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THE REPUBLIC OF UGANDA

MINISTRY OF WORKS AND TRANSPORT

APPLICATION
FOR JAPAN'S TECHNICAL COOPERATION

FEASIBILITY STUDY ON PROPOSED NEW BRIDGE ACROSS THE RIVER NILE AT JINJA

Ministry of Works and Transport
P.O Box 10
Entebbe

AUGUST 2007

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APPLICATION
FOR JAPAN'S TECHNICAL COOPERATION

- 1. Date of Entry :** Month August year 2007
- 2. Applicant :** The Government of the Republic of Uganda
- 3. Project Title :** Feasibility Study and Preliminary Design of the proposed New Bridge across River Nile at Jinja

4. Implementing Agency

Name of the Agency : Ministry of Works and Transport
(MoWT)

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5. Background

Uganda relies on its road network for the movement of over 95% of its goods and passenger traffic. A sound road transport infrastructure is therefore critical to achieving the national policy objective of a strong, private sector-led growth that contributes to economic development and poverty reduction.

75% of the road traffic in Uganda is carried on the 10,500km of National Road network which constitutes 25% of the entire network, the other comprising District and Community access roads. At present, much of road network in particular bridges remains in a deplorable state characterised by old inadequate colonial structures that can no longer meet the present and future traffic and environmental demands.

The Northern Corridor road, which runs parallel to the northern shore of Lake Victoria from the District of Kabale in the west to the District of Busia in the east on the Kenyan border, is Uganda's main transport and economic artery and is the strategic link to the Port of Mombasa, Kenya. (See location map Annex 3) In addition, it links Uganda's neighbouring countries of Rwanda, Burundi and the Eastern Part of the Democratic Republic of Congo to the Indian Ocean. This main artery crosses the River Nile at Jinja as a Class 1 road that was built on and/or as part of the construction of the Nalubaale (Owen Falls) Dam. The Dam, which is owned by Uganda Electricity Generation Company Ltd and operated by Eskom, was constructed in the 1940s and commissioned in 1954. It has since served its dual purpose of providing hydro-electricity generation capacity and a bridge-crossing (atop of or cantilevered on the dam) over the Nile River.

Justification

Presently, no viable road alternative exists to the Nalubaale crossing at Jinja. Should an event take the road bridge on the Nalubaale Dam out of service, it would cause immense disruption to the Uganda's road transport sector and economy. It would isolate the southeast of Uganda from the west and northwest of the country and from the capital and the commercial centre, Kampala. In the event of the road bridge at Jinja being out of service, goods and passengers on the Northern Corridor would have to travel north via Lira District to cross the Nile at the Karuma Dam adding as much as 500+ km for each leg of the journey.

The Structure of the Road Bridge was designed and constructed in such a way that portions of the roadway are supported either entirely directly atop of the dam or partly with half of the roadway cantilevered against the dam along the centerline and supported at the edges by concrete columns. The bridge and dam are interconnected and this poses an inevitable risk in that one affects the other. Failure of the Bridge would seriously curtail power generation whereas on the other hand, dam failure would entirely cut off the road.

In the recent past, the deck system particularly over the cantilevered section of the bridge has shown distress signs as a result of reoccurring loss of composite action between the deck slabs both in transverse between individual deck slabs and longitudinally at the edge beams. This has been further exacerbated by the increasing effects of traffic loads. As a result there is significant play of the individual slabs observable on passage of traffic, threatening deck stability. In

addition detailed underwater investigations of the bridge piers revealed severe scour action on several piers.

As a stopgap intervention, the Ministry, in 2000 and 2004 undertook repairs on the bridge, the scope of which included among others, epoxy resin injection at the soffit of the deck at the edge beam at both the east and west dam sections, plate bonding and support brackets to anchor the transverse slabs to the edge beam. The repairs included resurfacing of the bridge deck with asphalt, improvement of its drainage and repair of the side walks.

Under ideal conditions, with complete repairs to the bridge piers, traffic axle load controls and appropriate routine inspection and maintenance undertaken is it reasonably assumed that the bridge life can be extended to serve an additional 5-10yrs. The basis of this prediction is however seriously undermined by the growing traffic demand with average Daily Traffic (ADT) expected to reach 10,791 by 2010 and evidence of continued deterioration of structural components (with scour and alkali-silica reaction on concrete structural members) of the bridge. Despite the previous and planned repair efforts the fast deteriorating condition of this bridge presses Government to seek alternative bridging solutions to secure its "lifeline" link.

In 2005, the MoWT under its Road Agency Formation Unit (RAFU) undertook a World Bank financed pre-investment study for the Nile crossing at Jinja to identify viable options. The study assessed a zone of influence between Lake Victoria and Bujagali falls and screening identified two viable alignments A and B that cross the water impoundment between the Nalubaale Dam and the Railway line bridge. Three different types of bridges were technically, environmentally and financially evaluated on the alignments. The bridge types considered were: Box girders, arch (spandrel) and cable stay. Option 3 (cable stay bridge), alignment A midway on the impoundment between the Dam and the Railway bridge was recommended by the study. A copy of the study report is appended as Annex 5.

Sector Development Policy

Uganda's Development strategy enshrined within its Poverty Eradication Action Plan (PEAP) framework emphasizes the achievement of strong, private sector-led growth contribution to economic development and poverty reduction with the improvement in transport infrastructure considered as a critically important ingredient. PEAP underlines the need to improve road transport infrastructure

in order to boost production, incomes and competitiveness by linking producers to their markets and facilitating market integration.

The National Transport Master Plan (NTMP) is the transport sector's most recent comprehensive approach for transport infrastructure development and maintenance to be implemented over the 15 year plan period (2006 – 2021). The overall objective of the National Transport Master Plan is to enable Government to decide future development and financing of the transport sector infrastructure based on medium to long-term projections of international, regional and domestic transport demand. The construction of a new bridge across River Nile at Jinja marks a strategic highlight in the present to medium term Transport infrastructure needs of the Country and is prioritized under the Government's Medium Term Expenditure Framework (MTEF) for 2007/08 – 2009/10. Further, in the National Bridges Investment Plan currently under preparation construction of the proposed Nile Bridge is highly prioritized.

With the construction of the new Nile Bridge underway, Government plans to rehabilitate the old bridge in a bid to salvage the dam structure and preserve reliability for the hydro electricity generation capacity. It is intended that traffic on the old bridge shall then be restricted to pedestrian and two-wheeled vehicles while the rest of the traffic shall be diverted to the new bridge. Government will continue to uphold enforcement of axle load limits on the network, instituting a permanent or mobile weigh bridge before the proposed bridge is a viable option that shall then be considered.

6. Outline of the Project

6.1 Overall Goal

The overall project objectives is to improve communication on the Northern Corridor Route (NCR,) a major link for Uganda and its landlocked Central African neighbours by constructing a new bridge across the River Nile at Jinja, to relieve traffic loading from the existing deteriorated bridge and thereby ensure safety and reliability of NCR transportation system.

The bridge shall be strategically located in the gateway to Uganda's capital Kampala with the Nile River separating the east and central portions of the country while the Lake Victoria water body connects the three East African countries of Kenya, Uganda and Tanzania. The new bridge will unveil a unique interface at this point; between the NCR, Rail and Water (L.Victoria) transport

systems. It is envisaged that construction of a one-stop interchange terminal near the bridge will harness the three transportation systems to meet the region's future demand for movement of goods and passengers.

The structure shall constitute a signature bridge, an icon of the nation's infrastructural assets. Its picturesque features and strategic location near the source of the Nile present tourist and resort advantages that shall be further harnessed into development opportunities for the locals and the nation in general.

6.2 Project Purpose

The purpose of this project is to carry out a Feasibility Study of a new Bridge across the River Nile at Jinja.

The study shall cover but not limited to the following specific scope:

- Work with the GOU's responsible Ministries and Authorities to assess the bridge needs vis-à-vis the current and future strategic transportation requirements of the Country/ region;
- Study available reports and recommendations including the 2005 MoWT/Mott MacDonald pre-investment study;
- Identify and recommend suitable detailed bridge structure type;
- Select from available options, suitable alignment and exact location of the new bridge;
- Traffic studies, economic analysis, soils investigations and identification of material sources for proposed bridge and facilities;
- Execute preliminary design (including geotechnical, topographical and hydrological surveys and selection of suitable bridge design) and estimate cost of the selected structure for both the immediate construction and life cycle cost;
- Prepare Terms of Reference for the Detailed Design Consultant and other envisioned down stream activities;
- Guide the Client on financing and implementation strategies with a view of securing the Japan Government ODA loan for detailed design and Construction of the bridge;
- Identify and evaluate suitable management options for the operation of the bridge including toll facilities, Maintenance e.t.c in view of the prevailing institutional reforms in the sector;
- Identify suitable procurement methods for anticipated works with respect to the prevailing Donor and Client regulations; and

- Explore and evaluate land, environmental and social issues regarding the project and recommend mitigation measures.

6.1 Outputs

The expected output of this study is a recommendation to GOU on viability and implementation modalities to undertake investment in the bridge.

The study shall produce a feasibility study report complete with a preliminary design and estimated cost of the new bridge and will form a basis for continuation of the project to the next stage. It shall also detail environmental and socio-economic impacts of the proposed project.

The study shall recommend financing modalities for the bridge project with specific consideration to explore the Japan Government ODA loan option.

6.2 Project Activities

Project Activities shall include

- Preparation, application and approvals for the Study Grant;
- Procurement of Study Consultant including Preparation of Terms of Reference (TOR) , Request for Proposals (RFP), bidding and tender award;
- Project consultative meetings with stakeholders;
- Desk Study by the consultant;
- Field topographic surveys, geotechnical investigations and traffic surveys;
- Preliminary bridge design and costing; and
- Environmental Impact Assessment and approvals.

6.3 Input From Recipient Government

a) Counterpart Personnel

The Ministry shall assign technical personnel from the Roads Department to coordinate the study as follows:

Name	Current Position	Project Assignment
1. Eng. A.O. Mugisa	Ag. Commissioner Roads	Project Management
2. Eng. A.O. Orach	Principal Executive Engineer	Project Coordination
3. Eng. Bwanga	Sen. Proj Eng. (RAFU)	Project Coordination

Two project Engineers shall backstop the team in addition to specialist input from the Environmental Liaison Unit and the Central Materials Laboratory to be secured on need basis for the project. Any inherent facilitation costs shall be borne under the project.

b) Office support

The Ministry shall provide office support including office space and field transportation for the Japan-Government technical personnel. It is recognized that the consultant shall make his own arrangements for office space and transport under the study.

The Ministry shall in as much as possible, provide all available relevant data including previous study documents, maps etc related to the Study. Further, the Ministry shall secure access to the study area and facilitate liaison to other Government bodies relevant for the study. Other data to be provided include; details of existing road network, road inventory data and traffic data.

6.4 Input From Japanese Government

a) Counterpart Personnel

The Japanese Government shall provide specialist counterpart personnel on the project on part time or fulltime basis as follows:

- Project Advisor shall advise on the Japan Government conditions/ requirement on need basis.
- Bridges specialist (Long-span bridges) shall provide project Assurance for the Ministry technical team concerning the bridge, in preparation of Terms of reference (TOR) for the study and review of the consultant's technical submissions.
- Any other necessary specialist personnel.

b) Training

- It is anticipated that the Japan Government shall facilitate selected overseas training in bridge management covering aspects of design, construction, maintenance and management (including toll facilities) for counterpart project personnel.
- The Government of Japan shall in addition facilitate under the Study, stakeholder awareness seminars for Government departments, Jinja municipal authorities and people living in the vicinity of the proposed bridge site.

Implementation Schedule

Indicative dates for the project scheduling are as below:

Present Status	: The pre-investment study is complete
Finance Sourcing (JICA Grant)	: July 2007 - May 2008
Tendering for Study Consultant	: May 2008 - Aug 2008
Feasibility Study	: Aug 2008 - Aug 2009
Finance Sourcing (Japan ODA Loan)	: June 2009 - Jan 2010
For Design and Construction	

7. Implementing Agency

The Ministry of Works and Transport is the implementing Agency. The Ministry is a relatively large organization with the Roads Department alone comprising over 1300 employees at the headquarters and its 22 stations spread over the country. (*Ministry Organization Chart is attached under Annex 2*) The execution and management of projects is mainly by professional Engineers with associated project support. The project will secure a project team comprising specialists from Bridges, Materials and Roads to execute the project. Project Direction and Assurance shall be provided by the Permanent Secretary through the Ministry's Director for Engineering/ Engineer-in-Chief and Commissioners for; Roads and Quality Management. The expected number of persons from Roads Department to be secured during project implementation is shown below:

Table I Expected number of people to be involved in the project

Staff Category	Number
Project Direction	03
Project Assurance	02
Project Engineers	04
Project Support	03
TOTAL	12

Budget Allocated to the Agency

Table 2: MOWT Budget FY 2002 /2003-FY 2006/2007(Excluding Development Partners' support)

Unit: Ushs Billion

Fiscal Year	2002/0 3	2003/0 4	2004/0 5	2005/0 6	2006/0 7
1. Recurrent Budget	22.39	23.36	27.05	30.88	78.83
2. Development Budget	113.70	106.50	108.56	104.20	110.94
Total Budget	136.09	129.86	135.61	135.08	189.75

Development Budget comprises donor-supported (80%) and local-financed (20%) domestic expenditures. All figures are approved amounts by the Ministry of Finance, Planning & Economic Development (MOFED).

8. Related Activities under the Sector

The MoWT is mandated to develop and maintain transport infrastructure and services across the entire Country. In the recent past, the maintenance of national roads (11,000Km) and bridges whose custody remains the MoWT responsibility, have been funded almost entirely (100%) by GOU through annual recurrent budget allocations. The maintenance of District, Urban and Community Access Roads have also been funded by the GOU through annual District Allocations (Poverty Action Fund PAF 1,2,3 and LGDP) though donor assistance has contributed about 40% of district maintenance / rehabilitation programs. The ten year rolling Road Sector Development Program (RSDP) being implemented through the Ministry's Road Agency Formation Unit (RAFU) is currently undertaking various road development programs aimed at upgrading to bitumen standard or rehabilitation of major national roads. The RSDP is financed jointly by GOU (20%) and Donors (80%) comprising World Bank, European Union, African Development Bank, DANIDA, JICA, BADEA and others.

Table 3. Approved Budget figures for the Ministry for FY 2004/ 05 and 2005/06

Shillings Billion	FY 2004/05			FY 2005/06		
	Donor	GoU	Total	Donor	GoU	Total
<i>Road Improvement Projects</i>						
National Roads	195.1	29.7	224.8	170.2	19.3	189.5
District Roads	18.7	13.5	32.2	15.0	13.9	28.9
Urban Roads	0.0	3.1	3.1	7.3	1.5	8.8
Studies	4.7	0.2	4.9	3.1	0.3	3.4
Institutional Capacity Building	12.8	3.9	16.7	10.3	5.3	15.6
Other Sector Projects	1.6	2.3	3.9	3.6	1.2	4.8
Total	232.9	52.7	285.6	209.5	41.5	251.0
<i>Other Improvement Projects</i>						
Railways	8.0	0.0	8.0	7.4	0.0	7.4
Waterways	0.0	5.0	5.0	0.0	4.6	4.6
Housing	0.0	0.1	0.1	0.0	7.1	7.1
Total	8.0	5.1	13.1	7.4	11.7	19.1
<i>Road Maintenance</i>						
National Roads ¹⁾	4.0	69.5	73.5	0.8	73.2	74.0
District Roads	0.0	18.2	18.2	0.0	18.0	18.0
Urban Roads	0.0	4.0	4.0	0.0	4.1	4.1

	FY 2004/05			FY 2005/06		
Total	4.0	91.7	95.7	0.8	95.3	96.1
Other - recurrent						
Wage	0.0	4.7	4.7	0.0	4.0	4.0
Works, Housing, Communication	0.0	3.6	3.6	0.0	4.0	4.0
Total	0.0	8.3	8.3	0.0	8.0	8.0
MoWHC						
Grand Total	244.9	157.8	402.7	217.7	156.5	374.2

Source: MFPED

9. Environmental and Social Considerations

The Project is not expected to have considerable impact to the environment with regard to destruction/influence on related flora and fauna. During the feasibility study environmental and social impacts of the proposed bridge construction including land acquisition/ compensations e.t.c shall be examined and appropriate mitigation measures recommended and pursued. (See Annex-1; Screening format for further details)

10. Beneficiaries

Beneficiaries of the project shall include:

- Governments and population of Republic of Uganda who being landlocked depend on the NCR for connection to the sea through which over 80% of imported goods enter the country;
- Governments and People of Eastern Democratic Republic of Congo, Rwanda, Burundi and South Sudan whose livelihood depends on the NCR for the transportation of goods to and from their countries;
- Local populace living around the project area shall benefit through direct / indirect employment as a result of the project; and
- Uganda Electricity Generation Company / Eskom old Dam will be relieved from heavy traffic that has been using the road over the dam; this will extend the life of the structure.

11. Security Considerations

There is no prevailing security problem in the project area.

12. Others

The Construction of a new Bridge at Jinja is prioritized under the sector's Medium Term Expenditure Framework (MTEF) for the financial years 2007/08 – 2009/10. This is in view of the deteriorating condition of the old Nalubaale Bridge whose reliability is glaringly worsening. It is therefore the Ministry's

position that consideration be made on other options to fast track the project including but not limited to:

- a) Scope this study grant to cover both feasibility study and detailed design using one or more study consultants procured using a shortlist agreed by JICA and GOU;
- b) The financier Evaluates the Pre-investment study undertaken by GOU in 2005 (Report attached under Annex 5) for completeness/sufficiency as a feasibility study and proceed directly to applying the technical cooperation grant towards the detailed design phase.
- c) Retaining one consultant to undertake both feasibility study and detailed design under the study grant for which this application is made. Draft terms of reference for Detailed Design are attached under **Annex 4.**
- d) Guidance on the modalities and requirements to enable GOU take advantage of the Japan Government's ODA loan for the bridge construction.

ANNEXES

ANNEX.1: Screening Format

Screening Format

Question 1 Address of the Project Site

Site is Located across River Nile in Jinja District 80km east of the Capital Kampala. See Annex 1 Location of Proposed Bridge

Question 2 Outline of the project

2-1 Does the project come under following sectors?

☒ Yes ☐ No

If yes, please mark corresponding items.

- ☐ Mining development
- ☐ Industrial development
- ☐ Thermal power (including geothermal power)
- ☐ Hydropower, dams and reservoirs
- ☐ River/erosion control
- ☐ Power transmission and distribution lines
- ☒ Roads, railways and bridges
- ☐ Airports
- ☐ Ports and harbors
- ☐ Water supply, sewage and waste treatment
- ☐ Waste management and disposal
- ☐ Agriculture involving large-scale land-clearing or irrigation
- ☐ Forestry
- ☐ Fishery
- ☐ Tourism

2-2 Does the project include the following items?

☒ Yes ☐ No

If yes, please mark following items.

- ☒ Involuntary resettlement (scale: households persons)
- ☐ Groundwater pumping (scale: m³/year)
- ☐ Land reclamation, land development and land-clearing (scale: hectors)
- ☐ Logging (scale: hectors)

2-3 Did the proponent consider alternatives before request?

☒ Yes: Please describe outline of the alternatives

- ☐ 1. Continue to use the old dilapidated bridge structure
- ☐ 2. Convert railway bridge to combine both vehicular and rail traffic

3. Construct another bridge down stream or atop of the new proposed Bujagali dam due for construction.)

☐No

2-4 Did the proponent have meetings with the related stakeholders before request?

☒Yes ☐No

If yes, please mark the corresponding stakeholders.

☒Administrative body

☒Local residents

☐ NGO

☐Others ()

Question 3

Is the project a new one or an on-going one? In the case of an on-going one, have you received strong complaints etc. from local residents?

☐New ☐On-going(there are complaints) ☒On-going (there are no complaints)

☐Others { }

Question 4 Name of the law or guidelines:

Is Environmental Impact Assessment (EIA) including Initial Environmental Examination (IEE) required for the project according to a law or guidelines in the host country?

☒Yes ☐No

If yes, please mark the corresponding items.

☐Required only IEE (☐Implemented, ☐on going, ☐planning)

☒Required both IEE and EIA (☐Implemented, ☐on going, ☒planning)

☐Required only EIA (☐Implemented, ☐on going, ☐planning)

☐Others { }

Question 5

In case of that EIA was taken steps, was EIA approved by relevant laws in the host country? If yes, please mark date of approval and the competent authority.

<input type="checkbox"/> Approved: without a supplementary condition	<input type="checkbox"/> Approved: with a supplementary condition	<input type="checkbox"/> Under appraisal
--	---	--

(Date of approval: Competent authority: **National Environment Management Authority**)

☒ Not yet started an appraisal process

...Others:()

Question 6

If a certificate regarding the environment and society other than EIA is required, please indicate the title of certificate.

☐ Already certified ☐ Required a certificate but not yet done

Title of the certificate :()

☐ Not required

☐ Others ()

Question 7

Are following areas located inside or around the project site?

☐ Yes ☐ No ☒ Not identified

If yes, please mark corresponding items.

- ☐ National parks, protected areas designated by the government (coast line, wetlands, reserved area for ethnic or indigenous people, cultural heritage) and areas being considered for national parks or protected areas
- ☐ Virgin forests, tropical forests
- ☐ Ecological important habitat area (coral reef, mangrove wetland, tidal flats)
- ☐ Habitat of valuable species protected by domestic law or international treaties
- ☐ Likely salts cumulus or soil erosion areas on a massive scale
- ☐ Remarkable desertification trend areas
- ☐ Archaeological, historical or cultural valuable areas
- ☐ Living areas of ethnic, indigenous people or nomads who have a traditional lifestyle, or special socially valuable area

Question 8

Does the project have adverse impacts on the environment and local communities?

☐ Yes ☒ No ☐ Not identified

Reason: ()

Question 9

Please mark related environmental and social impacts, and describe their outlines.

- ☐ Air pollution
- ☐ Water pollution
- ☐ Soil pollution
- ☐ Waste
- ☐ Noise and vibration
- ☐ Ground subsidence
- ☐ Offensive odors
- ☐ Geographical features
- ☐ Bottom sediment
- ☐ Biota and ecosystem
- ☐ Water usage
- ☒ Accidents
- ☐ Global warming
- ☒ Involuntary resettlement
- ☒ Local economy such as employment and livelihood etc.
- ☒ Land use and utilization of local resources
- ☒ Social Institutions such as social infrastructure and local decision-making institutions
- ☒ Existing social infrastructures and services
- ☐ The poor, indigenous or ethnic people
- ☐ Maldistribution of benefit and damage
- ☐ Local conflict of interests
- ☐ Gender
- ☐ Children's rights
- ☐ Cultural heritage
- ☒ Infectious diseases such as HIV/AIDS etc.
- ☐ Others ()

Outline of related impacts:

Question 10

Information disclosure and meetings with stakeholders

9-1 If the environmental and social considerations are required, does the proponent agree on information disclosure and meetings with stakeholders in accordance with JICA Guidelines for Environmental and Social Considerations?

☒ Yes

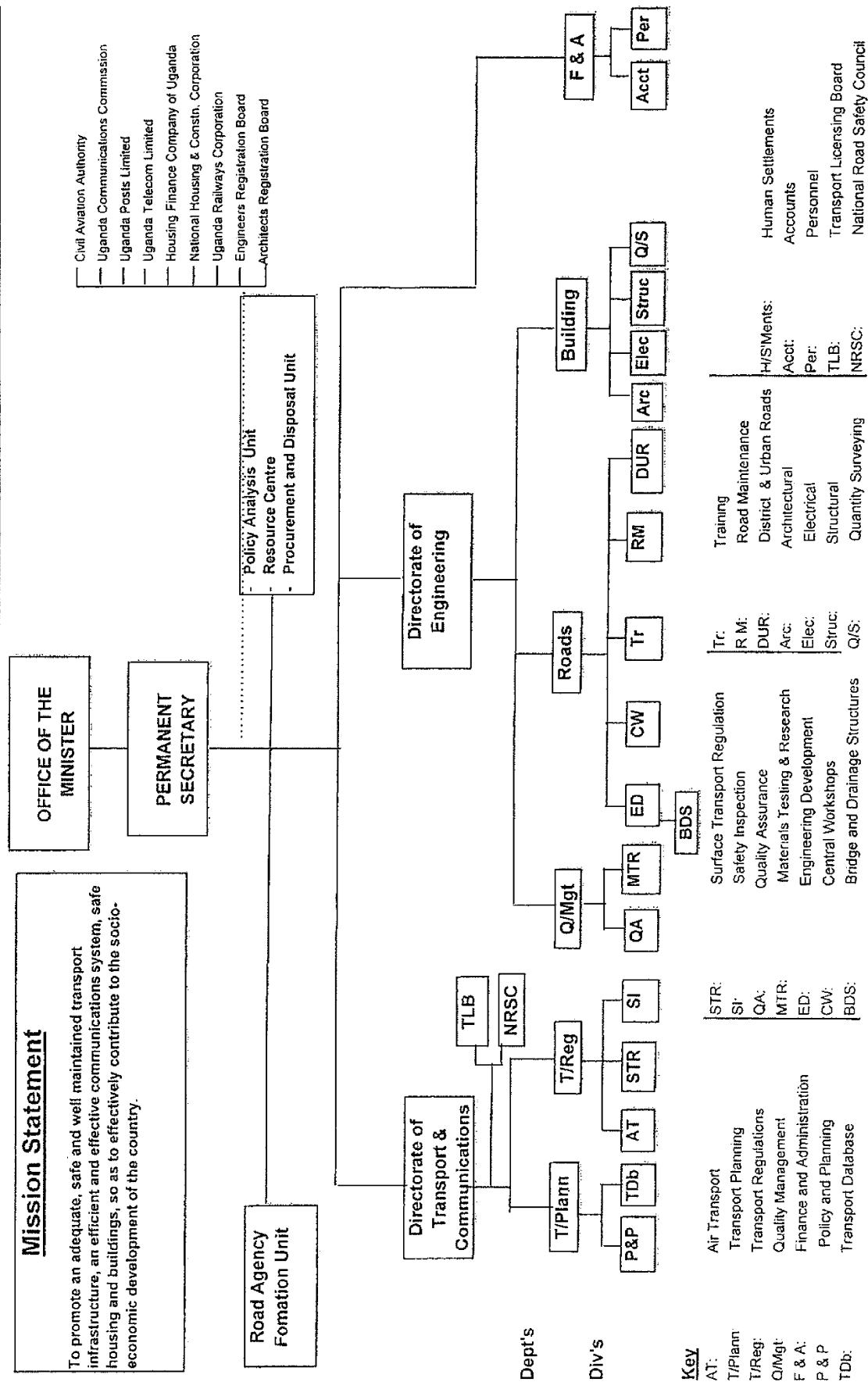
☐ No

9-2 If no, please describe reasons below.

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ANNEX.2: Organisation Chart of MoWT (the Implementing Agency)

STRUCTURE OF MINISTRY OF WORKS AND TRANSPORT UP-TO DIVISION LEVEL



ANNEX.3: Location Map of the Study Area

ANNEX.4: TOR for Design Consultant

**Terms of Reference
Consulting Services
for
Detailed Engineering Design of a Pilot Project for the
2nd Nile Bridge Crossing at Jinja**

1 Introduction

The Northern Corridor road, which runs parallel to the northern shore of Lake Victoria from the District of Kabale in the west to the District of Busia in the east on the Kenyan border, is Uganda's main transport and economic artery and is the strategic link to the Port of Mombassa, Kenya. In addition, it links Uganda's neighbouring countries of Rwanda, Burundi and the Eastern Part of the Democratic Republic of Congo to the Indian Ocean. This main artery crosses the Nile at Jinja as a Class 1 road that was built on and/or as part of the construction of the Nalubaale Dam. Construction of the dam commenced in the late 1940s and was commissioned in 1954. The Dam is owned by Uganda Electricity Generation Company Ltd (Eskom). In the 1990s, a new power canal, road bridge, intake structure, powerhouse and spillway were built as the Kiira Power Plant that is now a part and an extension of the Nalubaale Hydroelectric Plant.

Eskom does not advise as to the anticipated life of the Dam and there is a concern of the dam continuing to support the road crossing. Its structural integrity has been the concern of both Eskom and MOWHC for some years. The dam shows signs of water penetrating through the wall and alkali silica reactivity (ASR) has been occurring for some time indicates that the Dam is under stress.

During their lifetime, the Nalubaale dam, road and bridge have received minimal intervention of either routine or periodic maintenance. Recently, the Ministry of Works, Housing and Communications (MOWHC) aware of the strategic importance of this Nile crossing instigated a number of studies on the structural and functional appraisals of the bridge structure.

Presently, no viable road alternative exists to the Nalubaale crossing at Jinja. Should an event take the road bridge on the Nalubaale Dam out of service, it would cause immense disruption to the Uganda's road transport sector and economy. It would isolate the southeast of Uganda from the west and northwest of the country's the capital and the commercial centre, Kampala. In the event of the road bridge at Jinja being out of service, goods and passengers on the Northern Corridor would have to travel north to cross the Nile at the Karuma Dam adding as much as 500+ km for each leg of the journey.

2 Background

During 2003 and 2005, MOWT retained a consultant for emergency repairs of the Nalubaale Bridge. An underwater survey was performed and confirmed the deterioration of the bridges' pier columns. An axle load survey showed heavy goods vehicles (HGV) carrying 60t and a highest reading indicated a total weight of 109t. The bridge deck slab units are theoretically over stressed and are able to carry the applied loads but at a reduced factor of safety.

There is continual re-surfacing of the carriageway and minor concrete repairs to the deck slab planks. It is that consultant's opinion that with repairs to the headrace bridge piers and appropriate routine inspection and maintenance performed that the bridge could reasonably have a remaining lifespan of up to 15 years.

During 2005, the Road Agency Formation Unit (RAFU), MOWT, had a pre-investment study for the Nile Crossing at Jinja prepared to identify its viable options. The study assessed a zone of influence for the Nile Crossing between Lake Victoria and Bujagali Falls. The screening identified two viable alignments, Alignment A and Alignment B, that cross the water impoundment between the Nalubaale Dam and Uganda Railway Corporation's (URC) railway. Three different types of bridges were technically, environmentally and financially evaluated on the alignments. The bridge types considered were: box girders, arch (spandrel) and cable stay. The preferred option is the cable spay bridge (Option 2) on Alignment A midway on the impoundment between Nalubaale Dam and URC's railway. The Final Report, Pre-Investment Study, Nile Crossing at Jinja, was prepared in March 2006. In addition, the Project Brief for Option 2, Alternative A, was prepared in March 2006 for submission to Uganda's National Environmental Management Authority (NEMA).

The purpose of these TOR is to specify the tasks and duties of the consultant to assist GOU to plan and design the Nile Crossing at Jinja.

Recent traffic surveys indicated that the traffic volumes have increased at a faster rate than those forecast by the Emergency Repairs' consultant's report in 2003.

From the 2003 traffic counts it was estimated that the average daily traffic (both directions) was 6,624 vehicles with a forecast of ADT of 7,238 vehicles by 2005. The October 2005 traffic surveys indicate an ADT of 7,990 vehicles, an increase of 10% over two years and ahead of forecast. The additional axle loads induced by this traffic will further reduce the lifespan of the bridge.

3 Objectives

The overall objective of these TOR is that the consultant shall prepare a detailed engineering design including cost estimates for the Nile Crossing, a new Nile bridge for multi-wheeled vehicles. Two-wheeled vehicles and pedestrian traffic would be prohibited from using the Nile Crossing and would be restricted to the existing Nalubaale Dam road/bridge.

The specific objectives of the assignment are:

- a) Comprehensive review of all available data including the material listed below;
- b) Identify and collect additional data required;
- c) Prepare traffic, geotechnical, topographical, bathymetric, hydrographical, hydrological and geotechnical surveys required for the planning and design of the Nile Crossing;
- d) Prepare archaeological and cultural surveys for the completion of the environmental process of the Nile Crossing area to NEMA standards;
- e) Perform comprehensive technical, environmental, financial and economic review to confirm the Nile Crossing;
- f) Develop the technical analysis to internationally accepted professional standards and confirm the bridge type;
- g) Develop, submit and revise as necessary all required environmental documents to complete NEMA's environmental procedures and processes;
- h) Identify, prepare, schedule and submit all the required permits and obtain approvals necessary construction of the Nile Crossing;
- i) Develop and finalise the costs of construction of the Nile Crossing;

4 Scope of Services

The Consultant shall address its tasks and activities under this assignment to fulfil the Objectives. The Consultancy is estimated at about 44 man-months.

The descriptions below of work and activities to be performed by the Consultant shall serve to understand the tasks to be performed and be not necessarily those to be performed to fulfil the objectives above alone. It is expected that the Consultant shall describe the works, tasks, procedures and activities in their technical proposal so that they will meet the above objectives.

The following activities are the services to be provided by the consultant:

4.1 Evaluation of Existing Environment

- Investigate, study and evaluate all existing data and information relevant to Bridge Crossing at Jinja;
- Evaluate and define the traffic conditions on the Kampala-Jinja-Busia road;

- Identify if additional data for traffic, topography, river hydraulics and morphology, bathymetric and geophysical surveys, hydrology, geotechnology, demography, sociology, environment, etc are required;
- Define the traffic uses and networks as they apply to Jinja and the Nile Crossing;
- Evaluate the current bridge and road standards to:
 - modify BD 37/01 to Ugandan conditions such as wind, temperature, etc;
 - improve and make better standards;
 - enhance staging of construction;
 - reduce environmental impacts; and
 - increase economical efficiency;
- Evaluate the availability of construction materials and aggregate suitable for the Nile Crossing;
- Evaluate and determine the most technically feasible bridge options for construction as the Nile Bridge;
- Establish realistic unit prices for works for bridge and roads; and
- Define the tasks and subtasks required to operate and maintain the Nile Crossing by Government over its life cycle set in economical, financial and technical frameworks;
- Prepare network schedules and timeframes for the planning and design.

4.2 Plan and Design the Nile Crossing

- Carry out detailed site investigations on potential sites for the bridge and approach roads. The consultant shall specify in his proposal the intended investigatory methods and methods of presentation of results and conclusions in a form that can easily be verified by the client;
- Carry out a traffic analysis and economic evaluation including sensitivity analysis of the bridge options;
- Plan and design the bridge and road approaches;
- Refine the bridge design concepts, engineering drawings (A0 for the plan and profile drawings and A3 for the standard details at appropriate scales acceptable to the Client) and prepare the detailed engineering design according to internationally accepted professional standards;
- Prepare the tender dossier including confidential cost estimates according to FIDIC's standards;
- Identify and timeframe all the permits and approvals required to plan, design and build the bridge and road approaches identifying those documents that have to be submitted with for each permit, how the flow process occurs for approvals and integrate into a critical network;
- Develop public interest through involvement and educational programmes on design, environment, construction, stakeholders' inputs and aesthetics;
- Assist at the environmental screening, prepare the environmental analysis, review RAFU comments and revise accordingly.
- Identify land to be expropriated for the bridge and prepare cost estimates for land expropriation.

5 Deliverables

During the work related to these TOR, the consultant shall submit the following documents within the prescribed periods:

5.1 Inception Report (within 30 days)

Within 30 days of commencement the leaser shall prepare and submit the Inception Report. The Inception Report shall contain as a minimum the following:

- a) Define the consultant's understanding of the project;
- b) Identify and collect all of available data relevant to the Nile Crossing;
- c) Identification of additional data needed to complete the project and how, when and by whom these data collection of these data will be undertaken;
- d) Identify and schedule of manpower and resources needed to complete the objectives of the Nile Crossing project;
- e) Identify additional work and activities needed to complete the objectives of the projects;
- f) Identify and schedule the Nile Crossing reports, documents, permits and their contents;
- g) Prepare the format for the monthly progress reports;
- h) Define the programmes for involvement of Jinja, Mukono and Ugandan citizens in the environmental and design processes; and
- i) Identify other items that the consultant requires to meet the objectives of the Nile Crossing.

5.2 Interim Report 1

Within 3 months from commencement of services, the consultant shall submit Interim Report 1 that will recommend the type of bridge to be constructed for the Nile Crossing A2.

5.4 Draft Design Report

The draft detailed engineering design report shall be submitted 10 months from the commencement of services and shall contain reports on the project design, tender documents, confidential engineer's estimate and an environmental/social impact assessment reports for review by the Client. The content of these reports are outlined below:

Design Report

The project design report shall be based on the preferred bridge type in scale of 1:2000 and other as appropriate, analysis of data collected including hydrological, road safety and utility plan analysis; design of bridge and its details; fully developed schematic designs of preferred bridge type (with site plan, cross-sections, standard construction details, etc); construction specifications detailing required materials, equipment, standards and

workmanship for the work as well as the standards for the construction services required to produce the work; proposed work method statements; construction cost estimates, etc.

This report shall provide a record of the methodology of design and conclusions reached. All elements of design found to be necessary will be listed and described, with reasons given. If any additional investigation work is undertaken or required, a full description of this will be included.

Tender Documents

Prepare Tender Documents for the selected bridge type comprising both Financial and Technical documentation developed in the design of the Works. The documents will be prepared in accordance with FIDIC requirements or as appropriately advised by the Client.

Confidential Engineer's Estimate

Preparation of a confidential estimate of the cost of the completed works based on estimated bills of quantities from the draft detailed engineering design and developed unit rates. An analysis of the unit rates shall be made with the rates broken down into local and foreign costs and taxes components.

Environmental/Social Impact Assessment Report and Compensation Report

Prepare a draft environmental/social impact assessments and design mitigation measures as well as prepare preliminary cost estimates and time bound preliminary RAP related to the area under the project. All this will be in accordance to the Republic of Uganda's policies on environmental and social matters, to ensure proper and satisfactory implementation of appropriate impact mitigation measures on the Project and give a proposal on public participation along the route. In addition, the consultant will be required to collect selected social-economic data that describe Transport Poverty Observations (TPO's) in accordance to the given criteria by the Client.

A compensation report will also be prepared identifying demarcations of the project's areas of influence; identifying and quantifying compensable items therein; deriving appropriate property values; and estimating the compensation costs associated with each scheme investigated and showing the influence of the estimated compensation cost on the choice of the preferred scheme.

The consultant will also submit required maintenance procedures manuals of the designed road and bridge system.

5.6 Final Detailed Engineering Design Report

The final detailed engineering design report shall be submitted within 2 months of receipt of the Client's comments on the draft engineering design report. It shall be produced after collecting additional design information and incorporating the client's comments in the draft detailed engineering design report. The Client's comments on the draft shall be made available to the consultant with four weeks of submission of the draft design report. The report will also include the verified and approved drawings for the construction.

6 Services and Data provided by RAFU/UNRA

RAFU shall provide adequate space and facilities to study, review and comprehend all available data. RAFU will make introductions to and facilitate liaison with relevant Government Ministries, departments and other public sector organizations required for obtaining further updated information in order to execute this assignment.

6.1 Basic Information to be accessed from RAFU and other Government Agencies

- demography;
- regional and macro economy;
- GDP development;
- national current accounts and budgets;
- vehicle costs, characteristics and energy usage;
- traffic counts data;
- road networks and maintenance procedures;
- road construction procedures in Uganda;
- contractors and their capabilities in Uganda;
- engineering consultants' capabilities in Uganda;
- permitting procedures for construction in Uganda, etc.

6.2 Documentation

- studies of financing of infrastructure in Uganda and East Africa;
- technical and feasibility studies of road infrastructure;
- tender documentation of civil works in Uganda;
- governmental legislation on roads, environment and financing of road infrastructure, etc.

6.3 Current Implementation of Road Infrastructure

- cost of road development;
- financial resources
- credit and debit of RAFU;
- taxes and funding of road transport.

7.0 The Consultant will be responsible for the following:

7.1 Office and Residential accommodation

The consultant will be responsible for arranging his own office and residential accommodation, furnishing and communications during this phase.

7.2 Vehicles

The Consultants shall be responsible for arranging for his transport during this phase of the project.

7.3 Other

- (a) Employing only staff who's CV's have been approved by the Client. Replacement or temporary substitution shall not be permitted unless in emergency, or under very exceptional circumstances.
- (b) Arranging and providing supervision and the efficient and effective performance of his project staff. Particular staffing requirements are indicated in Section 8, below.
- (c) Co-operating fully with relevant Government Ministries and Departments. The analysis and interpretation of all data received and for the conclusions and recommendations based upon them.
- (d) The provision of support staff, residential accommodation, office facilities, office equipment and supplies, communication and transport for his project staff will be the consultant's responsibility during this phase.

8. PERSONNEL

The Consultant key personnel should include:

- **Study Team Leader/Civil Engineer** with a **minimum** 15 years experience of design, preparation and supervision of bridge structures. Recent experience in design of box girders, arch (spandrel) and cable stay bridge types in developing countries is required. A registered professional engineer, with at least 15 years post registration experience and experienced with use and application of computerized roads planning and operational management systems.
- **Bridge Engineer/Specialist** with **minimum** 15 years experience in the design of box girders, arch (spandrel) and cable stay bridges. Experience in developing countries will be an added advantaged. Must be a registered professional engineer, with at least 10 years post registration experience and familiar with the application of Bridge Design Codes. He/She should have prior extensive experience in the design and construction of large

bridges (spanning at least 100m) and connecting approaches, preferably in developing countries.

- **Financial Analyst** should be a Financial Analyst able to prepare financial models based on the various engineering concepts and traffic demand scenarios. Shall be required to have a minimum of 10 years of experience in bridge infrastructure project appraisal techniques, demand modeling, risk identification, mitigation tools etc. Experience in developing countries will be an added advantage. Must have been involved in at least two major road/bridge feasibility/investment studies in the African region.
- **Highway Engineering Specialist** with minimum 15 years experience of road/bridge alignment design, drainage design and pavement design. A registered professional engineer, with at least 10 years post registration experience and familiar with the application of AASHTO and TRL Design Guides as well as South African Mechanistic Design is desirable. He/she must also have proven experience in the design and supervision of bridge projects. Experience in the design of approach roads to bridge structures is required.
- **Environmental Specialist** should be qualified, with a degree in Environmental Management and Social Science Management, or a closely related discipline. The Environmentalist/Sociologist shall have a minimum of 10 years experience working on environmental management and be able to demonstrate a sound knowledge of environmental and social issues, initiatives and impact assessment and mitigation measures in developing and tropical countries. The specialist should have proven experience in impact assessment management within the road sector. Fluency in both written and spoken English and ability to communicate are essential. Experience in developing countries in general and Sub-Saharan Africa is desirable. Specific experience preparing safeguards instruments for Donor co-financed projects and knowledge of Donor operations, policies and procedures including project processing requirements, schedules and constraints.
- **Estimator** shall possess a BSC in Civil Engineering or a Diploma in Construction Technology and have a minimum of 12 years experience of practice in estimating and preparing bids for transport projects. The scheduler/Estimator shall be expected to possess wide experience with transport related infrastructure projects especially those promoted for limited recourse financial schemes. He/She should be able to demonstrate a deep familiarity with various estimating techniques and the various documentations arising from it. His/her main areas of responsibility will be to quantify and schedule resources and costs associated with the selected bridge scheme. He must have been involved in estimating at least two bridge projects with an estimated cost equivalent to at least USD 10 million.
- **Property Valuer** shall have a minimum of 8 years experience in compensation of properties associated with transport infrastructure development. He/she should be able to demonstrate a thorough understanding and appreciation of the local compensation laws and regulations and the associated Unit Costs for compensable items. He/she shall be expected to demonstrate ability to optimize projects cost by avoiding unwanted compensation requirements. His/her main areas of

responsibility shall include identification demarcating the project areas of influence; Identifying and quantifying compensable items therein; Deriving appropriate property values; and estimating the compensation costs associated with each scheme investigated and showing the influence of the estimated compensation cost on the choice of the preferred scheme.

Fluency in written and spoken English by all the above key staff is mandatory, whilst communication skills are essential.

Budget for Consultancy Services

1. Remuneration for Basic Services

Item	Input Months	Rate (US\$)	Amount (US\$)
Experts 1 - Study Team Leader	12	15,000	180,000
Experts 2 - Bridge Specialist	10	12,000	120,000
Experts 3 - Financial Analyst	5	12,000	60,000
Experts 4 - Highway Engineering Specialist	6	12,000	72,000
Experts 5 - Environmental Specialist	3	8,000	24,000
Experts 6 - Estimator	4	12,000	48,000
Expert 7 - Property Valuer	2	6,000	12,000
Sub - Total	42		516,000

2. Reimbursables

Item	Unit	No.	Rate (US\$)	Amount (US\$)
International Flights	Trip	10	2,500	25,000
Miscellaneous travel	Trip	30	250	7,500
Air Freight (mob. And demob.)	no.	1	25,000	12,500
Subsistence allowance	month	12	1,000	12,000
Drivers	month	46.8	350	16,380
Vehicles and Office equipment	PS			145,000
Materials Testing and Investigations	PS			100,000
Vehicle running costs	PS			45,000
Sub - Total				363,380

3. Miscellaneous expenses

Vehicle operational costs/insurance	veh-mon	36	450	16,200
Visa Costs	No	6	100	600
International telephone calls	months	12	100	1,170
Professional Indemnity and other insurance LS				20,000
				37,970

Sub - Total	917,350
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Contingency (5%)	45,867.50
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GRAND TOTAL	963,217.50
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**ANNEX.5: Pre- investment Study Report
(Attached)**