below.

- At Km 0+700 LHS, the average core thickness retrieved was 75 mm.
- At Km 11+100 RHS, the average core thickness retrieved was 100 mm. In the trial pit, the base was measured to be 125 mm thick
- At Km 20+200 LHS, three (3) cores crumbled. In the trial pit the base was measured to be 107 mm thick

- At Km 30+200 RHS, crumbled core. In the trial pit the base was measured to be 135 mm thick.
- At Km 40+200 RHS, crumbled core. In the trial pit the base was measured to be 200 mm thick.
- At Km 50+200 LHS, crumbled core. In the trial pit the base was measured to be 140 mm thick
- At Km 60+000 LHS and RHS, the average core thickness retrieved was 67 mm. In the trial pit the base was measured to be 127 mm thick
- At Km 60+000 LHS, core crumbled. In the trial pit the average base thickness 140 mm and subbase thickness is 150 mm.
- At Km 70+000 RHS, core retrieved. The Average core thickness retrieved was 90 mm. In the trial pit the base was measured to be 170 mm thick and subbase was measured to be 85 mm.
- At Km 80+000 LHS, core crumbled. In the trial pit the base was measured to be 130 mm thick and subbase was measured to be 100 mm.
- At Km 90+000 RHS, no core retrieved. In the trial pit the base was measured to be 150 mm thick and subbase thickness measured was 100 mm.
- At Km 100+000 LHS, core retrieved. The average core thickness retrieved was 50 mm. In the trial pit the base was measured to be 170 mm thick and the subbase was measured to be 0 mm.
- At Km 110+000 RHS, no core retrieved. The average core thickness retrieved was 0 mm. In the trial pit the base was measured to be 120 mm thick. Subbase thickness was measured to be 70 mm.
- At Km 120+000 LHS, no core retrieved. The average core thickness retrieved was 0 mm. Core crumbled. In the trial pit the base was measured to be 205 mm thick and subbase thickness was measured to be 90 mm.

- At Km 130+000 RHS, no core retrieved. The average core thickness retrieved was 0 mm. In the trial pit the base was measured to be 200 mm and subbase thickness was measured to be 0 mm.



*Failed core*

**ii. Surface Irregularity – 3 m Straight Edge - Surface irregularity**

- At Km 0+700, on the new seal measuring 16 mm LHS and 14 mm RHS. The average rutting was greater than 25 mm when measured under a 3 m straight edge contrary to the requirement of maximum of 10 mm under clause 4212 CONSTRUCTION TOLERANCES. The Rutting indicates the road surfacing has structurally completely failed. The rutting on the new road was greater than the existing old road
- At Km 70+200, culvert had no headwalls

**WESTERN PROVINCE**

**57. Construction of a Bridge across the Zambezi River at Sioma / Maziba Bay Crossing in Senanga / Shangombo Districts of Western Province**

On 9<sup>th</sup> June 2011, RDA engaged China Henan International Cooperation Group Co. Ltd to construct a bridge across the Zambezi River at Sioma / Maziba Bay in Senanga/Shangombo district of Western Province at a contract sum of K74,043,248 VAT inclusive which was revised to K143,200,870. The contract period was from 1<sup>st</sup> May 2013 with an initial end date of 28<sup>th</sup> February 2015 which was later revised to 13<sup>th</sup> April 2016. As at 31<sup>st</sup> December 2016, the contractor had been paid amounts totalling K30,544,010

On 12<sup>th</sup> May 2011, RDA engaged UWP Consulting to provide consultancy services for the design review, preparation of detailed engineering design and construction supervision of the project at a contract sum of K6,260,502 VAT inclusive with a contract duration of four (4) months. The contract for the consultant was terminated in 2012 due to non - performance. In this regard, in May 2014, E.G Petit and Partners Consulting Engineers was engaged at a contract price of K7,236,225 to provide consultancy services. As of December 2016, E.G Petit and Partners Consulting Engineers had been paid amounts totalling K10,166,349 leaving three (3) unpaid certified IPCs amounting to K3,081,039.

The scope of works included among other things:

- **Bridge Structure**

Construction of pile foundations; Concrete works for Bridge abutments, piers and approach slabs; Pre-stressed concrete works for the superstructure concrete box girder deck; Erosion protection works; Ancillary works, such as road marking, road signs.

- **Approach Roads**

Clearing and grubbing of the proposed approach road; Mass earthworks including cut-to-fill, borrow-to-fill and cut-to-spoil; Preparation of roadbed and road formation; Construction of selected subgrade layer; Construction of chemically stabilized sub base layer; Storm water drainage works; Double seal surface dressing; Ancillary works, such as road marking, road signage and guard rails; Erosion protection works

As of May, 2015 overall work progress was estimated at approximately 51% with concrete works for pile caps at pier 1 and 2 completed , grouted rock fill around pile caps completed

The following were however observed:

- a. **Delay in Awarding of Supervision Contract**

E.G Petit irregularly rendered supervisory services on the Sioma Maziba Bridge in that the consultant commenced works before awarding and signing of the contract.

A scrutiny of the contract document revealed that E.G Petit was engaged on 2<sup>nd</sup> May 2014 which was twenty four (24) months after the works had commenced.

**b. Failure to Insure Motor Vehicle Comprehensively and Delayed Replacement**

Contrary to the contract which required that all the motor vehicles be insured comprehensively in the name of RDA, it was observed that the contractor had insured all the project vehicles with third party insurance.

Consequently, as of December 2016, the contractor did not replace a Motor Vehicle Registration No. ALL 4781 which was involved in a road accident in October 2014.

**c. Failure to Pay Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days failure to which the contractor is entitled to charge interest on the outstanding claim.

As a result of the failure to settle the IPCs on time, during the period from April 2015 to May 2015, the contractor suspended works on two (2) occasions. As of December 2016, the RDA owed the contractor amounts totalling K49,981,931 in respect of five (5) unpaid IPCs.

As of April 2015, the project was behind schedule by three (3) weeks as the contractor had to wait for payments in order to procure the required materials for the construction works. The actual physical progress was at 50 percent against the targeted physical progress of 65.6 percent.

This resulted in the project duration being extended by 410 days (approximately 14 months) with unplanned added costs arising from price adjustments and the contract price increasing by 32.3 percent.

**58. Periodic Maintenance of 87.2 km of Kaoma – Mongu (M009) Road from Tateyoyo (Kafue National Park West Gate) to Katunda/Lukulu Road in Western Province: Lot 1**

On 30<sup>th</sup> August, 2012, the Road Development Agency and China Jiangxi Corporation for International Economic and Technical Cooperation signed contract No. RDA/CE/026/011 for the periodic maintenance of Kaoma – Mongu (M9) Road (87.2Km) from Tateyoyo (Kafue National Park West Gate) to Katunda/Lukulu Road junction in

Western Province at a contract sum of K31, 662,253.41 VAT exclusive with a completion period of ten (10) months.

The contract start date was 12<sup>th</sup> September, 2012 and initial completion date was 12<sup>th</sup> July, 2013. The extended completion date for the project was 24<sup>th</sup> February, 2014.

The Road Development Agency signed a consultancy contract with Eastconsult in Joint Venture with Gladstone Engineering Consultants for a contract sum of K3, 843,950.00 on 18<sup>th</sup> January, 2013. The consultant's scope of works was for the supervision of the periodic maintenance of Tateyoyo Gate to Katunda/Lukulu Junction and Katunda/Lukulu Junction to Mongu (M009 Road) in Western Province (263Km).

The following were however observed:

**a. Late Engagement of the Supervising Consultant**

The supervising consultant was engaged on 18<sup>th</sup> January 2013 while the works commenced on 12<sup>th</sup> September 2012 resulting in a delay of more than seven (7) months.

**b. Incomplete Works at Closure of Contract**

On 20<sup>th</sup> May 2014, more than two (2) months after the extended contract completion period of 24<sup>th</sup> February 2014, RDA requested for tender authority through Variation Order No. 2, to revise the scope of works for the project by changing the intervention from periodic maintenance to rehabilitation at an additional cost of K434,949,811 bringing the revised contract sum to K488,674,321 (VAT inclusive).

On 21<sup>st</sup> May 2014, the RDA Procurement Committee rejected the request to revise the scope of works for Lot 1 by changing the intervention from periodic maintenance to rehabilitation and extend the contract duration for an additional twenty seven (27) months from 24<sup>th</sup> February 2014 to 24<sup>th</sup> May 2016 at an additional cost of K434,949,811 VAT inclusive.

The Procurement Committee instead directed a new procurement process to select a contractor to carry out the required rehabilitation works.

A physical inspection conducted in May 2015 revealed that a 4.68 km stretch

comprising two sections in the dambo areas from Km 7+380 to Km 8+820 and Km 69+020 to Km 72+260 was still un-surfaced more than one year after the tarmac was removed. See picture below.



*Un-surfaced Portion*

**c. Unsettled Final Account at Closure of Contract**

On 11<sup>th</sup> June 2014, the RDA instructed the consultant through a letter captioned Closure of Contract for Lot 1 to prepare the final account.

The consultant submitted a revised IPC No. 13 (Final Account) dated 17<sup>th</sup> October 2014 in amounts totalling K29,656,665. As of October 2016, the amount had not been settled.

**NORTH-WESTERN PROVINCE**

**59. Rehabilitation of the Solwezi Weigh Bridge Phase II in North Western Province**

On 28<sup>th</sup> January 2015, RDA engaged Savenda Management Services Limited to rehabilitate the Solwezi Weighbridge Phase 2 at a contract sum of K16,155,684 VAT inclusive which was revised to K19,850,357. The contract's commencement date was 23<sup>rd</sup> March 2015 with a completion date of 22<sup>nd</sup> October 2015 which was later extended to 22<sup>nd</sup> August 2016.

The RDA also signed a design review and supervision contract with LNH Consulting Services Limited in association with BNC Consult Limited on 29<sup>th</sup> April 2015 at a contract sum of K1,139,468 which was revised upwards to K1,306,573.

The scope of works included construction of;

- i. The detention bay and associated parking.
- ii. Access roads to the weighbridge



- iii. Bus and filter lanes of the T5
- iv. Refurbishment of the existing weighbridge building and house
- v. Houses for relocated families
- vi. Landscaping of the weighbridge area
- vii. Side and mitre drains.

As of December 2016, the contractor had been paid amounts totalling K3,416,634.

The following were observed:

**60. Periodic Maintenance of 136.6 km of the T005 Solwezi to Mwinilunga Lot 1 from Solwezi River Junction**

On 14<sup>th</sup> April 2014, RDA engaged Inyatsi Roads Zambia Limited at a contract sum of K140,234,535 for the periodic maintenance of 136.6 km of the T005 Solwezi to Mwinilunga Lot 1 with a commencement date of 28<sup>th</sup> April 2014 and completion date of 3<sup>rd</sup> December 2015.

As at 31<sup>st</sup> December 2016, a total amount of K133,543,119 had been paid to the contractor.

As of December 2016, the contractor had been paid amounts totalling K3,416,634.

The following were observed:

**a. Failure to Issue Detailed Engineering Drawings on Time**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor at the commencement of works on 23<sup>rd</sup> March 2015. The drawings were only provided on 24<sup>th</sup> April 2015.

**b. Failure to Avail the Evaluation Report**

RDA failed to avail the evaluation report for the best evaluated bidder for the rehabilitation of the Solwezi weighbridge in North-Western Province, but instead availed the evaluation report for 2008 when Mango Tree Construction Ltd was evaluated as the best bidder and awarded the contract.

**c. Failure to Renew Works and Consultancy Contracts**

It was observed that the contract for the works expired on 22<sup>nd</sup> August 2016 while the consultancy contract expired on 12<sup>th</sup> July 2016. However, despite the contractor and the consultant being on site, both contracts had not been renewed as of December 2016.

**d. Failure to Pay the Contractor**

On 3<sup>rd</sup> September 2014, RDA also signed a supervision contract with Brian Colquhoun Hugh O'Donnell and Partners at a contract sum of K13,761,815 VAT inclusive.

As at 31<sup>st</sup> December 2016, the consultant had been paid amounts totalling K2,905,761 leaving amounts totalling K941,044 in respect of four (4) fee notes.

The scope of works included:

- Shoulder construction, edge repairs and shoulder defects and pothole patching
- Reconstruction of failed sections,
- Clearing and grubbing, and
- Surface dressing consisting of double seal on the main carriage way and single seal on the shoulders, and asphalt surfacing on selected roads in Solwezi town.

The following were observed:

**a. Late Engagement of the Supervising Consultant**

The supervising consultant was engaged on 3<sup>rd</sup> September 2014 while the works contract commenced on 28<sup>th</sup> April 2014 resulting in a delay of more than four (4) months.

In a letter dated 2<sup>nd</sup> June 2014, the RDA North Western Regional Manager was appointed supervisor of the project due to lack of an appointed supervising consulting firm. However, in an internal memorandum dated 21<sup>st</sup> August 2014, management submitted to the Procurement Committee that there was urgent need to appoint a supervising consultant as the RDA staff had no survey equipment and design software to provide the required designs and reviews.

**b. Failure to Pay Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

As of December 2016, the contractor was owed amounts totalling K7,546,175 in respect of four (4) IPCs. Consequently, the contractor claimed interest amounting to K4,482,875 on IPC No. 11.

**c. Physical Inspection**

During the physical inspection using a three (3) meter Straight Edge, there were surface irregularities at Km 39+000 LHS longitudinal and Km 49+000 LHS longitudinal between the shoulder and the existing road. In addition, there was poor construction joint between the seals and pavement.

The average rutting was greater than 25 mm when measured under a three (3) meter straight edge contrary to the requirement of maximum of 10mm.

**61. Periodic Maintenance of 169 km of Road T005 from Solwezi to Chingola**

On 10<sup>th</sup> January 2013, RDA engaged Roads and Paving Zambia Limited for the periodic maintenance of 169 km of T5 from Solwezi to Chingola at an initial contract sum of K70,767,718 which was revised to K217,346,452. The contract period was estimated at twelve (12) months.

Further, on 8<sup>th</sup> May 2013, a design review and supervision services contract was signed with Rankin Engineering Consultants at a contract sum of K8,457,693.

The scope of works included pothole patching, selected reconstructions with double surface dressing, single seal on pothole patched sections and drainage works.

As of December 2016, the contractor had been paid amounts totalling K17,201,440.

The following were observed:

**a. Delayed Intervention Resulting in Wrong Interventions**

The scope of works included clearing and grabbing, drainage works, reconstruction for 57 km of road, pothole patching (deep and shallow), shoulder and edge repair, bituminous resurfacing with slurry seal, road markings/furniture and Solwezi junction works.

A review of Internal Audit Reports and other internal memos revealed that in December 2011, the RDA Regional Office for North-Western Province submitted to RDA Planning Department the initial scope of works on the Chingola – Solwezi Road for clearance and placement in the National Print Media. However, the procurement process was only completed on 10<sup>th</sup> January 2013, fourteen (14) months later when the contract with Roads and Paving Zambia Limited was signed. The delayed implementation of interventions led to further deterioration of the road in terms of scope of works.

Further, a scrutiny of the BOQ and the submission originally proposed by the Regional Office revealed that in addition to the delayed implementation of the works, the scope of works was scaled down without justification. In this regard, the following were observed:

- Item B34.01 reduced from 24 km reconstruction to 12 km of reconstruction;
- Item 49.03 reduced from 79,852 m<sup>3</sup> to 3,349 m<sup>3</sup> quantities for shoulders repairs
- Item 42.02 seal quantities reduced from double seal to single

A scrutiny of Progress Report No. 19 issued on 15<sup>th</sup> November 2014 revealed that the physical progress of the maintenance works achieved as at the date of termination on 29<sup>th</sup> August 2014 was 98 percent. As of December 2014, works worth K54,448,727 of had been certified out of which K17,201,440 was paid for civil works.

However, during the audit inspection of the road in May 2015, it was not possible to inspect works done and paid for under this contract because the road was characterised by non-usable shoulders, massive edge breaks and extended sections without bituminous layers. Further, mining companies operating in North-Western Province were trying to make the road usable by turning it into a gravel road.

It was observed that following the termination of the contract with Roads and Paving Zambia Limited new contracts were signed with China Geo Engineering Corporation Southern African Limited and Buildcon Investments Limited for rehabilitation works on the 169 km stretch.

**b. Questionable Award of Contracts**

The RDA awarded contracts for Lot 1 and 2 to China Geo Engineering Corporation through single sourcing. However the award of the contract was questionable in that the evaluation committee carried out various evaluations of eligible bidders in which China Geo Engineering Corporation was not recommended as the best bidder.

**c. Failure to Pay Contractor on Time**

According to the contract, once a contractor’s claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

A scrutiny of IPCs revealed that the delay in settlement of IPCs ranged from 90 to 360 days; this delayed the physical progress on the works. As of August 2016, Lots 1 and 2 had registered some progress though the physical progress significantly lagged behind time as shown in the table below.

<b>Lot</b>	<b>Amount Certified K</b>	<b>Amount Paid K</b>	<b>Balance K</b>	<b>Physical Progress as of October 2016</b>	<b>Time Elapsed</b>
1	91,598,870	88,866,005	2,732,865	15.70%	58.30%
2	61,627,921	53,181,922	8,445,998	25.20%	83.30%
3	65,217,587			11.10%	58.30%

A review of the progress report for August 2016, revealed that very little progress was registered on Lot 3 and as of August 2016, the contractor had suspended all the major project activities due to financial constraints incurred as a result of non-payment of its pending IPCs by RDA.

## **NORTHERN PROVINCE**

### **62. Periodic Maintenance of 50 km of Agricultural Feeder Roads in Kaputa District.**

On 30<sup>th</sup> October 2015, RDA engaged A-Plus Management Services to undertake the periodic maintenance of approximately 50km of agricultural feeder roads in Kaputa District at a contract sum of K29,377,586 VAT inclusive with a completion period of six (6) months. The commencement date was 21<sup>st</sup> November 2015 and a completion date of 20<sup>th</sup> May 2016 which was extended to 20<sup>th</sup> November 2016.

As of December 2016, the contractor had been paid amounts totalling K1,328,672 leaving two unpaid IPCs in amounts totalling K4,348,780.

The RDA, Regional Manager for Northern Province supervised the works.

The scope of works included;

- i. Bush clearing, earthworks,
- ii. construction of road formation and sub-grade,
- iii. construction of road pavement layers with wearing course,
- iv. construction of concrete lined open drains, and
- v. construction of culverts with inlet and outlet structures.

The following were however observed:

#### **a. Poor Contract Administration**

The contract was signed on 30<sup>th</sup> October 2015. In accordance with the contract, site possession should have taken effect fourteen (14) days after signing the contract and the commencement order should have been issued 21 days after contract signing. However, contrary to GCC 1.1 and GCC 21.1, the commencement order was issued on 5<sup>th</sup> January 2016.

It was further observed that as a result of delays in commencement of works, Addendum No.1 was authorised by the Procurement Committee extending the completion date by six (6) months to 20<sup>th</sup> November 2016.

**b. Failure to Provide Documentation of the Statement of Financial Position**

The bidding document required the bidder to provide historical information on the financial position and financial performance which had been audited by a certified accountant. Contrary to the ZPPA Act section 50(3) 50 (3) which provides that no methodology or criteria, other than those stated in the solicitation document shall be taken into account and all criteria shall be applied equally to all bids, A-Plus Management Services failed to provide the financial statements for the financial year ended 31<sup>st</sup> December 2012. However, the Evaluation Committee considered this a minor deviation. In the absence of the financial information the financial strength of the bidder could therefore not be assessed.

**63. Upgrading of Approximately 61 km of the 201 km of the Mbala to Kasaba Bay Road including 36 km of the Access road to Chief Mpande in Northern Province - Irregular Procurement of Works**

On 11<sup>th</sup> July 2016, RDA engaged China Civil Engineering Construction Corporation (Z) Limited to upgrade approximately 61km of the 201km Mbala to Kasaba Bay Road including 36km of the access road to Chief Mpande's Palace in Northern Province at a contract sum of K798,514,087 VAT inclusive with a completion period of twenty four (24) months and a commencement date of 25<sup>th</sup> July 2016, which was fourteen (14) days after the signing of the contract.

The scope of works included among other things; clearing of bush and vegetation, construction of drainage structures, construction of detours, maintenance grading of existing roads, mass earthworks, construction of pavement layers, construction of a double seal surface dressing, road marking.

In selecting the contractor for the works, RDA opted to use limited bidding in order to cut down on the time needed to procure the works. In the process of selecting the contractor, RDA undertook negotiations with China Civil Engineering Construction Corporation which according to ZPPA was contrary to the provisions of Regulation 75 of the Public Procurement Regulations No. 63 of 2011 as negotiations were not provided for under this procurement method.

In this regard, the awarding of the works to China Civil Engineering Construction Corporation was irregular.

**64. Upgrading of Chiengi to Kaputa Road (U2) and Luchinda D77 with 10 Km Urban Roads – Late Engagement of the Supervising Consultant**

On 1<sup>st</sup> July 2014, RDA engaged China Henan International Cooperation Group Co. Ltd and Copperfields Mining Services Ltd for the upgrading of Chiengi to Kaputa -78.1Km road (U2) and Luchinda 27.6Km D77 with 10 Km urban roads in Kaputa in Luapula Province at a contract sum of K500,040,614 VAT inclusive with a completion period of thirty (30) months.

As of December 2016, the contractor had been paid amounts totalling K15, 000,000 leaving an outstanding balance of K41, 494,269 in un paid IPCs.

Although the works commenced on 17<sup>th</sup> August 2015, as December 2016, the consultant had not been engaged.

**65. Upgrading to Bituminous Standard of the 151 km of the Kasama to Mporokoso Road, 10 km of the Mporokoso to Kawambwa and 10 km of the Mporokoso to Kaputa Road**

On 2<sup>nd</sup> September 2011, the RDA engaged Sable Transport Limited to upgrade to bituminous standard 151 km of the Kasama to Mporokoso, 10 km of the Mporokoso to Kawambwa and 10 km of the Mporokoso to Kaputa roads. The commencement date was 2<sup>nd</sup> September 2011 with a duration of thirty six (36) months at a contract sum of K421,706,455. As of August 2015, the contract sum had been revised upwards to K622,081,116. The completion date was also extended to 2<sup>nd</sup> March 2017.

As at 31<sup>st</sup> December 2016, RDA had paid the contractor a total of K215,974,090 leaving an outstanding balance of K2,650,633 for IPC number thirty-four (34).

The RDA also signed a consultancy contract with Rankin Engineering Consultants for a contract sum of K15,892,742 on 6<sup>th</sup> January 2012 which was revised to K34,142,252. The consultant's scope of works included designing of the road and supervision of the road works.

As of December 2016, the consultant had been paid a total of K18,004,732.

The scope of works included construction of earthworks, pavement layers, drainage works and surfacing of the carriageway.



The following were observed:

**a. Increase in the Cost of Contract**

The cost of the works contract increased by K200,374,661 from the original contract sum of K421,706,455 to K622,081,116 representing an increase of 32.2 percent through variation orders Nos. 1 to 4.

Consequently, the consultant's supervision contract sum was revised upwards from the original contract sum of K15,892,742 to K34,142,252 through variation orders Nos. 1 and 2. In this regard, the total cost of the project increased by K218,624,170.

**b. Interest Payment Claims by Consultant**

According to the contract, once a consultant/contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

On 1<sup>st</sup> September 2016, the consultant terminated the contract due to failure by RDA to settle claims on time contrary to the terms of the contract. As of December 2016, the consultant was owed amounts totalling K7,304,590 in respect of fourteen (14) unpaid fee notes and had since claimed interest of K48,859 on delayed payment of fee notes.

**c. Failure to Provide Key Personnel on Site**

Clause 9 of the General Conditions of Contract required the contractor to employ the key personnel named in the schedule of key personnel, as referred to in the contract, to carry out the functions stated in the schedule.

Contrary to contract requirements, the contractor did not have a Contract Manager on site since 20<sup>th</sup> September 2015. It was further observed that other key personnel such as Materials Engineer and Laboratory Technician were also not on site, thus compromising the quality of work.

A physical verification of key personnel conducted in September 2016 revealed that the Contracts Manager was still not on site.

**d. Failure to Renew Insurance Policies**

The contract completion date had been extended by eighteen (18) months from 14<sup>th</sup> September 2014 to 2<sup>nd</sup> March 2016 and then another extension of twelve (12) months was approved to 2<sup>nd</sup> March 2017.

It was however observed that contrary to the contract which required the contractor to renew the contractor's all risk policy and insurance against personal injury of employees, both policies which expired on 18<sup>th</sup> June 2016 had not been renewed as of September 2016.

**e. Physical Inspection**

The Physical inspections conducted on the road revealed the following:

**i. Visual Inspection and 3m Straight Edge**

The road was visibly poorly constructed at Km 82+000 RHS showing a depression of 20 mm over a stretch of 400 m and at km 90+125 showing a depression of 30 mm. These were above the requirement of maximum of 10 mm under clause 4212 construction tolerances and finishing requirements in SATCC specification.



*Surface Irregularities observed using a 3 m straight edge*

**ii. Stabilised Base Coring**

- At Km 93+000 LHS, three (3) cores crumbled. See picture below.



*Crumbled Core*

- At Km 54+050 LHS, the trial pit showed an average thickness of 121 mm against the required 150 mm and tolerance thickness limit of 123 mm.
- At Km 15+000 LHS, the trial pit showed an average thickness of 115 mm against the required 150 mm and tolerance thickness limit of 123 mm.

**iii. Road Signs Retro Reflectivity**

At Km 6+000, a sign with a white background showing curve ahead had retroreflection of 33.5 at an observation angle of  $0.2^{\circ}$  contrary to the required minimum of 50.

**66. Periodic Maintenance of 86 km from Chambeshi Bridge to Kasama Lot 2 Including 10 km of Urban Roads in Kasama Town**

On 10<sup>th</sup> March 2014, RDA engaged CADG Zambia Limited to undertake periodic maintenance of 86 km of M001 road from Chambeshi Bridge to Kasama in Northern Province Lot 2 at a contract sum of K155,887,138 VAT inclusive with a completion period of twelve (12) months. Contractual works commenced on 24<sup>th</sup> March 2014 and the completion date was 23<sup>rd</sup> March 2015.

On 23<sup>rd</sup> July 2015, the contract with CADG Zambia Limited was terminated due to breach of clause 59.2 of GCC and the contractor had been paid K2,259,817.

The scope of work included:

- Clearing of bush and vegetation,
- Construction of selected road layers,
- Pothole patching and shoulder widening,
- Drainage works,
- New double seal surfacing, and
- Ancillary works.

The following were observed:

**a. Failure to Pay Advance Payment on Time.**

Contrary to the contract which required that the employer makes advance payments to the contractor upon provision by the contractor of an unconditional bank guarantee /insurance bond, the RDA failed to pay the contractor the advance payment of K15,588,713 despite the contractor submitting the bank guarantee. As of June 2015, the advance payment had not been paid and the contractor had not fully mobilised.

**b. Failure to Pay Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within eighty four (84) days.

A review of progress reports revealed that RDA owed the contractor amounts totalling K12,281,616 in respect of unpaid IPCs which had been outstanding for fifteen (15) months.

As a result of the failure to pay IPCs, the following were observed:

- A physical inspection conducted in April 2015 revealed that the contractor had demobilised
- The contract was terminated on 29<sup>th</sup> July 2015 as the contractor stated that the RDA had breached clauses 59.2 (d) and 60.2 under the GCC of the contract document which required that certified claims are paid within 84 days from the date of making the claim.

- The contractor made claims in amounts totalling K20,886,568 citing interest on outstanding advance payment, loss on the depreciation of the Kwacha, loss of earnings compensation and fixed obligations.

**c. Failure to Engage Consultant**

Despite the works having commenced on 24<sup>th</sup> March 2014, as of July 2015, the consultant had not been engaged and consequently the following were observed:

- A review of minutes of the progress meeting dated 28<sup>th</sup> May 2014 revealed that there were no detailed plans, surveys and identification of roads to be worked on in respect of the additional 10 km of urban roads in Kasama town. Further, a review of a memorandum dated 12<sup>th</sup> June 2015 from the acting Director Maintenance to the Chief Executive Officer revealed that there was no meaningful progress after awarding of the contract due to non-availability of designs and drawings for the contractor to use.
- No subcontractors were engaged due to failure to engage a consultant to do the designs.

**d. Questionable Procurement Method on Works Contract**

On 1<sup>st</sup> September 2015, RDA single sourced the services of China Geo Engineering to execute the works at a contract sum of K528,803,094 with a contract duration of eighteen (18) months.

Although the Zambia Public Procurement Authority (ZPPA) granted RDA authority to direct bid China Geo Engineering Corporation for this, the authority granted was irregular in that the circumstances did not meet the criteria stated in Clause 32(2) as there was no evidence of an emergency and China Geo was not the only provider of the works.

## **LUAPULA PROVINCE**

### **67. Upgrading of the Samfya to Kasaba Bay Via Lubwe Road**

On 9<sup>th</sup> April 2014, RDA engaged BSBK Limited for the upgrading of 113 km of Samfya to Kasaba Bay via Lubwe (D096) Road in Luapula Province at a contract sum of K439,062,227 VAT inclusive with a completion period of thirty (30) months.

As of December 2016, the contractor had been paid amounts totalling K67,290,662.

The following were observed:

#### **a. Failure to Pay the Contractor on Time**

As of December 2016, the RDA owed the contractor amounts totalling K19,572,380 in respect of five (5) unpaid IPCs.

#### **b. Late Recruitment of the Supervising Consultant**

Although the contract was signed on 9<sup>th</sup> April 2014 and the contractor took possession of the site on 14<sup>th</sup> November 2014, the RDA had not engaged a consultant to supervise the works as of June 2015, fourteen (14) months after signing the contract. As of December 2016, the consultancy contract was not made available for verification.

#### **c. Physical Inspection**

It was observed that the contractor suspended works as shown in the pictures and tables below.

- i. The contractor has completed diversion for 40km.
- ii. Some embankment work at Km 32 has been completed.
- iii. Roadbed preparation at Km 32 to Km 38 has been completed.
- iv. Works came to a stop in June 2015 and the contractor's equipment was parked on site. See pictures on the next page.



*Idle equipment as a result of work stoppage*

**68. Upgrading to Bituminous Standard of 70 km of the Pedicle Road (Mokambo to Chembe)**

In the report of the Auditor General for the period October 2009 to December 2011 on the RDA, mention was made of the termination of the works contract with Fratelli Locci on 18<sup>th</sup> September 2012.

On 29<sup>th</sup> October 2012, the RDA signed a new contract with Copperfield Mining Services Limited for the continuation of the works at a contract sum of K278,824,387 VAT inclusive with a completion period of twenty four (24) months. The commencement date was 12<sup>th</sup> November 2012 ending 11<sup>th</sup> November 2014. The completion date was revised to 31<sup>st</sup> October 2016.

As of December 2016, the contractor had been paid amounts totalling K136,720,784 leaving an outstanding certified balance in respect of two (2) unpaid IPCs amounting to K14,517,687.

The RDA also had a standing consultancy contract with Rankin at a contract sum of K9,959,073. The contract sum increased by K3,687,922 from K5,543,635 due to an extension of consultancy services alongside the works contract.

As of December 2016, the consultant had been paid amounts totalling K4,502,937.

The scope of works included construction of a bridge at Lubambe and installation of various associated drainage structures.

The following were observed:

**a. Single Sourcing (Direct Bidding) of Contractor**

Section 32(2) of the Public Procurement Act states that a procuring entity may use direct bidding where—

- i. The goods, works or non-consulting service are only available from a single source and no reasonable alternative or substitute exists,
- ii. Due to an emergency, there is urgent need for the goods, works or services making it impractical to use other methods of procurement because of the time involved in using those methods,
- iii. Additional goods, works or services must be procured from the same source because of the need for compatibility, standardization or continuity,
- iv. An existing contract could be extended for additional goods, works or services for a similar nature and no advantage could be obtained by further competition, or
- v. The estimated value of the goods, works or services does not exceed the prescribed threshold.

Contrary to this provision, RDA single sourced Copperfield Mining Services Limited.

In response management stated that RDA management recommended the direct bidding of Copperfield Mining Services Limited to ZPPA in line with Section 32 subsection 2 (c) of the Public Procurement Act No. 12 of 2008 which states that “Direct bidding may be used where additional goods, works or services must be procured from the same source because of the need for compatibility, standardization or continuity.”

However, the section quoted by management referred to a contractor who had been subjected to a competitive bidding process of which Copperfield Mining Services was not subjected to.



**b. Termination of Consultancy Contract**

On 21<sup>st</sup> January 2015, due to funding constraints, RDA suspended all permanent works on the carriageway and the bridge which delayed the completion of the project. On 30<sup>th</sup> November 2015, Rankin terminated the consultancy contract with RDA due to non-payment of fee notes totalling K4,935,638. As of September 2016, RDA had employed independent consultants whose contracts were not availed for audit.

**c. Delayed Completion of Road Works**

The initial completion date for the upgrading to bituminous standard of the 70 km road works was twenty four (24) months to 11<sup>th</sup> November 2014. It was however observed that the contract completion date was extended by one (1) year to 31<sup>st</sup> October 2015 and then to 31<sup>st</sup> October 2016. As at 31<sup>st</sup> August 2016, overall physical works progress stood at 71.5 percent. The contractor had only managed to complete 45.9 km of Asphalt concrete level in three (3) years.

It was further observed during the inspection conducted in September 2016 that the bridge had not been completed as shown in the picture below.



*Bridge still under construction*

Although in response management stated that the project had been facing a lot of challenges especially that it is in a foreign country, some of the major challenges were;

- i. Border formality delays (Entry and Exit delays of construction vehicles due to border formalities).

- ii. Material availability - Road construction material was being hauled from the Zambian side as material sourcing and availability from within Congo was a challenge.
- iii. Working hours restrictions. The contractor was unable to accelerate on his own due to these restrictions including moving of materials across the border.

However, the works program took into account the issues raised above.

**d. Change of Key Personnel without RDA Approval**

A verification of key personnel on site in April 2015 revealed that the contractor had changed key personnel without seeking approval from RDA. In addition, two (2) of the key personnel had not been replaced. See table below.

<b>Position</b>	<b>Year of Resignation</b>	<b>Status</b>
Site Engineer/Agent	2013	Replaced
Materials Engineer	2014	Not Replaced
Surveyor	2013	Replaced
Concrete Foreman	2012	Not Replaced
Earthworks Foreman	2014	Replaced
Steel fixing Foreman	2014	Replaced
Laboratory Supervisor	2013	Replaced

**e. Failure to Maintain Temporary Traffic Road Signs for Accommodation of Traffic**

A physical inspection of the road revealed that there were no road signs from Km 0+000 to Km33+000. This was despite the contractor having been paid amounts totalling K1,265,000 towards the procurement and installation of temporary traffic road signs.

**f. Increase in Consultancy Contract Sum Due to Extension of Time**

It was observed that due to the extension of time for the completion of the construction of the 70 km from 11<sup>th</sup> November 2014 to 31<sup>st</sup> October 2015, the consultant’s contract sum increased by 44 percent from K5,543,635 to K9,959,073. As of September 2016, the consultant was not on site due to failure by the RDA to settle the consultant’s fee notes and RDA had since employed independent consultants.

**g. Physical Inspection**

During a trial pit test to assess the crushed stone base, it was observed that only one base thickness measurement met the 150 mm. All other measurements did not meet the 150 mm thickness or 123 mm minimum thickness as per SATCC clauses 3405 and 7205 as shown below:

- At Km 5+000 LHS, the average base thickness measured was 92 mm,
- At Km 10+000 RHS, the average base thickness measured was 105 mm,
- At Km 15+000 LHS, the average base thickness measured was 150 mm,
- At Km 20+000 RHS, the average base thickness measured was 123 m,
- At Km 25+000 LHS, the average base thickness measured was 100 mm, and
- At Km 30+000 RHS, the average base thickness measured was 108 mm.

**69. Rehabilitation and Upgrading of the Kawambwa Mushota Luwingu Road and the Chisembe-Chibote Chief Chama road in Luapula Province**

On 20<sup>th</sup> February 2013, RDA engaged Unik Construction Engineering Zambia Limited to rehabilitate and upgrade the Kawambwa Mushota Luwingu Road and the Chisembe-Chibote Chief Chama road in Luapula Province to bituminous standards at a contract sum of K258,773,699 with a completion period of twenty four (24) months. The contract was revised to K385,583,452 after approval of variation order No. 2 amounting to K126,809,753 with a revised completion date of April 2016.

Section I of the completed section of the road covering 158 km was handed over to the client in December 2015.

The scope of works included excavation, grading and other earth works, and Road paving and surface sealing, reinforced Concrete drainage works and signage.

On 28<sup>th</sup> June 2013, RDA engaged BCHOD Consulting Engineers to provide supervisory services for the Kawambwa - Mushota Road at a contract sum of K7,302,332. The consultant took possession and full control of the works on 9<sup>th</sup> August 2013.

However, the following were observed:

**a. Late Engagement of the Supervising Consultant**

Although works commenced on 28<sup>th</sup> June 2013, the consultant was only engaged on 9<sup>th</sup> August 2013.

**b. Failure to Pay the Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

As at 31<sup>st</sup> December 2016, K289,239,444 had been certified, the contractor had been paid amounts totalling K155,168,032 leaving an outstanding balance of K50,218,372 in respect of four (4) IPCs.

Further, the consultant was paid K2,603,982 out of certified works of K3,519,191 leaving a balance of K915,209 which had been outstanding since May 2015.

**c. Lack of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, which required that the drawings be availed at the commencement of the project, the final design was only approved on 21<sup>st</sup> April 2015, over one (1) year after commencement of the project.

**d. Lack of Capacity – Local Contractors**

The specific condition of contract, sub-clause 1.1.2.8 of Part A- Contract Data in the contract document states: "Subcontractor's participation is Mandatory: 20% of the contract price shall be reserved for and carried out by Zambian Citizen-owned Construction Companies duly registered with NCC in category R from grade 3,4 and /or 5.

The Road Development Agency nominated six (6) subcontractors to take up 20 percent worth of works on Kawambwa - Mushota road. However, a review of

correspondence from the main contractor to RDA revealed that four out of the six subcontractors had no capacity to carry out works on the contract. See table below.

Subcontractor	Contract Date	Scope of Works	Start Date	Remarks
Mazcon Civils Ltd	3/7/2013	Construction of Culverts and line drains	Aug-13	Nil
Investments Ltd	17/10/2013	Grading 20 km of gravel road	Apr-13	One bull dozer and one grader on site
Pine Roads and General Contractors Ltd	17/07/2013	Mass earth works and pavement layers	-	Not yet commenced as at September 2014.
Komunga Ltd	19/07/2013	Hauling gravel from borrow pit	-	Not yet commenced as at September 2014.
Luja Enterprise	11/5/2013	Culverts and line drains	-	Not yet commenced as at September 2014.
A&C Castle Construction Ltd	20/09/2013	Gravel haulage	Oct-13	Has only one truck on site

As can be seen from the table above, three (3) out of six (6) contractors failed to commence works for more than six (6) months after signing the contract. Two (2) of the contractors who commenced works on time had inadequate equipment.

In this regard, the main contractor was requesting for a one (1) year extension of time in order to attend to the shoddy works done by the subcontractors among other reasons.

**e. Delayed Decision on Variation Order**

According to clause 26.2, the project manager shall decide whether and by how much to extend the intended completion date within twenty one (21) days of the contractor asking the project manager for a decision upon the effect of a compensation event or variation and submitting full supporting documentation.

On 23<sup>rd</sup> December 2013, Unik Engineering Construction (Z) Ltd submitted a variation order to RDA for inclusion of omitted works in the design in order to complete the proposed road. This followed a design review by the engineer which revealed shortfalls of some quantities of various BOQ items. The variation order also required an extension of eight (8) calendar months bringing the revised completion date to 23<sup>rd</sup> September 2015. The variation order had an additional cost of K115,398,842.

However, despite the contractor submitting a variation order on 23<sup>rd</sup> December 2013, as at 21<sup>st</sup> April 2015, four (4) months after the submission, the RDA had not approved the request contrary to the clause.

At the time of inspection the contractor had suspended works due to exhaustion of BOQ items and non-approval of variation order No.1 among other reasons.

**70. Design and Construction/Upgrading of Mansa - Luwingu (M3) Road (175 km) in the Luapula and Northern Provinces and 30 km of Township Roads in Mansa and Luwingu**

On 27<sup>th</sup> December 2012, RDA engaged China Henan International Corporation Group Company Limited to design and construct/upgrade 175 km of the M3 road from Mansa to Luwingu to bituminous standard; upgrading of 10 km of township roads with double seal surface dressing in Mansa and Luwingu and 20 km of pothole patching and double seal surface dressing in Mansa Town Roads with a completion period of forty (40) months at a contract sum of US\$206,962,966.38 which was revised to US\$310,795,882.71.

The scope of the work included detailed engineering design in the first four (4) months and construction of 175 km road complete to bituminous standard during the last thirty six (36) months of the contract.

As of June 2015, a total of US\$123,967,877.66 had been certified out of which only US\$103,825,030 had been paid and the overall physical progress was at 56%. However the following were observed:

**a. Unjustified Procurement Method – Single Sourcing (Direct Bidding)**

According to the Public Procurement Act No. 12 of 2008, Section 32, Sub Section 2 (i) – (v), direct bidding is only used in special cases, such as:

- Goods, works or services are only available from a single source and no reasonable alternative or substitute exists;
- Due to an emergency, there is need for works or services making it impractical to use other methods of procurement;
- Additional goods, works or services must be procured from the same source because of the need for compatibility, standardization or continuity;
- Where an existing contract could be extended for additional goods, works or services of a similar nature and no advantage could be obtained from further competition; and

- Where an estimated value of the goods, works and services does not exceed the threshold prescribed in the Public Procurement Regulations.

According to the tender evaluation report on Tender No. ZPPA/CE/014/12 dated 30<sup>th</sup> October 2012, the RDA single sourced the contractor despite not meeting the basic criteria for single sourcing as outlined in the Act.

**b. Failure to Subject Sub-contractor to Competitive Bidding**

General Conditions of Contract Section 7.1 says that the Contractor may subcontract with the approval of the Project Manager, but may not assign the contract without the approval of the employer in writing. Sub-contracting shall not alter the obligations of the Contractor.

Contrary to this provision, it was observed that RDA nominated sub – contractors without involving the main contractor in the selection process.

In this regard, the sub-contractors were not subjected to competitive bidding as no tender evaluation reports for the selection of sub-contractors was availed for audit.

**c. Consultancy Awarded to a Non Responsive Bidder**

According to Public Procurement Regulation of 2011, No. 10 (3), an approvals authority shall make its decision regarding a procurement requirement submitted to it, in writing, stating the following:

- i. Whether the submission is approved or rejected;
- ii. The reasons for the rejection, if that is the case; and
- iii. The conditions applicable to the approved submission.

It was reported in the Committee Paper No. 4 that the initial technical proposals evaluation was rejected by the Procurement Committee because of several inconsistencies in the evaluation process. However, contrary to the regulation, the inconsistencies were not documented in the Committee Paper. In this regard, it was not clear how Bari Zambia Limited who was not responsive at the preliminary stage of the tender evaluation were preferred over BCHOD who was the only responsive bidder.

**d. Physical Inspections - Road Signs Retro Reflectivity**

At Km 6+600 and 0+100, signs with a white background showing curve ahead had retroreflection of 18.4 and 20.4 respectively at an observation angle of 0.2° contrary to the required minimum of 50.

**71. Periodic Maintenance of 245 km of the Road Section from Mansa to Nchelenge**

On the 30<sup>th</sup> July 2012, RDA engaged China Geo Engineering Corporation to undertake the periodic maintenance of 245 km of road section from Mansa to Nchelenge. The project was financed by DANIDA and the scope of works included reinstating shoulders, patching and repairing edges, reconstructing seriously damaged sections and applying a 13.2 mm single seal on the carriageway at an initial contract sum of K66,085,322 which was revised to K89,595,707.

As of December 2016, the contractor had been paid amounts totalling K90,085,074.

Further, the RDA engaged H.P. Gauff Ingenieure as a consultant at a contract sum of K3,370,960 with a contract duration of nineteen (19) months commencing on 1<sup>st</sup> August 2012.

The construction works started on 15<sup>th</sup> August 2012 with a completion date of 18<sup>th</sup> September 2013 which was revised to 1<sup>st</sup> October 2013. As of June 2015, at the time of the audit, the project had been completed and the final completion certificate was issued on 15<sup>th</sup> October 2014.

The following were observed:

**a. Questionable Selection of Bidder**

On 15<sup>th</sup> August 2011, the RDA evaluation Committee recommended that the contract be awarded to Messrs. China Jiangxi Corporation for International Economic and Technical Cooperation at a tender sum of K80,565,369 VAT inclusive with a twelve (12) months completion period.

However, China Geo Engineering Corporation was awarded the contract despite the fact that the bidder was eliminated during the preliminary evaluation on the grounds that the bidder attached a form of bid (Contractor's Bid) for a different project. This is contrary to Clause 4.3(a) of the Instruction to Bidders (ITB).



The Evaluation Committee considered this to be a major deviation and found China Geo Engineering Corporation to be non-responsive. However, the re-evaluation report and the grounds for the re-evaluation to justify the award of the contract to China Geo Engineering Corporation were not made available for audit.

**b. Poor Contract Management - Delay in Approving Variation of Works**

A review of the Final Completion Report dated November 2014 and a signed addenda revealed that there were delays in approving variation orders (VO) and signing of addenda and as a result, works were delayed as the contractor did not know whether to execute identified works included in the VO or leave them as the VO could either be accepted or rejected by the client. Three (3) VOs were introduced on the project and are as summarized below.

<b>VO No.</b>	<b>Scope</b>	<b>Date Requested</b>	<b>Date Approved</b>	<b>Addendum Signed on</b>	<b>Variation Amount K</b>
1	Design review	15.11.12	14.12.12	Addendum not Provided	19,640,627
2	Grass cutting along road (Contingency)	29.04.13	01.10.13	Addendum not Provided	167,300
3	Drainage in built up areas	03.05.13	01.10.13	21.02.14	4,669,758

The table on the previous page shows that addendum No. 3 for VO No. 3 was signed on 21<sup>st</sup> February 2014, which was five (5) months after the end of the contract period.

## **EASTERN PROVINCE**

### **72. Nacala Road Corridor Project (Phase II) - Wasteful Expenditure**

On 10<sup>th</sup> April 2013, RDA engaged Conduril – Engenharia S.A of Portugal for the rehabilitation of 114Km of the Great East Road between Nyimba and Sinda in the Eastern Province at a contract sum of K361,187,528 VAT exclusive with a completion period of twenty four (24) months. The contract start date was 7<sup>th</sup> June 2013 with a completion date was 7<sup>th</sup> June 2015.

According to the contract, the contractor was to be paid claims certified by the project manager within fifty six (56) days from the date of certification. Failure to settle the claims within the stipulated period would attract interest.

Despite the funds being available as this was funded by the Africa Development Bank (AfBD), RDA delayed in processing the contractor's claim resulting in the contractor claiming K826,573 as interest for the late payment of IPCs out of which K644,275 had been paid as of June 2015. The interest payment could have been avoided had the claim been processed on time. In this regard, the expenditure of K644,275 was wasteful.

### **73. Upgrading of Chipata – Vubwi – Chadiza Road: Contract No. ZPPA/CE/023/012: Lot 1**

On 19<sup>th</sup> April 2013, RDA engaged China Jiangxi Corporation for International Economic Cooperation to upgrade approximately 105 km of the Chipata – Vubwi – Chadiza roads, 5 km of Mpezeni Palace road, 2 km of Mwami Hospital road and 8 km of Vubwi township roads in Eastern Province to bituminous standard at a contract sum of K529,047,639 VAT inclusive which was revised to K605,873,677.

The contract commencement date was 2<sup>nd</sup> May 2013 with an initial completion date of 2<sup>nd</sup> May 2015. The completion date was later revised to 30<sup>th</sup> November 2016.

As of December 2016, the contractor had been paid amounts totalling K73,305,028.

On 29<sup>th</sup> November 2013, RDA engaged Ngáandu Consulting Limited to provide design review and construction supervision services for the upgrading of 277 km Chipata – Vubwi - Chadiza (Lot 1) and Chipata – Chadiza – Katete (Lot 2) in Eastern Province of Zambia at a contract sum of K22,617,197 which was revised to K42,311,536 through addendum Nos. 1 and 2.

As of December 2016, the consultant had been paid amounts totalling K20,467,244 leaving an outstanding balance totalling K3,670,543 in respect of six (6) fee notes.

The following were observed:

**a. Late Recruitment of the Supervising Consultant**

The supervising consultant was engaged on 29<sup>th</sup> November 2013 while the works commenced on 2<sup>nd</sup> May 2013 resulting in a delay of more than six (6) months.

**b. Lack of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor at the commencement of works.

As a result of not preparing the detailed engineering designs at the commencement of the project, RDA varied the contract by K76,826,038 with an extended completion date of 30<sup>th</sup> November 2016.

Further, due to the extension of time, the consultant's contract was revised upwards from K22,617,197 to K42,311,536.

**c. Failure to Pay Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days failure to which the contractor is entitled to charge interest on the outstanding claim.

A review of the Monthly Progress Report No.19 dated 29<sup>th</sup> August 2016 revealed that the RDA owed the contractor amounts totalling K24,732,560 in respect of seven (7) unsettled IPCs resulting in the contractor charging interest in amounts totalling K2,705,194. Further, the contractor suspended works on 2<sup>nd</sup> February 2015 and had not resumed work as of September 2016.



*Equipment parked due to work stoppage*

**d. Inadequate Material Testing Laboratory Equipment**

Clause B1400 of the contract – Housing, Offices and Laboratories for the Project Manager’s Site Personnel Subsection 1402 (c) – Laboratories, states that the contractor shall provide, erect and maintain for the duration of the contract, a main laboratory complying with details shown on the standard drawing, to the satisfaction of the Project Manager.

Subsection 1402 (c) xvi – Provision of Laboratory Equipment – further states, in part, that the laboratory equipment provided by the contractor shall be used for quality control by the Project Manager. Ownership of all laboratory equipment including documentation supplied shall revert to the Road Development Authority.

A review of the monthly Progress Report No. 13 issued by the supervising consultant and a physical inspection conducted in July 2015 revealed that some equipment had not yet been bought as indicated in the table on the next page.

	Quantity in BOQ	Quantity Acquired	Variance
<b>Maximum Dry Density / CBR Equipment</b>			
CBR Mould Bodies	44	15	29
<b>Field Density Equipment</b>			
DCP complete with extension to 2m	2	-	2
<b>Asphalt Testing</b>			
Flakiness Index Gauge	2	-	2

As of October 2016, the status had not changed.

**e. Physical Inspection**

A physical inspection of the road revealed the following:

- i. At Km 1+240 LHS, two (2) cores crumbled.
- ii. At Km 2+740 LHS, core retrieved. The average core thickness retrieved was 112 mm.
- iii. At Km4+240 RHS, core retrieved with thickness 85mm and the 2<sup>nd</sup> core drilled by the contractor was 70 mm thick.
- iv. At 6+540 LHS, 1<sup>st</sup> core crumbled thickness 0 and the 2<sup>nd</sup> core retrieved with average thickness of 60 mm.
- v. At 7+740 RHS, 1<sup>st</sup> core crumbled thickness 0 and the 2<sup>nd</sup> core retrieved with average thickness of 125 mm.
- vi. At Km1+800 LHS, no core retrieved. Core crumbled.
- vii. At Km 3+640 RHS, no core retrieved. Core crumbled.
- viii. At Km4+280 LHS, no core retrieved. Core crumbled.



#### **74. Chipata – Chadiza – Katete Road (Lot 2)**

On 21<sup>st</sup> March 2013, the RDA engaged China State Construction Engineering Corporation Limited to upgrade approximately 90 km of the Chipata – Chadiza – Katete (Chanida), 50 km of Katete – Chadiza roads and 10 km Chadiza township roads to bituminous standard in Eastern Province at a contract sum of K856,110,428 VAT inclusive with a completion period of twenty four (24) months ending 30<sup>th</sup> June 2017.

As of December 2016, the contractor had been paid amounts totalling K142,186,366

On 29<sup>th</sup> November 2013, the RDA engaged Ngáandu Consulting Limited to provide consultancy services at a contract sum of K22,617,197. The consultant's scope of works was design review and construction supervision of the project.

The following were observed:

##### **a. Lack of Detailed Engineering Drawings**

Contrary to Standard Engineering Practice, RDA had not provided detailed road engineering designs to the contractor as of August 2013, four (4) months after commencement of the works.

##### **b. Late Engagement of the Supervising Consultant**

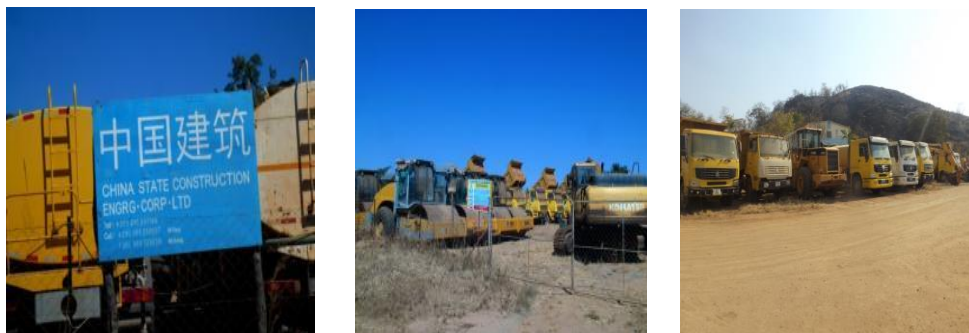
Although the works commenced on 4<sup>th</sup> April 2013, the supervising consultant was engaged on 29<sup>th</sup> November 2013 resulting in a delay of more than seven (7) months.

##### **c. Failure to Pay Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within fifty six (56) days failure to which the contractor is entitled to charge interest on the outstanding claim.

A review of the September Monthly Progress Report No.18 dated 1<sup>st</sup> September 2016 revealed that the RDA owed the contractor amounts totalling K158,724,768 in unsettled IPCs resulting in the contractor charging interest in amounts totalling

K50,426,659. Further, the contractor suspended works on 7<sup>th</sup> January 2015 and had not resumed work as of September 2016. See pictures below.



*Equipment Parked due to Work Stoppage*

**d. Irregular Variation of Scope of Works**

The RDA Procurement Committee at a meeting held on 19<sup>th</sup> August 2013 granted authority to vary the scope of works to include a 60km stretch omitted by the contractor in the original BOQ at an additional cost of K171,850,876 thus giving rise to a revised contract price of K713,114,097. This variation represented a 32% increase in the original contract price.

However, the variation was questionable as the contractor knew the length involved as was evidenced from the following documents reviewed namely; Minutes of the Pre-bid Meeting of 9<sup>th</sup> November 2012; Certificate of Bidder's Site Visit of 10<sup>th</sup> November 2012; ZPPA Addendum No. 1 of 15<sup>th</sup> November 2012; Letter of Contract Award dated 1<sup>st</sup> March 2013; and the contract signed between the Road Development Agency and the contractor.

In addition, the eventual variation to include the 60 km purportedly left out by the bidder meant that the bidder put themselves at an advantage compared to other bidders. It was questionable as to how the evaluation committee overlooked this issue and why the contract was not annulled and why the RDA allowed this variation considering the fact the contractor attended the pre-bid meeting and site visit.

**75. Upgrading of Approximately 104 km of D104/D791 Chipata to Mfuwe**

On 24<sup>th</sup> November 2009 the RDA awarded a contract to Sable Transport Limited for the upgrading of approximately 104 km of D104/D791 Chipata to Mfuwe in Eastern Province at a contract sum of K290,063,867 VAT inclusive with an initial completion period of

forty (40) months commencing on 14<sup>th</sup> December 2009 and was expected to be completed on 14<sup>th</sup> April 2013.

As of December 2016, amounts totaling K269,242,644 had been paid to the contractor.

The following were observed:

**a. Questionable Variation**

After the approval of variation orders for extension of time and the changes in the scope of works, the revised contract completion period was extended from 15<sup>th</sup> May 2015 to 17<sup>th</sup> May 2016. This was as a result of the inclusion of the rehabilitation of 25 km road from Mfuwe International Airport to South Luangwa National Park gate at the cost of K132,182,087 and the additional works at a cost of K17,146,070 whose scope included:

- River training works on the Lutembwe River at Lutembwe River crossing at Mambwe Boma,
- To repair wash away sections along the Chipata Mfuwe road, and
- Application of fog spray.

The project completion date was later revised to October 2016 to enable the contractor complete Lupande Bridge on the Mfuwe Road.

It was observed that the contract duration increased by thirty five (35) months and increased the contract price by K149,328,156 to K439,392,023 representing an increment of 51.1 percent. The increase was questionable as these works could have been tendered separately as the additional 25 km was separate from the contract and also the scope of works was asphalt while the main contract was surface dressing. Therefore, this was single sourcing.

**b. Failure to Renew the Consultant's Contract**

Mention was made in Auditor General's report for the period October 2009 to 2011 that the consultant's contract had expired in August 2011. In a letter dated 14<sup>th</sup> June 2011, RDA instructed its Procurement Department to grant authority to incur an additional expenditure to meet time related costs covering sixteen (16) months on the Supervision Contract for upgrading the Chipata Mfuwe road in an amount of K3,239,832 over and above the contract sum of K5,201,180.



A review of procurement committee minutes dated 6<sup>th</sup> February 2015, revealed that authority to single source BCHOD was granted. However, RDA had not yet awarded the contract to BCHOD as of August 2015. In this regard, consultancy services rendered between December 2014 and August 2015 were irregular.

**c. Questionable Pricing of the 25 km Mfuwe International Airport to South Luangwa National Park Gate**

The RDA varied the contract for Chipata – Mfuwe Road to execute additional works to rehabilitate the road from Mfuwe International Airport to South Luangwa National Park gate (approximately 25 km) at a cost of K132,182,087 VAT inclusive and extension of time of eighteen (18) months.

However, the cost price of K132,182,086 for the 25 km distance was not competitive in that the rates used were not in the initial contract as the road design was different from the main contract.

**d. Failure to Pay Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

As of December 2016, the RDA owed the contractor amounts totalling K40,720,224 in respect of three (3) unpaid IPCs. As of the same date the consultant was owed K4,528,316 in respect of five (5) unpaid fee notes.

**e. Physical Inspection**

A physical inspection of the road revealed the following:

**i. Visual Inspection**

- A distance of 300 metres on the left hand drive from Mfuwe airport was not constructed. The Mfuwe car park and 550 metres had not been constructed. The Chipata side of the road was not completed.
- Lutembwe Bridge – There were no warning signs indicating the bridge is single lane plus reducing speed limit.

- At Km 13+000 RHS, cracking was observed at the super elevation. A core taken on the crack reviewed that the cracks propagated all the way to the base, therefore the section must be reconstructed from the base. See picture below.



*A core taken on the crack reviewed that the cracks propagated all the way to the base*

- At Km 94+000, the culvert structure had no headwalls. See picture below.



*Culvert without headwalls along the  
Chipata - Mfuwe Road*

## **ii. Stabilised Base Coring / Trial Pit**

Seven (7) out of the ten (10) cores crumbled as shown below.

- At Km 10+275 RHS, the core crumbled.
- At Km 92+875 LHS, the average core thickness retrieved was 98mm.
- At Km 79+950 LHS, the core crumbled.
- At Km 100+500 RHS, the core crumbled.
- At Km 94+000 LHS, the core crumbled.

- At Km 95+730 RHS, the core crumbled.
- At Km 86+400 LHS, the core crumbled.
- At Km 75+800 RHS, average base thickness from trial pit was 110 mm.
- At Km 67+350 RHS, the core crumbled.
- At Km 60+000 RHS, the average base thickness from trial pit was 125 mm.

**iii. Township Roads–Mambwe District**

- At Km 0+100, Jumbe Road, the average core thickness retrieved was 20 mm and this did not meet the 150 mm thickness or 123 mm minimum thickness as per SATCC clauses 3405 and 7205.
- At Km 0+300, Council Guest Road, the average core thickness retrieved was 0 mm. The base thickness was 60 mm from the trial pit.

**iv. Township Roads – Mfuwe District**

- At Km 16+600 RHS, the base thickness was 140mm from the trial pit.
- At Km 14+400 LHS, the base thickness was 160mm from the trial pit.
- At Km 12+500 RHS, the base thickness was 195mm from the trial pit.
- At Km 10+800 LHS, the base thickness was 190mm from the trial pit.

Two measurements from the trial pit did not meet the 200mm thickness or 173mm minimum thickness as per SATCC clauses 3405 and 7205. See picture on the next page.



*Trial Pit along the road from Mfuwe to the Gate to South*

*Luangwa National Park*

**v. Longitudinal Streaking and Surface Irregularity**

- At Km 92+875, the average cross section surface irregularity was 15mm.
- At Km 79+950, the average cross section surface irregularity was 29mm.

Contrary to the requirement of maximum of 10mm under clause 4212 construction tolerances and finish requirements in SATCC specification.

- At Km 75+400 to Km 94+600, the road had longitudinal streaking for approximately 17 km contrary to the requirement as stated below.

The road also had vertical and horizontal curves which followed the existing road without being realigned on the upgraded road.

**76. Upgrading of Mpika – Nabwalya – Mfuwe Road (Lot 2, approximately 117 km)**

On 20<sup>th</sup> June 2014, RDA engaged Raubex Construction Zambia Limited to upgrade 117 km (Lot 2) of Nabwalya – Mfuwe in Muchinga Province at a contract sum of K540,831,955 (VAT inclusive and 10 percent contingency) with a completion period of thirty (30) months. Works commenced on 4<sup>th</sup> July 2014 with the completion date of 3<sup>rd</sup> January 2017. As of December 2016, the contractor had been paid amounts totalling K11,872,566.

The consultancy services were provided by Messrs. BARI Zambia Limited in association with Beza Consulting Inc. As of December 2016, the consultant had been paid amounts totalling K8,164,615.

The scope of works included, among other things:

- clearing of bush and vegetation, construction of selected road embankment layer, gravelling of sub- base and cement stabilization of gravel base layers,
- construction of new double seal bituminous surfacing extending over the shoulders in the selected sections, road markings and traffic signs, and
- provisions of guard rails, ancillary works, installation of drainage structures and construction of two bridges.

The following were observed:

**a. Questionable Award of Road Contract**

A review of the Tender Evaluation report dated May 2013 revealed that Sino hydro (Z) Ltd who had been ranked the first bidder for Lot 2 had already been awarded a contract for Kitwe - Chingola Dual Carriageway and that it had also been recommended for the award of the tendered works for Mpika – Nabwalya - Mfuwe (Lot 1)”.

It was however observed that although Sino hydro was not awarded the contract on the basis that they already had been recommended for the award of contract for contractual works for Mpika – Nabwalya – Mfuwe lot 1, a scrutiny of records for this project revealed that the contract was instead awarded to China Henan International Cooperation Group Company Limited.

**b. Failure to Pay Advance Payment on Time**

Contrary to the contract which required that the employer makes advance payments to the contractor upon provision by the contractor of an unconditional bank guarantee /insurance bond, the RDA did not pay the advance payment amounting to K40,562,396 as of August 2016 despite the contractor having submitted the bank guarantee.

**c. Failure to Pay Contractor on Time**

According to the contract, once a contractor's claim for payment is certified by the supervising consultant, RDA is obliged to settle the claim within twenty eight (28) days.

As of December 2016, the RDA owed the contractor amounts totalling K60,530,386 in respect of fourteen (14) unpaid Interim Payment Certificates which had been outstanding since July 2015. As of the same date the consultant was owed amounts totalling K7,208,697 in respect of eleven (11) unpaid fee notes.

As a result, the following were observed:

- The project works were affected in that only cumulative physical progress of 9.06 percent had been achieved against the target of 76 percent,
- Interest claims in amounts totalling K5,721,445 had been made, and
- The contractor had demobilised equipment and staff from the site.

It was further observed that the consultant had not been paid the fee notes amounting to K4,911,027 which had been outstanding since August 2015.

**77. Quarry Mines and Crusher Plants – Senkombo Quarry Mine in Kazungula**

RDA has various quarry mines and crusher plants across the Country. These assets are hired out mainly to contractors who extract aggregates for use on the roads in places near the mines. The following were observed:

**i. Irregular Operations of the Mines**

In December 2013, the RDA allowed BUK Truck Limited to run Senkombo Quarry Mine without a signed contract for a period of ten (10) months with a monthly royalty fee charge of K105,000 payable to RDA.

However, the decision to allow BUK Truck Limited to run the quarry without a signed agreement between the two parties was irregular. As of October 2016, BUK Truck Limited owed the RDA amounts totalling K890,000.

**ii. Failure to Avail Authority to Dispose of the Crusher Plant**

On 8<sup>th</sup> June 2016, the Provincial Administration for Southern Province sold the crusher plant to an individual without authority from RDA. The crusher plant was one of the assets the Government handed over from the defunct Roads Department to RDA. During a physical inspection conducted at the Senkobo mine in July 2016, individuals were found stripping the crusher plant. However, there was no evidence that RDA were aware of these activities.

On 3<sup>rd</sup> August 2016, RDA wrote to the Provincial Administration to reverse the sale; however in a response dated 30<sup>th</sup> September 2016, the Provincial Administration maintained that the sale was legitimate.

In this regard, it was not clear what security measures RDA had put in place to secure plants on quarry mines.

**VARIOUS PROVINCES**

**78. Construction of Toll Plazas - Procurement of Consultancy Contract for Lot 2 and 3 (Except for Munyumbi)**

On 5<sup>th</sup> November 2015, the Road Development Agency (RDA) requested the consultant, Rankin Engineering Consultants to provide ‘time based’ consulting services for detailed engineering and supervision of seven (7) toll plaza infrastructure at Levy Mwanawasa Stadium, Sabina (Gernaton), Kafulafuta, ZNS Kabwe, Katuba, Shimabala and Choma Toll Plaza (hereinafter called the “services”) at a total contract sum of K12,544,356 VAT Inclusive and a completion period of sixteen (16) months. The project completion date was 4<sup>th</sup> August 2015.

As of December 2016, the consultant had been paid amounts totalling K8,951,172.

The scope of services were as detailed below:

- i. Traffic validation and recommending alternative toll site locations if the processed site was observed not to be suitable
- ii. Deriving/ confirming the number of toll lanes for a minimum design period of 10 years.
- iii. Investigating and testing of construction materials for the pavement layers and toll plaza structures for both suitability and quantity

- iv. Provision of adequate pavement structure and geometric design including adequate drainage structures and embankment design.
- v. Architectural design review of toll plaza canopy, booth and administrative building and structural designs thereof;
- vi. Review of mechanical and electrical engineering designs of toll plaza equipment
- vii. Review of design of advanced Toll Management system and recommending an appropriate Toll Collection System (TCS).
- viii. Provision of adequate , as well as improved safety features including improved road marking and traffic signs;
- ix. An environmental impact assessment to identify those characteristics likely to have a significant impact on the environment
- x. Topographic survey for each toll plaza
- xi. Preparation of working drawings to provide full construction details.

The following were observed:

**a. Questionable Procurement of Consultancy Services**

A scrutiny of a combined evaluation document for consultancy services revealed that the RDA Procurement Committee single sourced the procurement of consultancy services for the detailed engineering designs and construction supervision of toll Plaza infrastructure country wide. Management did not avail for audit, copies of the ‘no Objection’ granted by ZPPA to single source consultancy services.

As a result, it was not possible to determine whether the justification was in line with Clause 32 of the Public Procurement Act.

**b. Irregular Provision of Consultancy Services**

A review of the progress report No 8 revealed that the contract document for consultancy services for the seven (7) Toll Plazas (Levy Mwanawasa Stadium, Sabina (Gernaton), Kafulafuta, ZNS Kabwe, Katuba, Shimabala and Choma) was signed on 5<sup>th</sup> November 2015, twelve months (12) months after works at toll plazas had commenced on 14<sup>th</sup> November 2014. In this regard, the consultancy services



rendered by Rankin without a contract from 14<sup>th</sup> November 2014 to 5<sup>th</sup> November 2015 were irregular.

**79. Construction of Toll Plaza - Lot 2 (Kafulafuta, Manyumbi, Choma) – Delayed commencement of Contractual Works**

On 31<sup>st</sup> October 2014, the RDA engaged Messrs Nzovu Transport Enterprises Limited for the construction of Toll Plazas under Lot 2 at a contract sum of K83,899,359 VAT Inclusive with a completion period of twenty – five (25) months. Works commenced on 14<sup>th</sup> November 2014 was to be completed on 8<sup>th</sup> December 2016.

Toll Plaza for Lot 2 comprised of the following:

- i. Kafulafuta between Kapiri and Ndola T03 Road section (3X 3 lanes at points where the booth is constructed).
- ii. Munyumbi between Kabwe and Kapiri Mposhi (T02) Road (3 X 3 lanes at points where the booth is constructed).
- iii. Choma between Choma and Monze (T01) Road Section (3 X3 lanes at points where the booth is constructed).

It was observed that contractual works at Munyumbi and Kafulafuta Toll Plazas delayed in commencing in that despite the initial contract start date being 14<sup>th</sup> November 2014, the works only commenced on 30<sup>th</sup> January 2015 resulting in a delay of seventy eight (78) days.

As of September 2016, works at Choma Toll Plaza had not commenced.

**80. Construction of Toll Plaza - Lot 3 at Sabina /Garnaton, Kamfinsa Levy Mwanawasa Stadium**

On 31<sup>st</sup> October 2014, RDA engaged Shire Construction Company Limited to construct toll plazas under Lot 3 at a contract sum of K74,481,744 VAT Inclusive with a completion period of twenty five (25) months. Works commenced on 14<sup>th</sup> November 2014 with an expected completion date of 8<sup>th</sup> December 2016.

Toll Plaza for Lot 3 comprised of the following:

- i. Sabina /Garnaton between Kitwe and Chingola T03 Road section (3 X 3 lanes at points where the booth is constructed).

- ii. Kamfinsa between Ndola and Kitwe (T02) Road Section (2 X 2 lanes at points where the booth is constructed) in the Copperbelt Provinces.
- iii. Levy Mwanawasa stadium between Ndola and Kitwe (T03) Road Section (2 X2 lanes at points where the booth is constructed) in the Copperbelt Provinces.

As of August 2016, a total amount of K6,904,243 had been paid to the Contractor and the physical progress was 16.4 percent.

The following were observed:

**i. Questionable Method of Procurement**

According to Clause 29 (2) of the Public Procurement Act, limited bidding may be used where:

- i. The goods, works or services are only available from a limited number of suppliers; or
- ii. There is an urgent need for the consulting services and engaging in open bidding would therefore be impractical.

It was observed that the RDA invited proposals from shortlisted contractors. However, there was no documentary evidence to justify the use of limited bidding.

Further, because of the method of procurement used where a few contractors were shortlisted to submit proposals for contractual works, there were no bidders for Lot 1, only one (1) for Lot 2 and two (2) for Lot 3. In this regard, the works were subjected to few bidders and hence it was questionable whether the contractors were competitively selected.

**ii. Failure to Renew Contract Security Documents**

A scrutiny of progress report No. 8 issued in August 2016 revealed that the contractor's all risk policy, employees' liability, public liability and group personnel accident for Mwanawasa Stadium toll gate expired on 29<sup>th</sup> October 2015 and had not been renewed as of December 2016.

## **81. PAVE ZAMBIA 2000**

In 2013, the Government, launched a five (5) year project dubbed PAVE Zambia 2000 to pave approximately 2,000 km of urban roads in townships using paving blocks technology.

The project involved procurement of equipment, production of pavers and paving the selected roads. The following were observed:

### **i. Under-funding of Pave Zambia 2000 Projects**

A review of the estimates of revenue and expenditure for the period from 2013 to 2015 revealed that the total approved budget for the procurement and installation of equipment, production and laying of pavers was K163,000,000 out of which only K15,866,935 was funded resulting in an underfunding of K147,133,065.

### **ii. Procurement of Equipment (Lot 8) – Irregular Award of Contract to Shaftex Zambia Limited**

RDA engaged Shaftex Zambia Limited to supply fifteen (15) segmented paving equipment at a contract sum of K10,237,500. However, the award of the contract was irregular in that during the evaluation of the bids, the Evaluation Committee found all the bidders including Shaftex Zambia Limited to be non-responsive and recommended that the tender be re-advertised.

Contrary to ZPPA regulations, the Procurement Committee proceeded to award the contract to Shaftex Zambia Limited without reverting to the Evaluation Committee for re-evaluation of the bid.

### **iii. Failure to Utilise Equipment**

In 2013, RDA engaged Shaftex Zambia Limited to supply fifteen (15) segmented paving machines at a total cost of K10,237,500. The machines were delivered to the RDA regional offices for use in laying paving stones under the PAVE Zambia 2000 project.

A scrutiny of the bid documents for Lot 8 and tender evaluation report for the supply and delivery of PAVE Zambia 2000 equipment revealed that the specification for the segmented paving block machine only specified number of

machines, production of at least 300m<sup>2</sup> in an 8 hour shift and 6.1m wide paving machine. RDA failed to specify whether the machines should be electric or manually driven, as a result electric machines were delivered by Shaftex Zambia Limited.

However, a physical inspection of the equipment delivered to the ten (10) RDA Regional offices conducted in June 2016, revealed that the machines had never been used since they were delivered in 2013.

At the time of the physical inspection, it was observed that in regions where paving blocks have been laid, they were laid manually. See pictures below.



*Parked segmented paving block machines*

*RDA staff manually laying pavers at Mansa General Hospital*

#### **iv. Receiving of Equipment with “Wrong Specifications.”**

On 2<sup>nd</sup> November 2012, RDA engaged Shaftex Zambia Limited to supply and deliver fifteen (15) self-propelled vibrating rollers at a contract sum of K2,940,600 VAT inclusive with a delivery period of six to eight (6 - 8) weeks.

On 29<sup>th</sup> November 2012, the contractor was paid an advance payment of K294,060 being 10 percent of the contract sum.

On 14<sup>th</sup> March 2013, Shaftex Zambia Limited delivered equipment of a wrong specification to RDA Mumbwa Road Workshop. The equipment was rejected by RDA who demanded that the contractor removes the equipment from their premises.

A physical inspection of the equipment conducted on 8<sup>th</sup> July 2016 revealed that the rejected self-propelled vibrating rollers were still parked at RDA Mumbwa Road Workshop.

As of September 2016, the supplier had not supplied RDA with the correct equipment and the advance payment had not been recovered.

**v. Slow Progress of the Pave Zambia 2000 Project**

A review of the feasibility study report on PAVE Zambia 2000 revealed that theoretically, a kilometre of a 6.1 m wide road required a total of 274,500 pavers (*6.1m x 1,000m x 45 pavers/m<sup>2</sup>*). A review of plans, budgets and production sheets for activities under Pave Zambia 2000 project revealed the following:

**vi. Planned Paver Production by December 2015 vs Actual Production**

RDA planned to pave a total distance of 407 km; this meant that a total of 111,721,500 pavers should have been produced by the end of December 2015. However, 4,341,363 pavers had been produced as of October 2016 which were only enough to pave 16.1 km. A physical inspection of paver production facilities revealed that production had been halted in all the regions.

**vii. Distance (Km) Planned to be Paved by December 2015 Vs Actual Distance Paved**

Out of the 407 km that was planned to be paved, only 16.1 km (Lusaka - 11.6 km, Eastern - 1.06 km, Copperbelt - 0.2 km, North-Western - 2.64 km and Luapula - 0.6 km) had been paved as of October 2016.

**viii. Failure to Register Equipment - Grader**

A physical inspection of equipment carried out in June 2016 revealed that contrary to the Road Traffic Act, ten (10) graders at six (6) regional offices had not been registered.



*Part of the 15 self-propelled vibrating rollers at RDA Mumbwa Rd Yard*



*Unregistered Grader at Ndola RDA*

**82. Force Account Projects Carried Out in the Provinces During the Period from 1<sup>st</sup> January 2013 to 31<sup>st</sup> December 2015**

During the period from 1<sup>st</sup> January 2013 to 31<sup>st</sup> December 2015, the RDA received a total of K141,322,000 from the National Road Fund Agency for emergency/force account works such as pothole patching, bridge repairs and other emergency related works on various roads in the provinces. The following were observed, see next page.

**a. Lack of Segregation of Duties**

It was observed that there was no segregation of duties between the stores and finance functions in all the Regional Offices in that the accounting officers who were responsible for accounting functions which included dealing with payments for the procurement of stores items were also responsible for the receipting, issuing and general maintenance of stores items procured under force account.

**b. Non Maintenance of Stores Records**

Contrary Public Stores Regulation No.16 which states that “every stores officer or any other officer having in his charge any public stores or other articles of public property must keep and maintain records of the receipt and issue of such public stores”, it was observed that there was no stores register, bin cards or field records regarding the loose tools such as hoes, shovels, picks, arc saws, tents, rakes, deformed bars, angle bars, generators, slashers procured, used and returned after project usage for all the force account projects undertaken by Livingstone, Mongu, Kabwe, Ndola, Lusaka , Kasama and Solwezi regional offices.

**c. Failure to Undertake Inventory Count**

Contrary to Clause 37 of Stores Regulations which states that “All stocks of public stores shall be completely verified at least once in a year by a duly appointed stock verifier”, the Regional offices did not undertake year-end inventory counts for loose tools and other stores such as cement, Y-bars and deformed bars during the period under review.

**83. Overall Recommendations**

The overall recommendations are as follows:

- i. The consultants must be engaged and detailed engineering designs produced before tendering of works contract.
- ii. All contracts must be referred to the Board for approval before signing.
- iii. All contracts should be referred to NRFA for confirmation of availability of funds before award of contracts.
- iv. Variations of above 25 percent of the initial contract sum must be referred to the Board for approval.
- v. RDA to develop and implement a system of disqualifying underperforming consultants and contractors.
- vi. RDA to develop a mechanism to monitor the presence of consultants’ staff on site and on the use of project vehicles.
- vii. Consultants’ staff should not manage more than one project at any given time.

- viii. Funds must be recovered for works found to be below specifications and the certifying officers must face appropriate disciplinary action, including blacklisting.

#### **84. Conclusion**

This Report has highlighted various areas of weaknesses in the management of procurement and execution of road projects. It is important that these weaknesses are resolved in order that RDA can meet their objectives and efficiently and effectively deliver to the expectations of the Zambian citizens.

**AUDIT HOUSE**

**HAILE SALASSIE AVENUE**

**LUSAKA**

10<sup>th</sup> February 2017

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**ACTING AUDITOR GENERAL**

**REPUBLIC OF ZAMBIA**



## Glossary of Words

<b>AASHTO Density</b>	The Maximum Dry Density and Optimum Moisture Content in the soil which is determined after compaction of selected soils at different moisture contents.
<b>Advance payment</b>	Initial part payment of an agreed percentage made to the contractor for purposes of mobilization which is recovered by the employer/client in agreed instalments during contract execution.
<b>Guarantee/Bond</b>	Document used when the contract provides for <i>advance payment</i> to be made to the contractor, and it <i>guarantees</i> that the <i>advance payment</i> will be returned to the employer/client by the contractor if he fails to execute works.
<b>Aggregates</b>	Coarse particulate material which is used in road construction which includes sand, gravel, crushed stone, slag, recycled concrete used in the formation of road layers
<b>Amount Certified</b>	Amount officially attested or confirmed as being the genuine or true reflection of works done or meeting specified requirements or standards.
<b>Ancillary Road Works</b>	Work other than the main contractual works that the contractor undertakes.
<b>Approved Budget</b>	The expenditure authority derived from law, appropriation bill authorized by Parliament.
<b>Asphalt paving</b>	Surfacing roads, parking lots and airports using composite material which consists of mineral aggregate bound together with bitumen and cement, laid in layers and compacted.
<b>Base</b>	A layer of material in an asphalt roadway located directly under the surfaced layer, normally constructed directly above subbase layer.
<b>Bellmouth</b>	Bellmouth is the widening of the road at an intersections to create enough turning curvature for vehicles
<b>Bid Bond</b>	A debt secured by a bidder for a construction job or similar type.
<b>Bill of Quantities</b>	A document that provides project specific measured quantities of the items of work identified by drawings and specifications. It is used to prepare prices for carrying out works.
<b>Bitumen</b>	A black viscous mixture of hydrocarbons obtained naturally or as a residue from petroleum distillation. It is used for road surfacing and roofing. In road construction, it is used as the glue or binder mixed with aggregate particles to create Hot Asphalt Mix or other road seals

<b>Bituminous Layers</b>	A thin protective wearing surface that is applied to a pavement or base course, also known as a seal coat or chip seal.
<b>Bleeding</b>	Bleeding is a shiny black surface film of road surface on the road surface caused by upward movement of bitumen in the pavement surface. Common causes of bleeding are too much bitumen in road surface, hot weather, low space air void content and quality of road surface.
<b>Bollards</b>	According to <i>Trafficcalming.org</i> , bollards can be used, either to control traffic intake size by limiting movements, or to control traffic speed by narrowing the available space.
<b>Borrow Pits</b>	An excavated area where material has been dug for use as fill at another location.
<b>Certified IPC</b>	The value of the work completed in the construction project less any amounts already paid, less retention approved by RDA.
<b>Chainage</b>	The distance along a curved or straight survey line from a fixed commencing point as given by an odometer.
<b>Commencement Date</b>	Contracted date when contractor must begin work on a project.
<b>Completion Date</b>	The date of completion of the works as certified by the Project Manager.
<b>Construction Joints</b>	An expansion joint or movement joint is an assembly designed to safely absorb the heat-induced expansion and contraction of construction materials, to absorb vibration, to hold parts together, or to allow movement due to ground settlement or earth.
<b>Consultant</b>	A professional who provides expert advice in a particular field such as engineering, science or any of the many other specialized field.
<b>Consulting Engineer</b>	Qualified independent expertise in engineering, providing design review and supervision services to the contractor on behalf of the Client (RDA).
<b>Contract Amount</b>	Amount accepted in the letter of acceptance for the execution and completion of the works and the remedying of any defects.
<b>Contract award</b>	The method used during a procurement in order to evaluate the proposals (tender offers) taking part and award the relevant contract.

<b>Contract Price</b>	Accepted Contract amount stated in the letter of acceptance and thereafter as adjusted with the contract.
<b>Contract</b>	The Agreement between the Client (RDA) and the Contractor / firm engaged to execute, complete and maintain road works.
<b>Contractor</b>	The party whose Bid to carry out the work has been accepted by the Client (RDA).
<b>Core</b>	A cylindrical sample of earth, mineral, or rock extracted from the ground by <i>means</i> of a <i>corer</i> so that the road layers distribution can be measured.
<b>Coring</b>	A process of extracting a cylindrical sample of road layers using a Coring machine.
<b>Coring Machine</b>	Machine used to extract cores out of Asphalt and Concrete pavements.
<b>Client</b>	The party who employs the Contractor to carryout works.
<b>Crumbled Cored</b>	A core which have failed to be retrieved using the coring machine
<b>Crushed Stone</b>	A form of construction aggregate, typically produced by mining a suitable rock deposit and breaking the removed rock down to the desired size using crushers.
<b>Defect Liability Period</b>	A set period of time after a construction project has been completed during which a contractor has the right to return to the site to remedy defects. A typical defects liability period lasts for 12 months.
<b>Defects</b>	Any part of works not completed in accordance with specifications in the contract.
<b>Demobilization</b>	All activities and costs for transportation of personnel, equipment, and supplies not required or included in the contract from the site; removal and site cleanup, of offices, buildings and other facilities assembled on the site specifically for this contract.
<b>De – silting</b>	<i>Removal</i> of silt (fine grained clay/lake-bed soil) from drainage that can be done manually.
<b>Drawings</b>	The drawings of works, as included in the contract, and any additional and modified drawings issued by (or behalf of) the Employer in accordance with the Contract, include calculations and other information provided by the project Manager for the execution of the Contract

<b>Double Surface Dressing</b>	A layer of single size chippings; 6mm, 10mm or 14mm single size chipping is applied with the first spray application of bitumen emulsion to form the bottom layer
<b>Employer</b>	The party who employs the Contractor to carryout works.
<b>Engineers' Estimates</b>	A detailed cost estimate for a project, computed by estimating the cost of every activity in a work breakdown structure summing these estimates, and adding appropriate overheads.
<b>Equipment</b>	The Contractor's machinery and vehicles brought temporarily to the site to execute the works.
<b>Initial Contract Price</b>	The Contract Price listed in the Client's Letter of Acceptance.
<b>In situ</b>	A method of fabricating reinforced concrete where the concrete is poured into formwork right at the construction site.
<b>Liquidated Damages</b>	Damages whose amount the parties designate during the formation of a contract for the injured party to collect as compensation upon a specific breach (e.g., late performance).
<b>Materials</b>	All supplies, including consumables used by the contractor for incorporation in the works.
<b>Mobilization</b>	Activation of a contractor's physical and manpower resources for transfer to a <i>construction</i> site until the completion of the contract.
<b>Paved Shoulder</b>	Portion of the outer road surface primarily for accommodation of stopped vehicles for emergency use which is paved or stabilized to provide a better all-weather support than offered by the untreated subbase course.
<b>Performance Guarantee/Bond</b>	A surety bond issued by an insurance company or a bank to guarantee satisfactory completion of a project by a contractor.
<b>Plant</b>	Any integral part of works that shall have a mechanical, electrical, chemical, or biological function.
<b>Public Roads Acts</b>	The Act No. 12 under which the Roads department is governed.
<b>Reconstruction</b>	Replacement of the entire existing pavement structure by the placement of the equivalent or increased pavement structure.
<b>Remedial Works</b>	Works intended to correct something that is wrong or to improve badly constructed works.

<b>SATCC</b>	Acronym for Southern Africa Transport and Communications Commission which are standard specifications and design guides for Roads and Bridges.
<b>SATCC Clause</b>	A particular or separate article in the in the SATCC standard specifications and design guides for Roads and Bridges.
<b>Sink Hole</b>	A cavity in the ground, especially in a limestone formation, caused by water erosion and providing a route for surface water to disappear underground.
<b>Site</b>	The area where actual works are to be executed.
<b>Site handover</b>	The formal <i>handover</i> of the <i>site</i> to the client which takes place once the contract administrator has confirmed that the works defined in the contract have been constructed to the Client's satisfaction.
<b>Site Possession</b>	The formal handover meeting when the contractor is granted access to the site to execute works until completion.
<b>Snag List</b>	A fully comprehensive list of items that the contractor has not completed correctly and defective work to be repaired.
<b>Start Date</b>	The latest date when contractor shall commence execution of the works.
<b>Sub base</b>	The <i>layer</i> of aggregate material laid on the subgrade, on which the <i>base</i> course <i>layer</i> is located.
<b>Subcontractor</b>	A person or corporate body who has a Contract with Contractor to carry out a part of the work in the contract, which includes work on the Site.
<b>Stabilized base</b>	A base which is stabilized by adding water, lime, sodium chloride, fibers, and bitumen. Combination of soil-cement in the presence of water is considered as another material for pavement base or sub-base.
<b>Termination of Contract</b>	Refers to when the contract becomes void of legal binding due to either party to the contract failing to perform their obligation.
<b>Temporary Works</b>	Works designed, constructed, installed, and removed by the contractor that are needed for construction or installation of the works.
<b>Trial Pits</b>	An excavation of ground in order to study or sample the composition and structure of the subsurface, usually dug during a site investigation, a soil survey or a geological survey.

<b>Unconstrained</b>	A budget constraint represents all the combinations of goods and services
<b>Budget</b>	that a consumer may purchase given current prices within his or her given income.
<b>Under -Budgeting</b>	Expenditure involving less money than had been planned for.
<b>Variation</b>	An instruction given by the Project Manager which varies the works.
<b>Variation Order</b>	An alteration to the scope of works in a construction contract in the form of an addition, substitution or omission from the original scope of works.
<b>Vendor Rating System</b>	A system used by buying organizations or industry analysts to record, analyze, rank and report the performance of Vendors.
<b>Works</b>	What the Contract requires the Contractor to Construct, install and turn over to the Client.

## Appendix 1 - Description of the Processing of Interim Payment Certificates

Agency	Stage No.	Description
<b>RDA</b>	1	Certification by the Regional Engineer (RE)
	2	Postage by RE to RDA HQ
	3	Receipting of certificate by RDA HQ
	4	Verification by engineer
	5	Verification by Senior Manager Construction and Maintenance
	5	Processing by accounts
<b>NRFA</b>	6	Signing of covering letter by Director and submission to NRFA
	1	Receipting of Request for Payment and retrieval of contract files
	2	Verification by Monitoring and Evaluation
	3	Verification by Internal Audit
	4	Preparation of payment vouchers and writing of cheques and processing in Accounting System
	5	Approval by Director
	6	Issuing of cheques to RDA or bank transfer

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