



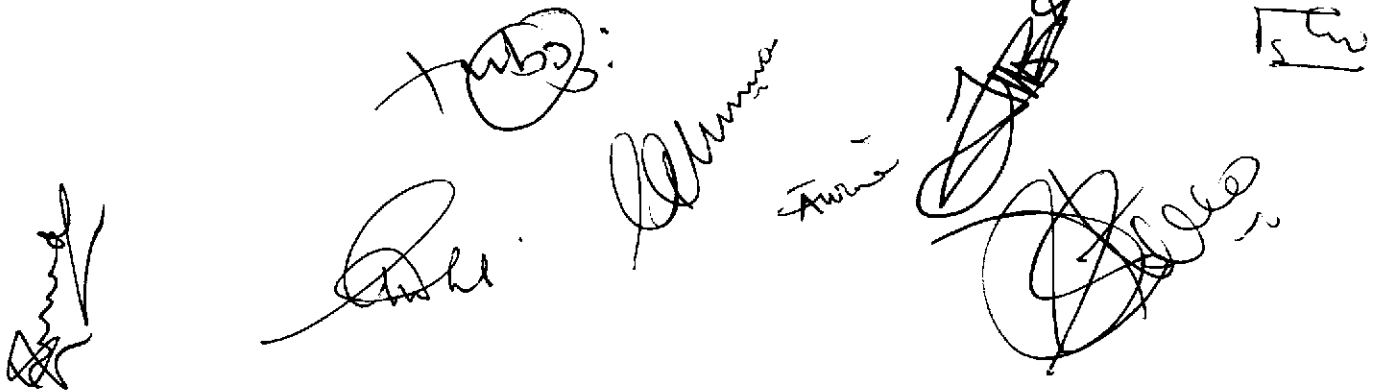
PARLIAMENT OF UGANDA

REPORT OF THE COMMITTEE ON PHYSICAL INFRASTRUCTURE ON THE  
DEVELOPMENT OF BUMPS ALONG THE NEW BRIDGE ON RIVER NILE, JINJA

OFFICE OF THE CLERK TO PARLIAMENT  
FEBRURAY 2019

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**List of Acronyms**

UNRA	Uganda National Roads Authority
NCR	Northern Corridor Route
JICA	Japan International Cooperation Agency
PAPs	Project Affected Persons
AC	Asphalt Concrete

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## 1 Introduction

Hon. Members,

At the 9th sitting of the 3<sup>rd</sup> Meeting of the 3<sup>rd</sup> Session of the 10<sup>th</sup> Parliament of Uganda, held on Tuesday 29<sup>th</sup> January 2019, Hon. Frederick Angura (MP Tororo Country South) raised concern on the development of defects along the new, Source of the Nile Bridge on River Nile at Jinja, particularly the road section to Kampala. The Speaker directed the Committee on Physical Infrastructure to investigate the matter and report back to Parliament.

This was a culmination of an attempt to explain the development of defects along the new Bridge in Jinja by the Minister of State for Works and Transport (works) Gen. Edward Katumba Wamala.

On the 29<sup>th</sup> day of January 2019, the Minister of state for works Hon. Gen Edward Katumba Wamala presented a statement in response to a matter raised by Hon. Fredrick Angura (MP Tororo County South) regarding the development of bumps along the new bridge.

Members of the House raised great concern in response to the Minister's statement expressing dissatisfaction over the Minister's explanation over the condition and physical state of the newly constructed Bridge. In response, the Minister of state for Works reiterated by informing the House that the damage was only on the surface of the Bridge and that the structure of the Bridge as a whole did not have any defects. He also invited Parliament to set up an independent team of members of parliament who may wish to conduct an investigation into the matter.

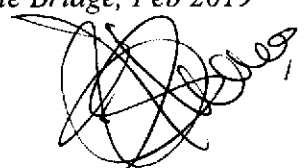
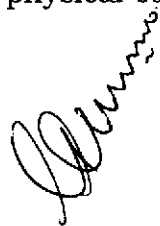
It is against this background that the Speaker directed the Committee on Physical infrastructure to investigate the development of defects along the new Bridge on River Nile and report back to Parliament.

The Committee in accordance to Rule 156 (c) and (e) undertook an on sight assessment of the new Nile Bridge and hereby reports.

## 2 Methodology

To accomplish the scope of the investigation, the Committee;

- a. Travelled to Jinja on Thursday 7<sup>th</sup> February 2019 and interface with;
  - i. Officials from the Uganda National Road's Authority
  - ii. Officials representing Joint Venture of Zenitaka Corporation and Hyundai Engineering and Construction Co. ltd (contractor)
  - iii. Officials representing Joint Venture of Oriental Consultants Co. Ltd, Eight - Japan Engineering Consultants Inc. and PyungHwa Engineering Consultants Ltd (Consultant firms)
- b. Accessed the Bridge to assess the physical condition and structural state of the Bridge.



### 3 Scope of the Investigation.

The Committee set out to ascertain;

- i. Whether indeed there were development of defects along the new Source of the Nile Bridge on River Nile, Jinja
- ii. The physical state of the Source of the Nile Bridge
- iii. The total cost incurred for repairs on the Bridge
- iv. Other matters incidental there to.

### 4 Project background

Government of Uganda in the Financial year 2010/2011 acquired a loan amounting to US Dollar 102 Million (about Ug shs. 232 Billion) to fund the construction of the Source of the Nile Bridge Project. Uganda National Road's Authority (UNRA) on behalf of Government of Uganda contracted Joint Venture of Zenitaka Corporation and Hyundai Engineering and Construction Co. Ltd, a Japanese company to undertake the construction of the Bridge. The Construction of the Bridge started on 14<sup>th</sup> April 2014 and by May 2018, the works on the main bridge structure were completed.

The Source of the Nile Bridge is located across the River Nile, between the Source of the Nile to the South and Nalubaale Power Station to the North approximately 500m south of the existing Kampala. Broadly, the structure consists of 525m long and 22.9m bridge deck designed with two-way paved to class 1B dual lane configuration, with two No. 69m high reinforced concrete, inverted - Y pylon towers founded on the pile foundations. A total of approximately 2km access has been constructed on both Jinja and Njeru side connecting the Bridge to the existing Jinja Kampala highway.

The objective of constructing the bridge was mainly to;

- i. contribute to the Country's economic growth by promoting economic development and integration of Uganda,
- ii. ensure safety of the NCR transportation system by relieving traffic loading from the existing deteriorating Nablubaale Bridge/Dam constructed in 1950 and,
- iii. to enhance tourism with addition of this signature iconic bridge in this picturesque location.

The Bridge was commissioned and opened by His Excellency, Gen. Y.K Museveni, President of the Republic of Uganda on Wednesday 17<sup>th</sup> October 2018.

**Summary Details of the Bridge.**

<b>BRIDGE STRUCTURAL SCHEME</b>	
<b>Bridge Length</b>	525m Length (135m + 290m + 100m)
<b>Access Road</b>	785m (Kampala Side) + 1,044m (Jinja Side)
<b>Deck Width</b>	22.9m (2x [7.0m carriageway + 2.0m walkway])
<b>Superstructure</b>	Concrete Multi-Box Girder
<b>Stay Cables</b>	Fan-shaped Single Plane Stay Cable System
<b>Pylon</b>	69m high inverted Y-shaped Pylons
<b>Foundation</b>	<ul style="list-style-type: none"> <li>• Cast-in-Situ bored piles with total length of (960m):</li> <li>• 8No. 1.5m diameter at A1</li> <li>• 18No. 2m dia. at P1 and 21No. 2m dia. at P2</li> </ul>

<b>PROJECT DATA</b>	
<b>Project Title</b>	Construction of a New Bridge Across River Nile At Jinja
<b>Contract No.:</b>	801/JNILE/WK/BRG
<b>Employer</b>	Uganda National Roads Authority (UNRA)
<b>Funded By</b>	<ul style="list-style-type: none"> <li>• Japan International Cooperation Agency (JICA) Loan No. UD-P4</li> <li>• The Government of the Republic of Uganda</li> </ul>
<b>Contractor</b>	Joint Venture of Zenitaka Corporation and Hyundai Engineering and Construction Co. Ltd
<b>Consultant</b>	Joint Venture of Oriental Consultants Co. Ltd, Eight-Japan Engineering Consultants Inc. and PyungHwa Engineering Consultants Ltd
<b>Contract Signing Date</b>	25 <sup>th</sup> November 2013
<b>Site possession date</b>	11 <sup>th</sup> April 2014
<b>Construction start date</b>	14 <sup>th</sup> April 2014
<b>Contract Period</b>	4 Years - 48 Months (1460 Days)
<b>Official Completion dates</b>	<ul style="list-style-type: none"> <li>• Original Contract: 12<sup>th</sup> April 2018 (1460days)</li> <li>• Substantially completed by: 30<sup>th</sup> September 2018 - (E.O.T)</li> </ul>
<b>Commissioning date</b>	17 <sup>th</sup> October 2018 and Opened to traffic
<b>Original Contract Price</b>	UGX: 41,174,360,580.21 USD: 112,607,084.08
<b>Payment Ratio</b>	Initially: Direct Contribution from GoU – 47% and 53% JICA - 53% Mid Construction period: JICA – 100%
<b>Compensations Value</b>	No of PAPs: 49 - Total Amount in UGX: 16,597,560,145
<b>Compensation Progress</b>	41 PAPs – UGX: 16,337,571,255 - (98.43%) Paid.

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**5 Submissions from UNRA officials, the Consultant and the Contractor on;**

**5.1 The Development of Defects and Bumps along the newly constructed Source of the Nile Bridge.**

During the meeting held on 7<sup>th</sup> February 2019, Eng. Odoch Odrua Morris, the project Engineer from UNRA in his presentation informed the Committee that on Thursday 25<sup>th</sup> Oct. 2018, some defects were observed on the import lane at the entry and exit of the bridge. These defects occurred within the period when the contractor was also collecting a baseline data for the bridge Structural Health Monitoring System.

The Committee was informed that works on the bridge structural attachments were purposely designed to improve the functionality and protect the structural surfaces of the bridge. These were completed by 30<sup>th</sup> September 2018. The bridge structural attachments include; the water proofing material with a life span of 20 years and a bridge deck asphalt concrete (ac 14) with a lifespan of 10-15 years based on the traffic characteristics, temperature and loading condition but the actual bridge structure has a lifespan of 120 years.

In order to protect the concrete bridge deck, water proofing material was introduced in between the surface of the concrete deck and the asphalt concrete (AC 14) during the design stage. Sikalastic - 822 water proofing materials was applied on the bridge deck. To facilitate bonding between the Sikalastic 822 and AC14, Sikalastic - 823 track coat was applied. Before the application of AC14, the trial test (Braking test) was undertaken on 21<sup>st</sup> September 2018 using 32 ton truck, after which, the contractor proceeded with the application of AC14.

**5.2 Physical State of the newly constructed Source of the Nile Bridge.**

An interface with the UNRA officials revealed that the structural condition of the Bridge did not have any worrying defects.

The Committee was informed that the main bridge structure would last 120 years, water proofing materials for 20 years and the Bridge Deck Asphalt for 10-15 years. The Committee was further informed that the main bridge structure is structurally sound with no single defect. However to ensure the longevity of bridge deck a 4mm synthetic waterproof membrane was used in between the concrete bridge deck to surface and 70mm thick asphalt wearing course but due to lack of proper bond, the asphalt surface course was unable to withstand the shearing force applied to it by the passage of traffic.

The mix then began to shove and move in a forward direction under the wheels of vehicles causing slippage of asphalt resulting into rutting and surface checks in areas where traffic is accelerating and decelerating due to acceleration and braking force, since these were locations where the shear force applied to the pavement is the greatest.

The Committee was informed that similar occurrences have happened in different countries around the world such as the slippage of Asphalt on the Nagoya express way in Japan, the Long Bridge in Hanoi Vietnam, Thau Phuoc Bridge over Han

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River at Da Nang, Vietnam, to mention but a few and therefore there should be no cause for alarm.

Dr. Masooki Tatsumi, the project director and in charge of supervision of the project informed the Committee that there is no perfect solution yet for the bonding of the Sikalastic materials. He further stated that the materials have to always be tested and improved due to the different weather conditions and traffic flow in different countries.

**5.3 The total cost incurred for repairs on the Bridge.**

Information received by the Committee revealed that a total of approximately **1.3 million Us Dollars** was incurred by the contractor doing the repairs to remedy the defects. The Committee was also further informed that the contractor submitted a method statement to replace the AC14 Asphalt with modified polymer asphalt and had been undertaking works on the trial section using modified tack coat as they finish the procurement and shipping process for the modified polymer asphalt.

The Committee was also informed that all costs are fully born by the contractor and any other liabilities that may surface within the defect liability period of two years from the date of commissioning will be borne by the contractor.

**6 Scope of Investigation**

**6.1 Scope (i) whether indeed there were development of Bumps along the new Bridge on River Nile, Jinja.**

The Committee on 7<sup>th</sup> day of February 2019 visited the affected sight on the new Nile Bridge. The Committee indeed found the existence of cracks, bumps and a rugged surface on the bridge that caused such an uncomfortable bumping of the vehicle while driving. The Committee also established that a number of repairs had been freshly done to cover up the most affected rugged area which had huge cracks and bumps.

**6.2 Scope (ii) The Physical state of the newly constructed Source of the Nile Bridge.**

The Committee physically accessed and inspected the Bridge to observe the physical condition of the structure of the newly constructed Source of the Nile Bridge and indeed established that physically, the main bridge structure is structurally sound and did not have any worrying defect.

The Committee also established that the import lane on the new bridge was the most affected and its surface was rugged making it unpleasant to drive due to protuberance on the surface level of the bridge. The uneven bumping effect and the cracking defects were caused due to failure of proper bonding between the asphalt concrete (AC 14) and the Sikalastic - 822. The Committee was informed that this was a new form of technology in road construction and was still being tested. The Committee also established that works were still ongoing on the trial section using modified tack coat and these trial tests are expected to go for 8 to 10

*Masooki*

*Inspector*

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*Dr. Masooki*

*Prof*

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months while awaiting the procurement and shipment of the modified polymer asphalt all at the cost of the contractor. If the tests yield successful results, the entire surface of the new bridge and on both lanes will be overhauled and worked on at the cost of the contractor.

The Committee was also informed that should the bonding between the asphalt and water proof material fail to be achieved, UNRA would revert back to the old technology where no bonding material or water proof material will be used. The implication of this would be that the life span of the newly constructed bridge would reduce from 120 years as envisaged to between 60 and 80 years.

**6.3 Scope (iii) The total cost incurred for repairs on the Bridge**

Information received by the Committee revealed that a total of approximately **1.3 million Us Dollars** was incurred by the contractor doing the repairs to remedy the defects.

Members may wish to note that the said bridge deck asphalt was meant to last for a lifespan of 10-15 years before replacement. After the occurrence of the bumps and wearing off of the asphalt used in the construction which drew media backlash from the public, UNRA and the contractor hurriedly made repair works on the affected section and also conducted tests in Nairobi to establish the cause of the defect. It is also important to note that the tests that were done in the UNRA lab in Kampala were approved by the contractor and consultant before the material was used on the bridge on inception. The Contractor informed the Committee that government did not give any specifications on the materials required to be used on the surface of the bridge.

It therefore beats the Committee's understanding that if thorough research, study and material testing was done, why did the material used on the surface of the bridge fail to withstand the conditions of the traffic in a very short time. When tasked to specify the adequate timeframe required to test the materials, the UNRA officials replied that there was no specific time that could be determined. The strength and capability of the material was based on the certification of the consultant on whether or not it could stand the conditions applied to it. This points to the possibility that the materials used were substandard or the methods of construction were not technically fit. The Committee is constrained to think that the Contractor was put in a position of compromise in the absence of specifications of the materials that could have been suitable to withstand the traffic and the weather conditions.

**6.4 Scope (iv) Other matters incidental there to.**

The Committee also interested itself in other matters incidental there to that included the following;

#### 6.4.1 Bridge illumination.

The Committee is cognizant of the objective of the project intended to enhance tourism in Jinja and the neighboring districts. The Committee observed that the bridge has been dressed with series of programmed night decorative lighting colors including the combination of Uganda National flag colors.

**The Committee noted however that the lights are only lit on special days or as planned by the management. This was attributed to the high costs that would be incurred in an attempt to light the illumination lights on a regular basis.**

#### 6.4.2 Michino-eki.

The Committee noted with concern that besides the iconic bridge type, a Michino-Eki (Roadside station) has been provided with pocket park. The structure contains a restaurant, room for bridge operation, maintenance team room for bridge structural health monitoring system, security rooms, exhibition hall and decent washrooms for the travelers.

**The Committee found it rather disturbing for such a structure of magnificent importance to Ugandans, having such complicated Japanese names would only be a total inconvenience to all Ugandans and can only be interpreted as the Country's lack of pride in its local names, languages and tradition.**

***The Committee therefore recommends that the names of these structures be changed to Ugandan local names intended to promote Uganda's traditions as the Bridge is being looked at a tourist attraction and source of pride to Uganda.***

#### 6.4.3 Bridge Structural Health Monitoring system.

The Committee noted that for the good and reliable assessment of the structural performance of the bridge, a bridge structural health monitoring system was installed on the structure to include the following.

- i. Strain gauges – for strain measurement in Girder and Pylons
- ii. Load Cells - for measuring stay cable tensions
- iii. Inclinometers – for measurement of Pylon tilt
- iv. Kumonos – for crack mapping and measurement
- v. Seismometer – for earth tremor measurement
- vi. Weather station – for measurement of weather attributes (wind speed, temperature, humidity)
- vii. Expansion joint sectors - for measurement of expansion joint movement
- viii. RTK GPS – for measurement of deflections
- ix. WIM – for vehicle axle load measurement
- x. Camera – for vehicle shape and number plate recognition.

**The Committee applauds UNRA and the Ministry of works for putting in place such modern mechanisms of collecting Monitoring data on baseline aimed at putting in place preventive maintenance measures that would help take care of a problem or defect that would be detected on the bridge in time before a worse catastrophe would happen.**

*Amir*

The Committee recommends that this system be linked to the traffic and weight bridge system to curb over loaded axles and vehicles plying the route.

**7 Attendant observations and recommendations.**

**7.1 The need to urgently sensitize the public.**

The Committee noted that the UNRA did not make enough efforts to sensitize or make a formal statement to the public in time about the defects on the bridge which inevitably sparked off a lot of social media back lash. Considering that the new bridge is a major gateway of Uganda's largest imports/exports and also the link to the Eastern region of the country, a lot of human traffic and cargo ply the route.

The Committee was informed that the efforts that UNRA put in place was to expeditiously work on the repairs on the bridge for purposes of accommodating traffic.

***It is the Committee's considered opinion that massive sensitization should always be carried out to educate the masses on such incidences to avoid politicking and also not to create panic of the possibility of the bridge collapsing.***

**7.2 The need to have transparent accountability and value for money.**

Based on investigations and test results, the project team concluded that lack of bonding between the water proofing materials and Asphalt was the major cause of the slippage. Given that this new technology had not yet been successfully applied anywhere without experiencing defects in the short term, the Committee deems it unsustainable.

The Committee observed that the consultants and contractor fell short of the task expected of them. This is because they failed to meet the technical specifications required to have the best quality materials suitable for the bridge.

***It is the opinion of the Committee that based on the knowledge and expertise of the contractor and the consultants, their competence to execute the task of constructing the bridge cannot be doubted. Some other factors relating to professional etiquette at the most top level could have come into play to explain their role in constructing a bridge whose surface could not last even just three months after its commissioning.***

***The Committee therefore recommends that government reviews the project to establish capacity and lifespan of the Bridge.***

**7.3 The need to repair and strengthen the old bridge.**

The Committee observed that there was need to repair and strengthen the old bridge as more tests and repairs are being done on the new bridge. This would go a long way in helping to reduce on the tension on the new bridge.

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**The Committee therefore recommends that UNRA steps up efforts to rehabilitate and strengthen the old Nalubaale dam bridge to accommodate traffic and also reduce on the tension on the new bridge.**

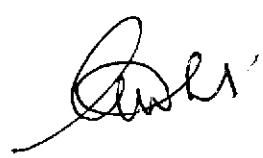
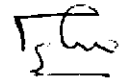
## **8 Conclusion**

The Committee feels that there was not enough detailed preliminary investigation done before the inception of the Source of the Nile Bridge project. The Committee is constrained to believe that there was laxity on the side of UNRA to closely supervise and monitor the work of the contractor on the new Bridge. Three months after the commissioning of the bridge, defects were detected due to traffic on the bridge.

The import lane on the new bridge, which is the most affected, is so rugged and this makes it unpleasant to drive due to protuberance on the surface level of the bridge. The uneven bumping effect and the cracking defects were caused due to failure of proper bonding between the asphalt concrete (AC 14) and the Sikalastic - 822. The Committee was informed that this was a new form of technology in road construction that was still being tested. Works were still ongoing on the trial section using modified tack coat and these trial tests are expected to go for 8 to 10 months while awaiting the procurement and shipment of the modified polymer asphalt all at the cost of the contractor. If the tests yield successful results, the entire surface of the new bridge and on both lanes will be overhauled and worked on at the cost of the contractor.

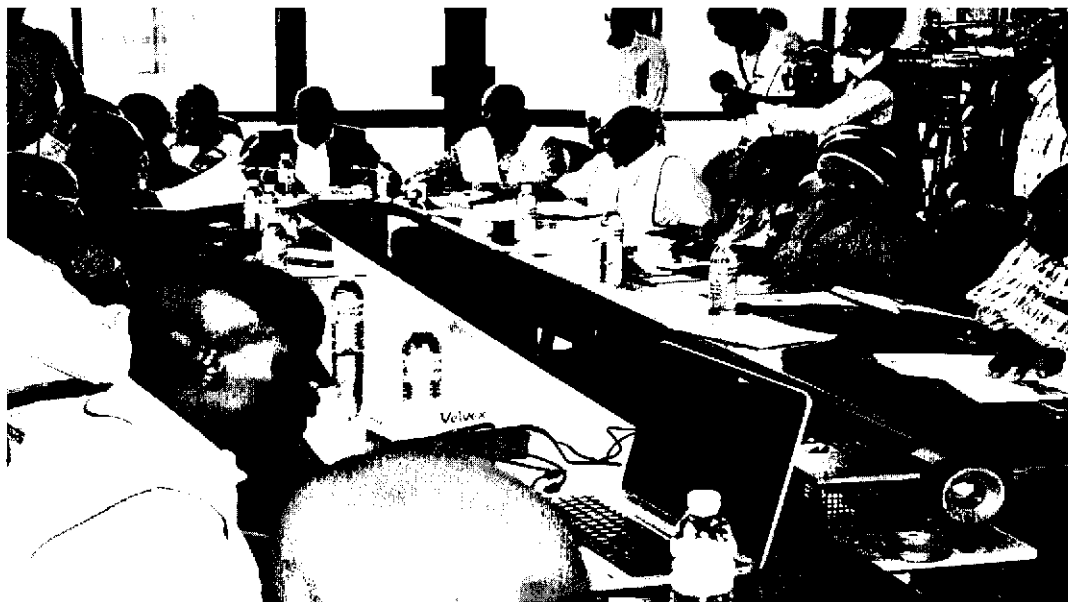
The Committee was also informed that should the bonding between the asphalt and water proof material fail to be achieved, UNRA would revert back to the old technology where no bonding material or water proof material will be used. The implication of this would be that the life span of the newly constructed bridge would reduce from 120 years as envisaged to between 60 and 80 years.

**I beg to submit.**





**Members of the Committee having light moment with contractors on the newly constructed Bridge**



**Meeting with UNRA officials, consultant and the Contractor of the Nile Bridge**

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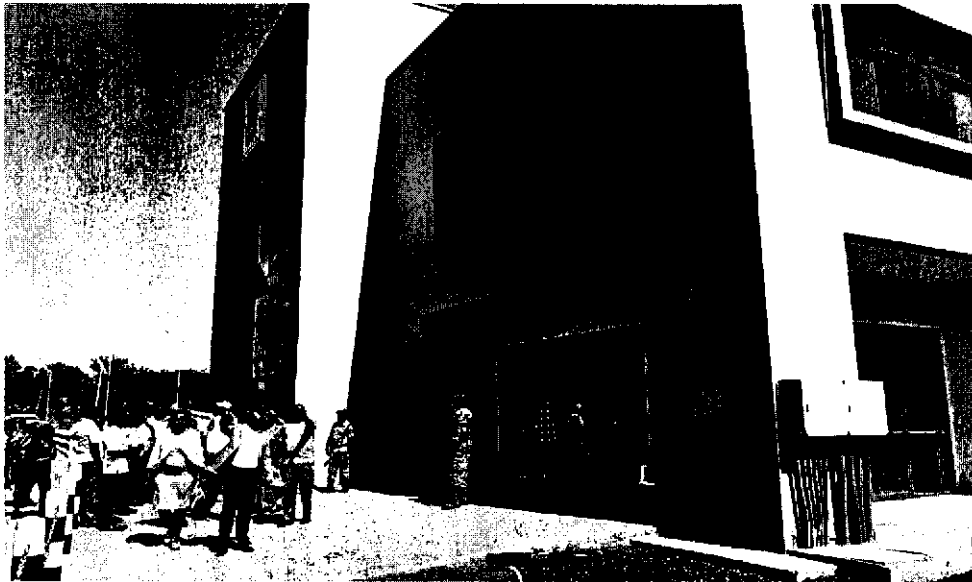
**Eng. Odoch Odrua Morris, the project Engineer making presentation to the Committee**



**Eng. Odoch Odrua Morris, the project Engineer demonstrating how the Bridge Structural Health Monitoring System works.**



**Project Contractor and Consultants responding to issues raised by the Committee**



**The Michino-Eki that houses a restaurant, room for bridge operation and maintenance team, the structural health monitoring system, security rooms, exhibition hall and decent washrooms for travelers.**

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**Signs of emerging cracks in the newly constructed Bridge shortly after not more than three months of it's commissioning.**

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## PARLIAMENT OF UGANDA

### COMPOSITION BY MEMBERS ON THE COMM. ON PHYSICAL INFRASTRUCTURE

Sn	Name	Constituency	Signature
1	Hon. Kafeero Ssekitoleko Robert, <b>CP</b>	Nakifuma County	
2	Hon. Kumama Nsamba George, <b>VC</b>	Bbaale County	
3	Hon. Angunduru Moses	Terego County West	
4	Hon. Asaba Paul Nsabimana	Kyaka County North	
5	Hon. Burundo Alex Musingo	Bulambuli County	
6	Hon. Byandala Abraham	Katikamu County North	
7	Hon. Dulu Angel Mark	Adjumani County East	
8	Hon. Guma Gumisiriza David	Ibanda County North	
9	Hon. Kasolo Robert	Iki Iki County	
10	Hon. Mandera Amos	Buyamba County	
11	Hon. Mbabazi Janepher Kyomuhendo	DWR Kagadi	
12	Hon. Mbeiza Margaret Kisira	DWR Kaliro	
13	Hon. Muhanga Margaret	Buryaha County	
14	Hon. Musoke Paul Ssebulime	Buikwe County North	
15	Hon. Mutonyi Rose Masaaba	Bubulo County West	
16	Hon. Ninsiima Boaz Kasirabo	Kooki County	
17	Hon. Othieno Okoth Richard	West Budama County North	
18	Hon. Waluswaka James	Bunyole County West	
19	Hon. Watongola Rehema	Kamuli Municipality	
20	Hon. Mwijukye Francis	Buhweju County	
21	Hon. Nzoghu William Musabe	Busongora County North	
22	Hon. Odur Jonathan	Erute County South	
23	Hon. Okupa Elijah	Kasilo County	
24	Hon. Ssempala Kigozi Emmanuel	Makindye Ssabagabo Municipality	
25	Hon. Mawanda Michael Maranga	Igara County East	
26	Hon. Ochen Julius	Kapelebyong County	
27	Hon. Okwir Samuel	Moroto County	
28	Hon. Soyekwo Kenneth Cheborion	Tingey County	
29	Hon. Tumwine Ann Mary	DWR Ntoroko	
30	Hon. Takirwa Francis [Brig.]	UPDF Representative	