資料 4.(2) 討議議事録 (M/D)

2011 年 10 月 27 日

討議議事録（MD）2011年10月27日

Minutes of Discussions
on the Preparatory Survey
on the Project for Construction of Nile River Bridge
in the Republic of South Sudan
(Explanation on Draft Final Report)

In October 2010, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey Teams on the Project for Construction of Nile River Bridge to the Government of Southern Sudan, and through discussions, field surveys and technical examination of the results in Japan, JICA prepared a Draft Final Report of the study.

In order to explain and to consult with the concerned officials of the Government of the Republic of South Sudan (hereinafter referred to as RSS) on the contents of the Draft Final Report, JICA sent to RSS the Preparatory Survey Team (hereinafter referred to as "the Team"), for explaining the Draft Final Report. The team is headed by Mr. Masahiko Suzuki, Senior Transport Sector Advisor, JICA and is scheduled to stay from October 17 to October 29, 2011.

As a result of the discussions, both sides confirmed the main item described in the attached sheets.

Juba, October 27, 2011

鈴木正彦

Mr. Masahiko Suzuki
Leader, Preparatory Survey Team
Japan International Cooperation Agency

Hon. Simon Majok Majak
Deputy Minister,
Ministry of Road and Bridges

Witness

Witness

Mr. Lewis Gore George
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Amb. Kuol Alor Kuol
Undersecretary,
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Prof. Elias Nyamlell Wakoson
Deputy Minister,
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ATTACHMENT

1. Project Component
After the explanation of the contents of the Draft Final Report by the Team, RSS side agreed in principle to the project contents.

2. Responsible Organizations
Because of the reorganization of government ministries, the responsible organization has become Ministry of Road and Bridges (MRB) instead of Ministry of Transport and Road (MTR).

3. Cost Estimation

3-1. Both sides agreed that the Project Cost Estimation as attached in Annex-1 should never be duplicated or disclosed to any third parties before the signing of all the contract(s) with contractor(s) for the Project.

3-2. The Team explained to RSS side that the rough estimate of the Project Cost described in Annex-1 includes the contingency, however, the final Project Cost including the contingency described in E/N would be appraised by the Government of Japan. The contingency would cover the additional cost due to natural disaster, unexpected natural conditions, etc.

4. Japan's Grant Aid Scheme
RSS side understood the Japan's Grant Aid scheme and the necessary measures to be taken by the recipient country as explained by the Team and described in Annex-3 and Annex-4 of the Minutes of Discussions signed on October 26, 2010.

5. Schedule of the Study
JICA will complete the final report in accordance with the confirmed items and send it to RSS side around March, 2012.

6. Environmental and Social Considerations

6-1. RSS side assured to undertake Environmental and Social Considerations in conformity with EIA (Environmental Impact Assessment) and RAP (Resettlement Action Plan) report prepared. Further, it agreed to complete the EIA certification process and inform the result to JICA South Sudan office by the end of October, 2011.

6-2. RSS side agreed to protect the approach road embankment slope with sodding or other slope protection means and to undertake planting (including trees) to improve the natural environment and landscape.

6-3. Both sides agreed the contents of the Environmental Checklist as shown in Annex-2.

6-4. RSS side agreed that monitoring for Environmental and Social considerations should be conducted by MRB through contractor(s) in accordance with the Monitoring Plan for the Project described in the Preparatory Survey Report and EIA report.
The results of monitoring will be provided to JICA by filling in the Monitoring Form attached as Annex-3, during the pre- construction phase, construction phase, and after completion of the Project.

6-5. RSS side agreed that JICA will disclose the results of monitoring conducted by MRB on JICA's website and report the results of monitoring to the Advisory Committee for Environmental and Social Considerations established by JICA on a periodic basis.

7. Other Relevant Issues

7-1. Both sides confirmed that the following undertakings should be taken by RSS side at RSS expenses under the Project. The expected schedule is shown in Annex-4 and the responsible organization for each undertaking is shown in Annex-5.

(1) Removal/Relocation of existing buildings, trees and other obstacles within the Project site in accordance with the RAP report and to inform the result to JICA South Sudan office.
   i) Budget estimation for compensation by the end of November, 2011.
   ii) Decision of the relocation site by the end of December, 2011.
   iii) To start payment of compensation by the end of January, 2012.
   iv) Completion of Relocation and Compensation by the end of June, 2012.

(2) Securing and clearance of the temporary yard for the Project.

(3) Securing site for borrowing pit, quarry and disposal area.

(4) Necessary arrangement for tax exemption and custom clearance for project related equipments, materials and facilities.

7-2. Both sides agreed that the pavement structure of the approach road (approximately 3.5km) will be completed by RSS side before the target completion date of the Project. The Japanese consultant(s) and Japanese contractor(s) that are engaged in the Project, shall not be responsible for any future defects of the approach roads, and will be exempted from warranty against defect in the contract.

7-3. RSS side agreed that the completion of relocation and compensation for all utilities and PAPs is a condition of the commencement of pre-qualification under the contractor tendering procedure.

7-4. The Team explained that MRB may update the EIA and RAP report according to the comments of the Advisory Committee in Japan. RSS side agreed that any modification will be examined and the certification will be updated if necessary.

7-5. RSS side shall bear the banking commissions as a condition for the Japan's Grant Aid to be implemented, and secure the sufficient budget to cover the following cost.

(1) The commissions for the banking services based upon Banking Arrangement (B/A)

(2) The advising commission of the Authorization to Pay (A/P)

7-6. RSS side shall secure enough budget and personnel necessary for the operation and maintenance of the facilities constructed by the Project and conduct the periodical maintenance work after the completion of the Project.

Annex-1 Project Cost Estimation
Annex-2 Environmental Checklist
Annex-3 Monitoring Form
Annex-4 Schedule of Undertakings of RSS
Annex-5 Responsibility Matrix

<CONFIDENTIAL> Annex-I

Project Cost Summary

The total cost of the project which will be implemented under the financial assistance of Japanese Grant Aid and contribution from the Government of South Sudan is about _____ Yen. Cost breakdown based on the division of work between the two countries is presented below. This figure however is provisional and does not necessarily mean the upper limit for the grant referred to in the Exchange of Notes (E/N) and will be further examined when the implementation of the requested Japanese assistance is examined in a concrete manner.

(1) Japanese Contribution

The table below shows the breakdown of costs of Japanese contribution.

Cost Summary of Japanese Contribution

			Project Cost (Million Yen)
Facility	Bridge Works	Substructure Superstructure Ancillary works and approach road Temporary works Other indirect costs	
Detailed Design and Construction Supervision			
Contingency			
Total			

(2) South Sudan Contribution

Cost Summary of South Sudan Contribution

Item	Amount US$
1. Advising Commission (Bank Charges)	146,551
2. Land acquisition and relocation of house	750,626
3. Pavement and drainage work of approach road	9,085,010
Total	9,982,187

(3) Condition of Estimation

① Estimation Month/Year : March 2011

② Foreign Exchange Rate : US$ 1.00= 83.93 Yen (Exchange rate of Japanese Yen against American dollar)

: US$ 1.00= 2.44 SDG (Exchange rate of American Dollar against South Sudan Pound)

: Yen 1.00= 0.0313 SDG (Exchange rate of Japanese Yen against South Sudan Pound)

③ Construction Period : Schedule of detailed design and construction supervision is shown in the schedule of implementation

④ Others : The project is to be carried out based on the Japanese Government's grant aid scheme.

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Environmental Check Lists for Roads/Bridges

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1. Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a) N (b) N (c) N (d) Y	(a) Preparing and to be submitted in October to MOE (b) - (c) - (d) Waste is dumped at authorized site. Soil/rock are to be bought from licensed quarry operators. As for river water sampling, the proponent will get necessary approval.
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a) Y (b) Y	(a) More than 5 times of public meetings and door to door interviews of 200 households were implemented from 2010 and project consent was obtained. (b) The proponent agreed with requests from illegal residents for the provision of cheap land, house compensation and transportation of private effects although such compensations are not specified in the law.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) The site is the area where development is most urgently required and, within that area, the most technically, socially and economically feasible route has been chosen.
2. Pollution Control	(1) Air Quality	(a) Is there a possibility that air pollutants emitted from the project related sources, such as vehicles traffic will affect ambient air quality? Does ambient air quality comply with the country's air quality standards? Are any mitigating measures taken? (b) Where industrial areas already exist near the route, is there a possibility that the project will make air pollution worse?	(a) Y (b) N	(a) Air quality will be improved in the vicinity of the existing bridge and although air pollution level complies with the international standards in 2015, it doesn't in 2025 unless the road network is improved. Before 2025, the urban road network will be improved and traffic congestion will be relieved with less emission. (b) No industrial area in Juba that can affect air quality
	(2) Water Quality	(a) Is there a possibility that soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling will cause water quality degradation in downstream water areas? (b) Is there a possibility that surface runoff from roads will contaminate water sources, such as groundwater? (c) Do effluents from various facilities, such as parking areas/service areas comply with the country's effluent standards and ambient water quality standards? Is there a possibility that the effluents will cause areas not to comply with the country's ambient water quality standards?	(a) Y (b) N (c) Y	(a) There is no cut portion. Fill near the river is protected from erosion. Muddy water is once pooled in sediment ponds/tank before being discharged to the river. (b) Groundwater can be contaminated by inflow of muddy water through outcropped rock, into ground. However there no well at the out crop area. (c) Liquid waste from workers camp is dumped at the official dumping site.

- : Not Applicable

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
	(3) Wastes	(a) Are wastes generated from the project facilities, such as parking areas/service areas, properly treated and disposed of in accordance with the country's regulations?	(a) Y	(a) Solid waste is generated from the workers camp and is properly dumped at the official dumping site
	(4) Noise and Vibration	(a) Do noise and vibrations from the vehicle and train traffic comply with the country's standards?	(a) Y	(a) It may become greater than standard during construction in the area facing the road. Monitoring will be implemented and noise prevention barrier is installed if necessary.
3. Natural Environment	(1) Protected Areas	(a) Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) N	(a) -
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem? (d) Are adequate protection measures taken to prevent impacts, such as disruption of migration routes, habitat fragmentation, and traffic accident of wildlife and livestock? (e) Is there a possibility that installation of roads and bridges will cause impacts, such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystems due to introduction of exotic (nonnative invasive) species and pests? Are adequate measures for preventing such impacts considered? (f) In cases the project site is located at undeveloped areas, is there a possibility that the new development will result in extensive loss of natural environments?	(a) N (b) N (c) N (d) N (e) N (f) N	(a) - (b) - (c) - (d) - (e) - (f) -
	(3) Hydrology	(a) Is there a possibility that alteration of topographic features and installation of structures, such as tunnels will adversely affect surface water and groundwater flows?	(a) N	(a) -

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
	(4) Topography and Geology	(a) Is there any soft ground on the route that may cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides, where needed? (b) Is there a possibility that civil works, such as cutting and filling will cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides? (c) Is there a possibility that soil runoff will result from cut and fill areas, waste soil disposal sites, and borrow sites? Are adequate measures taken to prevent soil runoff?	(a) N (b) N (c) N	(a) Based on the results of boring, the ground is confirmed to be generally firm. There is no possibility of collapse in fill since proper slope angles and depths are considered. (b) Excavation in the river will be made using be steel pipe sheet pile cofferdam. (c) -
4. Social Environment	(1) Resettlement	(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement? (b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement? (c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement? (d) Are the compensations going to be paid prior to the resettlement? (e) Are the compensation policies prepared in document? (f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples? (g) Are agreements with the affected people obtained prior to resettlement? (h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan? (i) Are any plans developed to monitor the impacts of resettlement? (j) Is the grievance redress mechanism established?	(a) Y (b) Y (c) Y (d) Y (e) Y (f) Y (g) Y (h) Y (i) Y (j) Y	Replies to questions (a) through (j) are detailed in RAP. The followings outlines the replies: (a) The route is chosen with the least number of households affected which is the most technically and economically feasible. (b) It will be explained when the compensation policies have been finalized. (c) Value Assessment, Compensation and Resettlement Committee (VACRC) is established and census, assets survey, market price survey will be implemented. (d) Payment is scheduled before relocation. (e) They are indicated in the entitlement matrix. (f) Food and medical care cost (1 month income) is provided for vulnerable group. (g) Presently one household is reluctant for relocation, but persuasion is continued. (h) New committees will be established and the proponent will secure enough budget for compensation. (i) Both internal and external monitoring will be implemented. (j) Grievance committee which includes the representative of affected tribes will be established.
	(2) Living and Livelihood	(a) Where bridges and access roads are newly installed, is there a possibility that the project will affect the existing means of transportation and the associated workers? Is there a possibility that the project will cause significant impacts, such as extensive alteration of existing land uses, changes in sources of livelihood, or unemployment? Are adequate measures considered for preventing these impacts? (b) Is there any possibility that the project will adversely affect the living conditions of the inhabitants other than the target population? Are adequate measures considered to reduce the	(a) Y (b) Y (c) Y (d) N (e) N (f) N	(a) Shop keeper who loses shop is provided with shop loss allowance. Farmers, who lost farm are provided alternative farm lands or replacement cost. (b) Residents who may lose their job are employed at the construction site with priority. (c) Provision of safety measures, goods and prevention campaigns are planned. (d) The objective of the road project is to improve the road network and therefore improve the traffic flow in the surrounding areas. Intersections will properly consider traffic movement and

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Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		impacts, if necessary? (c) Is there any possibility that diseases, including infectious diseases, such as HIV will be brought due to immigration of workers associated with the project? Are adequate considerations given to public health, if necessary? (d) Is there any possibility that the project will adversely affect road traffic in the surrounding areas (e.g., increase of traffic congestion and traffic accidents)? (e) Is there any possibility that roads will impede the movement of inhabitants? (f) Is there any possibility that structures associated with roads (such as bridges) will cause a sun shading and radio interference?		safety facilities installed along the road. (e) Intersections are properly designed to allow safe motorized and non-motorized movements. Shoulders and sidewalks are provided for safe movement of non-motorized transport, including pedestrians. (f) Only the section directly below the approach bridge deck will experience sun shading but it is within the project right-of-way.
4. Social Environment	(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a) N	(a) -
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) The bridge form will add value to the existing landscape and will become symbolic to Juba.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources to be respected?	(a) Y (b) Y	(a) Integration of host community and relocated community is planned. (b) Alternative relocation sites of similar environment and cultural background are identified for project affected persons. Affected cemetery will be relocated in accordance with local ceremony.
	(6) Working Environment	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? (d) Are appropriate measures being taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(a) Y (b) Y (c) Y (d) Y	(a) Compliance with the law is the first priority policy of EMP. (b) Health and safety plan for employees and residents are planned properly and secured. (c) Safety education, including how to use safety materials, equipment and facilities and how to behave in emergency case, are to be implemented. (d) Security guard is chosen after his background and experience is sufficiently checked.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
5. Others	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)? (b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts? (c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	(a) Y (b) N (c) N	(a) Monthly meeting will be held to monitor the complains about construction. Based on the meeting, mitigation measures are taken when necessary. (b) Impact to ecosystem is negligible and, for improvement of landscape, the vegetation/sodding on the embankment slope and river bank is promoted (c) Impact can be considered to be mitigated and public meeting is continued.
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(a) Y (b) Y (c) N (d) Y	(a) The contractor implements monitoring under the supervision of proponent. (b) Scheduled before, during and after construction for air pollution, noise and vibration, water pollution and social conditions of affected people as indicated in the monitoring plan in EIA. (c) Only one specialist is available and without any equipment. However, proponent is going to request enough budget from the government to fulfill the requirement of JICA Environmental and Social Considerations Guidelines as much possible. (d) The monitoring report, as discussed in the EIA, will be submitted to JICA every month.
6. Note	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Forestry Projects checklist should also be checked (e.g., projects including large areas of deforestation). (b) Where necessary, pertinent items described in the Power Transmission and Distribution Lines checklist should also be checked (e.g., projects including installation of power transmission lines and/or electric distribution facilities).	(a) N (b) N	(a) No forest at the site (b) -
	Note on Using Environmental Checklist	(a) If necessary, the impacts to transboundary or global issues should be confirmed, if necessary (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a) Y	Prediction of emission of CO2 were implemented in 2015 and 2025 respectively and results was found as the emission amounts will be halved by the implementation of the project in 2015 and 2025 respectively

1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located differ significantly from international standards, appropriate environmental considerations are required to be made. In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).
2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

Annex 3

Monitoring Form

1. Permission and Public Meeting

Items	Contents
The proponent will obtain the permission for river water sampling	Date of approval
Public meeting	Date, participants, subject, opinion

2. Pollutions

－Ambient Air Pollution Around the Site, 2 times per year between 2012-2018 Item	Unit	Nile Bridge Road		Juba Bridge Road		Tentative standards
		Beside road *	200m behind road	Beside road *	200m behind road	
Sulphur dioxides SO_2	μg/m3					WHO 20-125 (daily) 500 (10min)
Nitrogen dioxides NO_2	μg/m3					WHO 40 (yearly) 200(hourly)
Carbon monoxide CO	μg/m3					Japan 2000(8hours)
Suspended Particulate Matter SPM	μg/m3					Japan 100(daily) 200(hourly)
Dust	μg/m3					Japan 600
Noise	dB					Japan 70 (Daytime) 65 (Nighttime)
Vibration	dB					Japan 70 (Daytime) 65 (Nighttime)
Traffic volume	No./ hour					-

*: Boundary between private and public/road areas

For sensitive areas (school, hospital and church), the limits shall be 60dB in daytime and 55 dB in nighttime for noise and vibration respectively.

－Maintenance of Equipment by Exhaust Gas Detector During Construction

Item	Equipment 1	Equipment 2		Standards
NO x				
CO				

－Dust Suppression Plan During Construction

Item	Confirmation	Standards

Accesses		Spray of water 5 times daily in dry season
Stock piles		Water spray/covering with
Earth transport lorries		Covering with tarpaulin and prohibiting overloading

－Water Quality（Environmental Water Around the Site During Construction）

Item		Unit	200m downstream from Nile Bridge	200m upstream of Nile Bridge	Well at the site	Standards
Hand held type simple monitoring every month during construction	pH	-				6.5-8.5
	Turbidity	NTU				<5 NTU
	Electric Conducti-vity Ec	μS/cm				<2000 (Environmental Protection Agency, USA)
	Dissolved oxygen DO	mg/L				>2 (Japan)
Sampling and laboratory analysis 2 times before and during construction and 3 years after construction	SS	mg/m3				<50or <100 (Japan)
	Coliform	group/ 100mL				Not detected
	Oil	mg/L				0.5mg/L (Japan)

－Control of Muddy Water/Excavated River Bed Material During Construction

Item	Situation
Installation of sediment ponds/tanks	
Approximate volumes of liquids brought in ponds/tank	
Sedimentation control	

－Waste Management During Construction

Item	Situation
Date of collection, types of waste (solid/liquid), volume/weight,	

－Vegetation of the Embankment Slope During Construction

Item	Situation
Date of seeding, area, growth condition	
Area covered	

3. Health and Safety During Construction

Item	Situation
Records of safety/health activities, accident reports	
Record of clinic activities and number of patients	

4. Social Environment

－Involuntary Resettlement

Item	Situation
Sample interviews about resettlement activities implemented (census, asset inventory, contract, payment, relocation site preparation, private assets transportation) per every three months、4 times in total in 2012	

－Life and Livelihood Levels

Item	Situation
Sample interviews about occupation, income, education and integration with surrounding communities one time in 2013, 2014 and 2015 respectively	

Undertaking of South Sudan

1. Resettlement Activity

Resettlement activities to be conducted by South Sudan Government is described as following table:

Activity	Responsible Agency	2011								2012							
		9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1. Approval of RAP	MOE		●														
2. Detailed Asset Survey and Compensation Estimation	IMC - VACRC		●	●													
3. RAP Budget · Submission · Approval	MRB		●		 ●												
4. Decision of Relocation Site	MRB				●												
5. For Legal Residents (Formal) · Contracting for Compensation · Compensation Payment · Site Preparation (Demarcation) · Relocation of Residents	 MRB MRB MOPI MOPI				 ●	 ●	 ●	 ● ●	 ●	 ●	 ●						
6. For Illegal Residents (Informal) · Contracting for Compensation · Compensation Payment · Identify Relocation Site · Relocation of Residents	 MRB MRB MOPI MOPI				 ●	 ●	 ●	 ● ●	 ●	 ●	 ●						
7. Completion of Relocation	MRB										●						
8. Grievance Redressing	IMC-GRC			●	●	●	●	●	●	●	●	●					
9. Site Clearing for Alignment ROW	MOPI/MRB											●	●				
10. Possible Bidding Date	-													●			
11. Possible Start of Construction	-														●		

Notes: 1. Abbreviations:

- MOE · Ministry of Environment
- IMC · Inter-Ministry Committee for Nile River Bridge Construction Project, RSS
- VACRC · Value Assessment, Compensation and Resettlement Committee
- MRB · Ministry of Roads and Bridges, RSS
- MOPI · Ministry of Physical Infrastructure, CES
- GRC · Grievance and Redressing Committee
- JICA · Japan International Cooperation Agency

2. JICA will provide technical support for the RAP Activities.

2. Pavement Works

Pavement works for approach road to the proposed Nile river bridge shown in the following table is to be completed by South Sudan Government with road drainage works.

Approach Road Works	Distance	Contents
Pavement	3.565 km	Sub-base course, base course and surface pavement
Drainage	7.23 km	Concrete ditch

Project for Construction of Nile River Bridge in the Republic of South Sudan

Responsibility Matrix

Items		Target Date	Responsible Agency						
			GOJ	RoSS	MRB	MOPI	MOE	Commu-nity	IMC
1. Project Scope	• 560m two-lane Bridge	End of 2015	◎						
	• 2x50m PCCP Approach Road (1)	End of 2015	◎						
	• 3.6km Access Road (for Construction)	End of 2015	◎						
	• 3.6km AC Approach Road (2)	End of 2015		○	◎				
	• Road Drainage	End of 2015		○	◎				
2. Project ROW and Permits/ Clearances	• Secure Budget for ROW & RAP	Dec 2011		○	◎				
	• Project ROW Acquisition (30m wide route corridor)	End of June 2012			◎	○		○	○
	• Project Site Preparation and Clearance (removal of existing buildings, trees, obstacles, removal/relocation of utilities, etc.)	End of July 2012			◎	◎		○	
	• Clearance for Temporary Construction Yard	Before Construction			◎	○		○	
	• Permits for Borrow Pit, Quarry, River Water Usage, Disposal Area, etc.	Before Construction			◎	○	○	○	
3. RAP	• RAP Approval	Oct 2011			○		◎		
	• Detailed Asset Survey and Compensation Estimation	Nov 2011			○	○			◎
	• RAP Budget (Preparation & Approval)	Dec 2011		○	◎				
	• Compensation Agreement with PAPs	Dec 2011			○	○			◎
	• Payment of Compensation	Jan-Mar 2012			◎				○
	• Relocation Site Preparation	Feb-Mar 2012			○	◎		◎	○
	• Relocation of PAPs	Mar-Jun 2012			○	◎		○	○
	• RAP Monitoring	During RAP activities until after Resettlement			◎		○		◎
4. EIA	• EIA Approval	Oct 2011			○		◎		
	• Monitoring for Environmental and Social Consideration	Before, During and After Construction			◎		○		○
5. Bank Arrangement	• Bank Account and Bank Charges for Grant (Commission for Banking Arrangement and Authorization to Pay)	Before and during Construction		◎	○				
6. Tax Exemption and Clearances	• Customs clearance and tax exemption for imported items related to project	During Construction		◎	○				
	• Tax exemption of Japanese nationals from customs duties, internal taxes and other fiscal levies for the supply of products and services	During Construction		◎	○				

Notes:
◎ - Major role/responsibility
○ - Secondary role/responsibility
GOJ - Government of Japan
RoSS - Republic of South Sudan
MRB - Ministry of Roads and Bridges, RoSS
MOPI - Ministry of Physical Infrastructure, CES
MOE - Ministry of Environment, RoSS
IMC - Inter-Ministry Committee for Nile Bridge Construction

資料 5.(1) テクニカルノート

2010 年 11 月 11 日

テクニカルノート 2010 年 11 月 11 日

Technical Notes

(The First Site Survey)

The JICA Study Team for the Preparatory Survey (the Study Team) and the representative of the Ministry of Transport and Roads (MTR) which is the responsible and implementing organization for the Project for Construction of Nile River Bridge (the Project) have agreed upon the items described in the attached Technical Notes, with witnesses of representatives of concerned Ministries. Based on the Technical Notes, the Study Team will analyze and discuss the First Site Survey results with authorities concerned in Japan to justify the Project and determine its scope.

November 11, 2010 in Juba

Dr. Shingo GOSE
Chief Consultant
JICA Study Team

Mr. Jacob Marial Maker
Director General
Ministry of Transport and Roads
Government of Southern Sudan

Witness

Mr. Lewis Gore George
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Witness

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Ministry of Environment
Government of Southern Sudan

Witness

Mr. Otim Bong Mike
Deputy Director
Ministry of Transport and Roads
Government of Southern Sudan

Technical Notes for the First Site Survey

1. Engineering Aspects

1.1 Cross Sections

- The cross-section elements for the bridge component and the road component of the project are to be the ones shown in the Figures in **Annex-1**.
- The GOSS will complete the approach roads as shown in Figure1-1 of Annex-1 by utilizing the temporary construction access roads as shown in Figure1-2 of Annex-1.
- The temporary construction access roads during construction will be developed with gravel roads.
- The bridge cross section is shown in Figure 1-3 of Annex-1.

1.2 Bridge Location and Approach Road Route Alternatives

- Candidate bridge locations and approach road routes are shown in **Annex-2**.
- Based on the discussions with the concerned agencies of GOSS and analysis of the survey results, the most appropriate alternative will be recommended through discussions with JICA in Japan.

1.3 Navigation/Vertical Clearances

- There is no navigation clearance requirement in the proposed site location of the bridge.
- The vertical clearance, which is between the girder soffit and the highest water level in fifty years, stipulated in "Bridge Design Manual, 2006" (MTR) is to be used as the basis for the design.

2. Related Projects

2.1 Road Development Projects

- The GOSS side understood the importance of road development projects related to the Nile River Bridge Construction and presented the programs including those implementation schedules as shown in **Annex-3**.

2.2 Land Development Projects

- The proposed C-3 approach road on the west side will be incorporated into the present land demarcation and development program of the Central Equatoria State Ministry of Physical Infrastructure, as shown in **Annex-4**.

3. Environmental and Social Considerations (ESC) Aspects

- The GOSS side promised to take necessary measures for Environmental and Social

Considerations following the process and its time frame shown in **Annex-5**..

- A Value Assessment Committee (VAC) will be formed by the time shown in **Annex-5** in order to consult together and determine appropriate compensation prices. The VAC shall be composed of the representatives from the Ministry of Transport and Roads (MTR, GOSS), the Ministry of Environment (MOE, GOSS), the Southern Sudan Land Commission (SSLL, GOSS), the Ministry of Physical Infrastructure (MOPI, CES), the Ministry of Agriculture and Forest (MOAF, CES), Southern Sudan Center for Census, Statistics and Evaluation (SSCCSE), Ministry of Finance (MOF), NGOs and the concerned Communities.
- The GOSS side understood the recommendation of the Study Team that the Inter-Ministerial Monitoring Committee (IMMC) is to be established in order to undertake and monitor the legal framework of ROW acquisition, the RAP and Resettlement activities, and the implementation program of the road development projects related to the Nile River Bridge construction.

4. Application of Stage ROW Acquisition
    - To enhance project cost effectiveness and reduce budgetary requirements from initial project costs, the ROW acquisition including compensation shall be undertaken by phasing following the process shown in **Annex-6**.

Annex-1

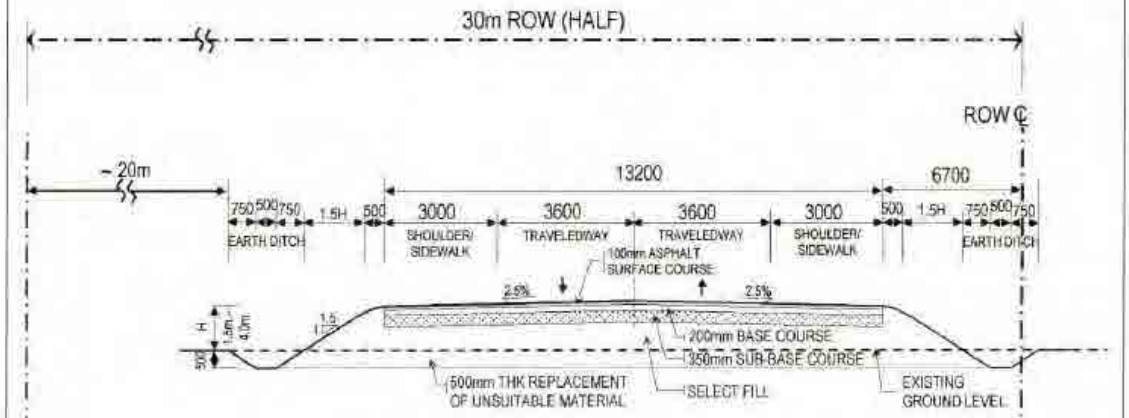


Figure 1-1 Approach Road

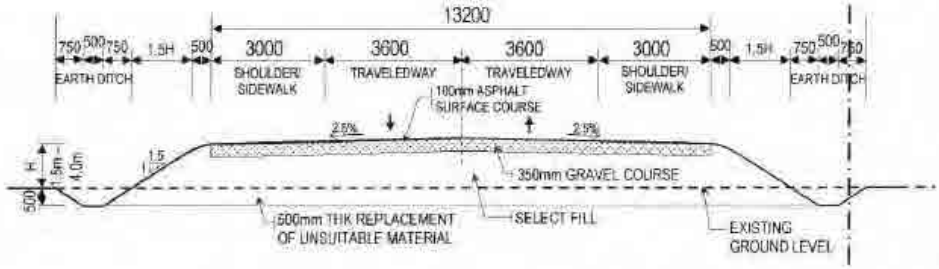


Figure 1-2 Temporary Construction Access Road

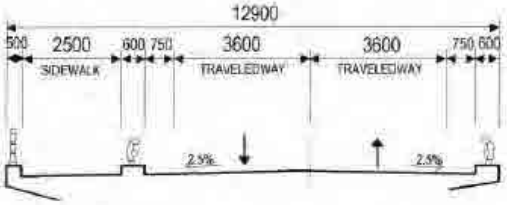
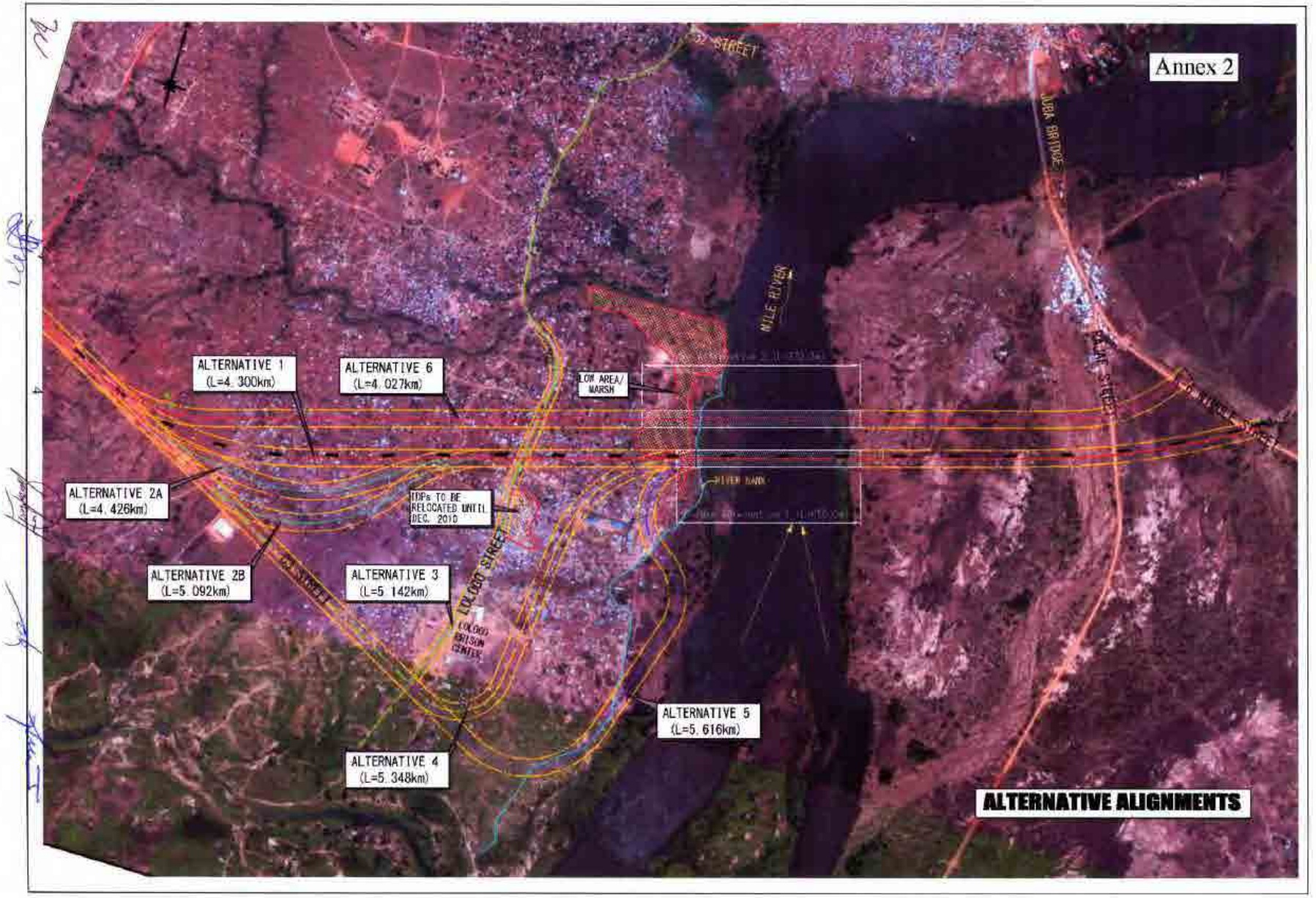


Figure 1-3 Bridge Section

Road and Bridge Cross-Section


Annex 2
NILE RIVER
JUBA BRIDGE
ALTERNATIVE 1
(L=4.300km)
ALTERNATIVE 6
(L=4.027km)
LOW AREA/
MARSH
ALTERNATIVE 2A
(L=4.426km)
IDPs TO BE
RELOCATED UNTIL
DEC. 2010
ALTERNATIVE 2B
(L=5.092km)
ALTERNATIVE 3
(L=5.142km)
LOLOGO STREET
ALTERNATIVE 5
(L=5.616km)
ALTERNATIVE 4
(L=5.348km)
ALTERNATIVE ALIGNMENTS

資 5(1)-5

Annex-3

Status of Road Development Projects Related to Nile River Bridge Construction

Projects (refer to **Appendix-1**)		Descriptions	Expected Funds	Planned Schedule
1. **Nile River Bridge Approach Road** (A-B and C-D Sections)		• Asphalt pavement for 2-lane road utilizing the temporary access roads for Nile River Bridge Construction. • Improvement of side ditches.	GOSS (Temp. access road – Japan)	Refer to **Appendix-2**
2. **C-3 Road Improvement** (D-E Section)		• Gravel road is almost completed. • Remaining works are asphalt pavement, installment of a bridge and side ditches improvement.	Sudan*1)	
3. **Lologo Street Improvement** (H-I Section)		• Widening, grading and resurfacing including alignment improvement • Asphalt pavement	GOSS	
4. **C-2 Road Improvement** (F-G Section)		• Widening, grading and resurfacing including alignment improvement • Asphalt pavement	GOSS	
5. **Nyakuron Street Construction** (F-J Section)		• 2-Lane road construction	GOSS	
6. **Collector/Market Street Improvement** (K-O Section & M-N Section)		• 4-Lane gravel road is almost completed. • Installation of a 2-cell box culvert • Partial 2-lane asphalt road completed • Asphalt pavement	Sudan*1)	
7. **C-3 – R-1 Road Improvement**	E-M Section	• 4-Lane gravel road is completed. • 2-lane asphalt pavement completed • Remaining 2-lane asphalt pavement	Sudan *1)	
	M-P Section	• 4-lane asphalt pavement completed for Section O-P • RC Pipe drainage works • 4-lane asphalt road construction for Section M-O	Sudan *1)	
8. **R6 Juba-Nimule Road Project** (A to Nimule Section)		• 2-lane asphalt pavement (192kms). On-going. • 8 bridges completed.	USAID	
9. **Juba Urgent Road Improvement Project**		• 50kms of asphalt pavement completed (total length = 65kms). On-going.	GOSS	
10. **R-1 Road Improvement** (E to Kaya Section)		• 2-lane asphalt pavement (245kms). • F/S & D/D on-going	World Bank/ MDTF	

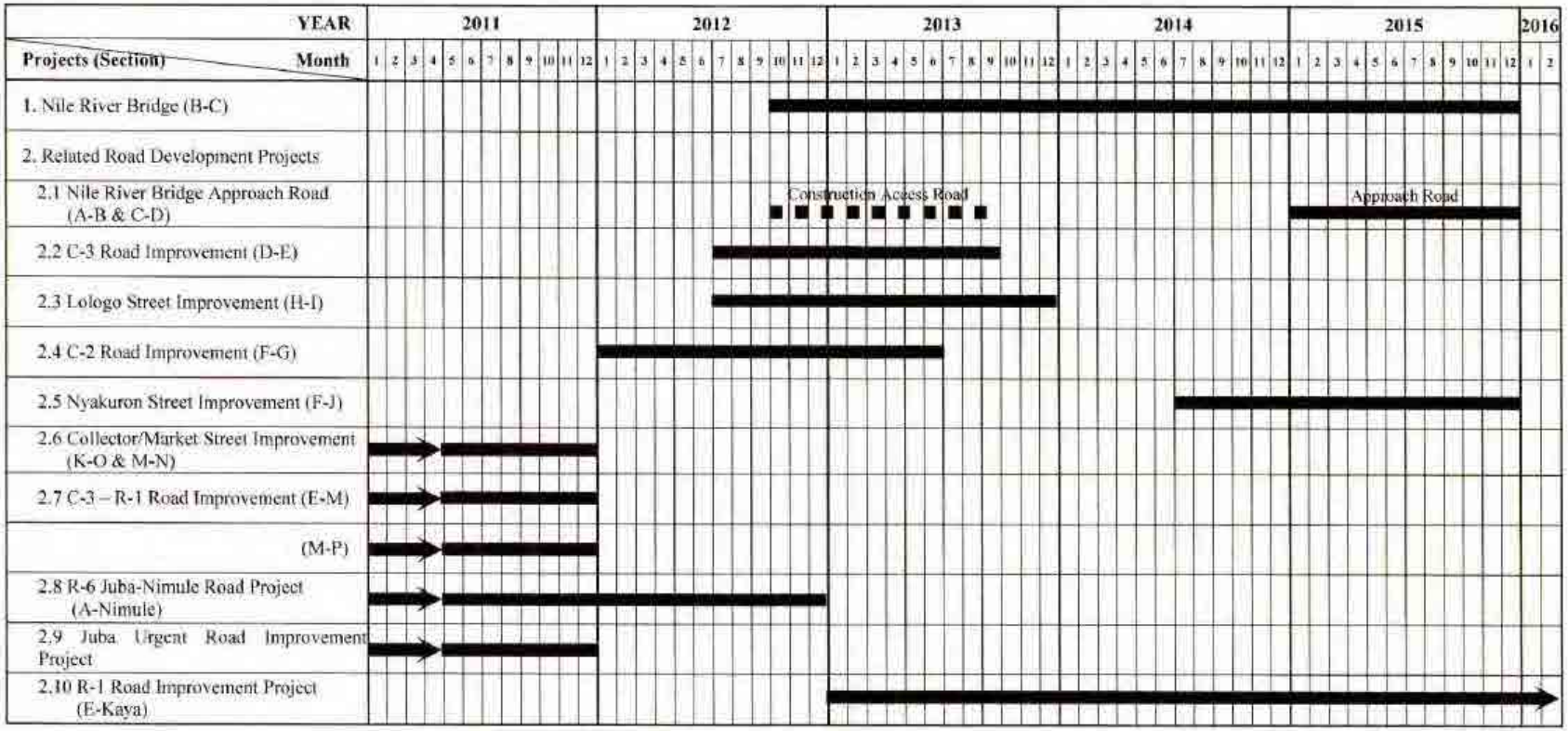
*1) Forms part of the 20kms Sudan Government Road Project.

Annex-3: Appendix 1

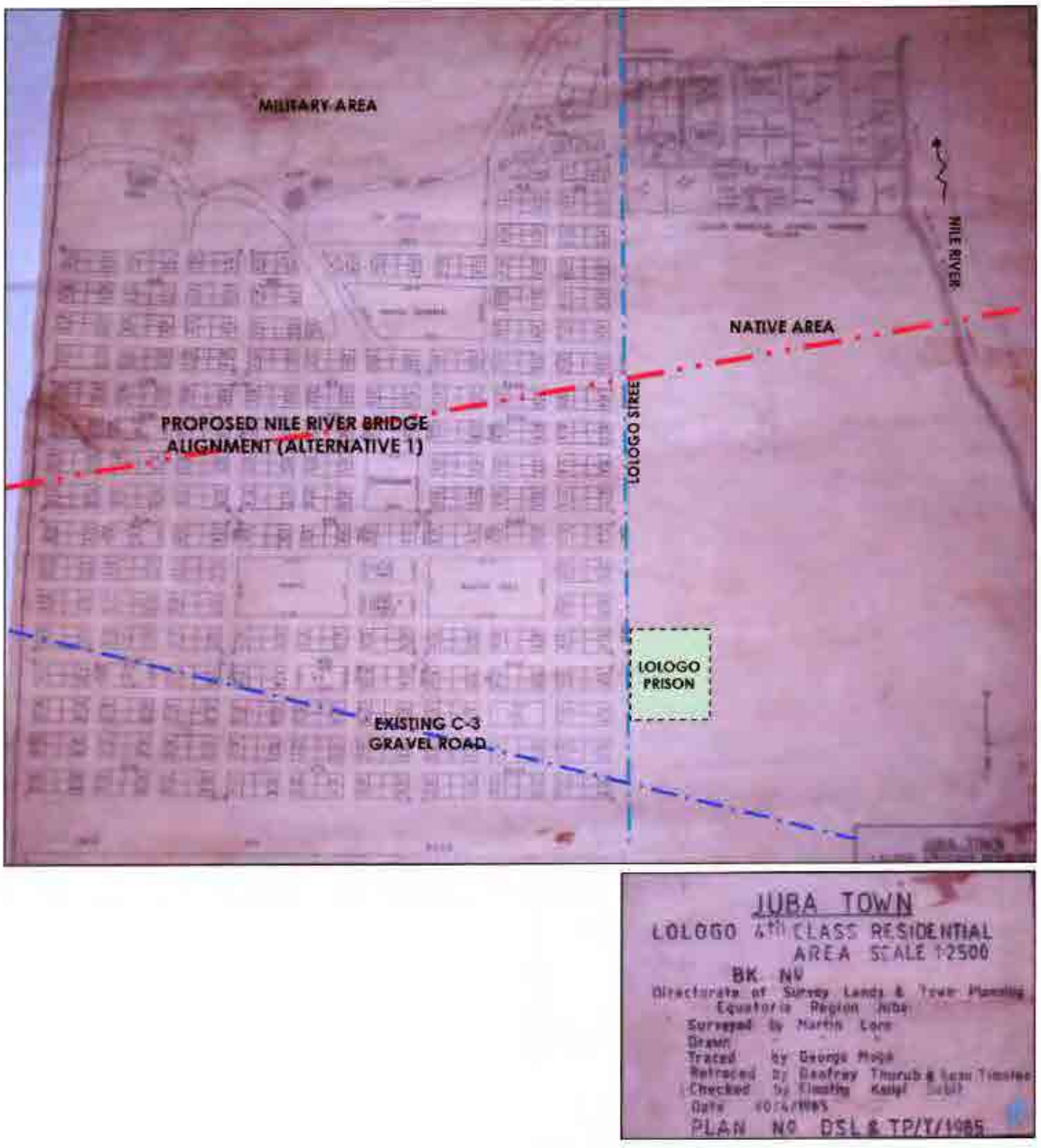
Status of Road Development Projects Related to Nile River Bridge Construction

Annex-3: Appendix 2

Implementation Schedule of Road Development Projects Related to Nile River Bridge Construction



Annex-4



Land Demarcation and Development Plan for Lologo 4th Class Residential Area

Annex-5

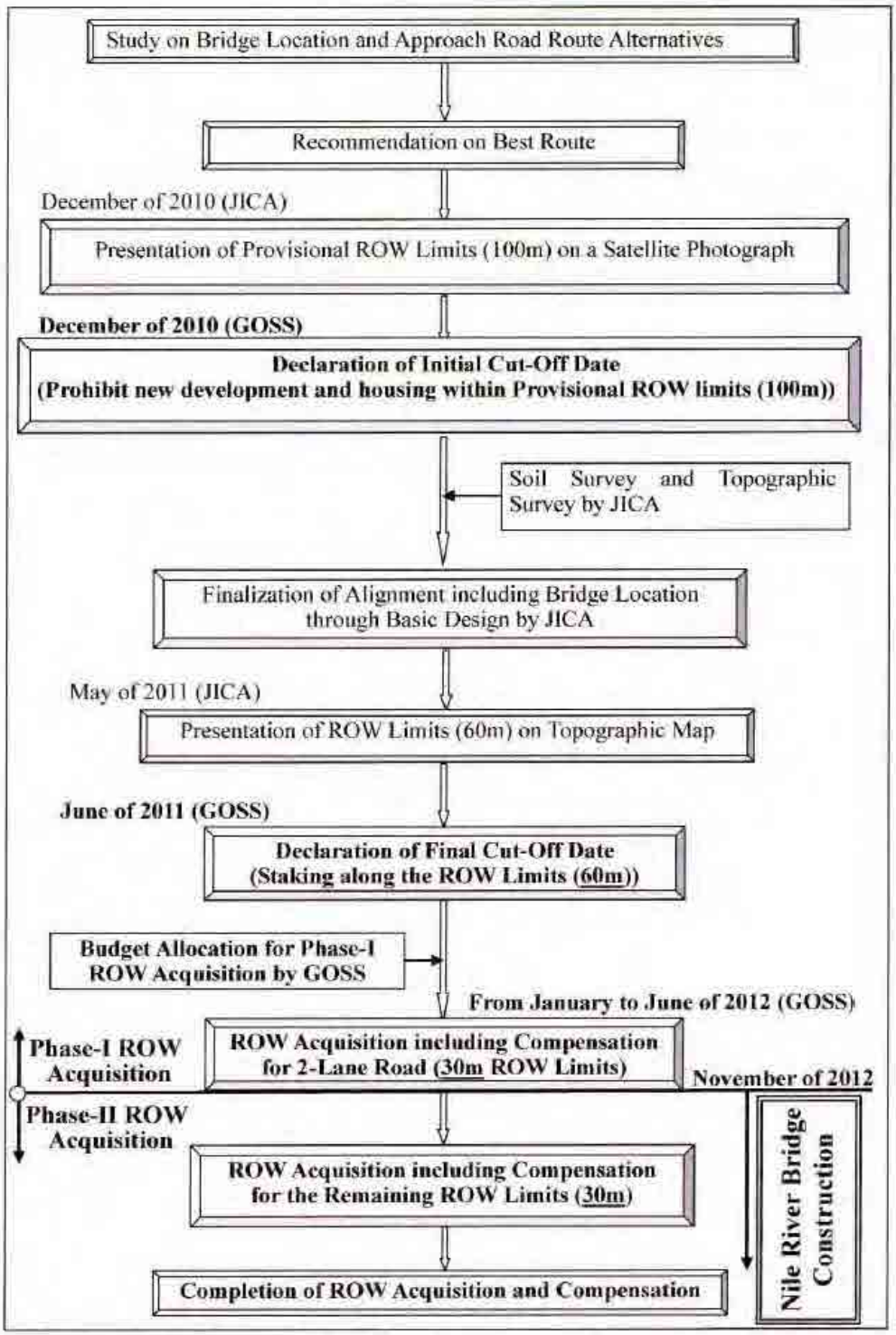
Items and Time Frame on ESC[*1)] to be undertaken by GOSS

	Items to be undertaken by GOSS	Time Frame	Support by Japan Side
1	Establishment of Value Assessment Committee (VAC)	Before JICA Study Team arrival for the 3rd Site Survey (around the middle of February, 2011)	Advice for candidate authorities/agencies and parties for the committee
2	Preparation of Environmental Impact Assessment (EIA) and Resettlement Action Plan (RAP)	• EIA Report preparation other than RAP - From December, 2010 to July, 2011 • RAP Report preparation - From December, 2010 to August, 2011	• Support/Advice for technical issues • Procurement of consultant firm for EIA and RAP preparation • Providing Relevant Basic Design drawings and documents, if required
3	Declaration of Initial Cut-Off Date (prohibiting new development and housing within the Provisional ROW Limits)[*2)]	Within December, 2010	Providing provisional ROW limits (100m) on a satellite map
4	Declaration of Final Cut-Off Date (Staking along the ROW limits)[*2)]	Early June, 2011	Providing ROW limits (60m) on a topographic map
5	Issue of Environmental License (EL) for EIA and RAP by the Ministry of Environment (MOE)	By the end of September, 2011	Providing relevant Basic Design drawings and documents, if required
6	Appraisal by Inter-Ministerial Appraisal Committee (IMAC)	By the middle of October, 2011	Providing drawings and documents necessary for the appraisal
7	Compensation Agreement with Affected Persons	By the end of December, 2011	Providing necessary information
8	ROW Acquisition including Compensation Payment	From early January to the end of June, 2012	
9	Phase-I ROW Acquisition including Relocation of Affected Persons and Clearance of ROW Limits (30m)[*2)]	Before bidding date for the construction	
10	RAP Monitoring	From ROW acquisition until completion of the Project and at appropriate time of after completion of the Project	Advice for the monitoring.
11	EIA Monitoring	Duration of the project implementation and at appropriate time after completion of the Project	

*1) ESC : Environmental and Social Considerations

*2) With respect to the meaning of these items, refer to **Annex-6** of the Technical Notes.

Annex-6



ROW Acquisition by Phasing

資料 5.(2) テクニカルノート

2011 年 3 月 21 日

テクニカルノート 2011 年 3 月 21 日

Technical Notes (The Third Site Survey)

The JICA Survey Team for the Preparatory Survey (the Survey Team) and the representatives of the Ministry of Transport and Roads (MTR) which is the responsible and implementing organization for the Project for Construction of Nile River Bridge in Southern Sudan (the Project) have agreed upon the items described in the attached Technical Notes. Based on these Technical Notes, the Survey Team will carry out the basic design for the Project including the project cost estimate through analysis of the Third Site Survey findings and discussions with concerned authorities in Japan.

The results of the analysis and basic design will be presented and explained in October, 2011.

March 21, 2011
Juba, Southern Sudan

DIRECTOR GENERAL'S OFFICE
DIRECTORATE OF ROADS & BRIDGES
MINISTRY OF TRANSPORT & ROADS
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Technical Notes for the Third Site Survey/Basic Design

1. Application of Design Guideline

Reference shall be made to following manuals and standard specifications for the basic design requirements of roads and bridges:

- Geometric Design Manual, Ministry of Transport and Roads (MTR), GOSS, 2006.
- Bridge Design Manual, Ministry of Transport and Roads (MTR), GOSS, 2006.
- Drainage Design Manual, Ministry of Transport and Roads (MTR), GOSS, 2006

In addition to the above guidelines when other aspects of design are not covered or when a safer and more efficient requirement is indicated, the design of the New Nile Bridge shall refer to other standards, including:

- AASHTO Policy on Geometric Design of Highways and Streets, 2004
- AASHTO LRFD Bridge Design Specifications, 2007
- Specifications for Highway Bridges, Japan Road Association (JRA), 2002
- Specification for River Facilities, Japan River Association (JRA), 1998
- AASHTO Standard Specifications for Highway Bridges, 17th Ed., 2002

2. Right-of-Way (ROW) and Stage Construction

- The proposed New Nile River Bridge falls under the road functional category of International/Interstate Road (Principal Arterial).
- A 60m right-of-way (ROW) is recommended for this road based on the Road Network Master Plan of the Juba Urban Transport Infrastructure and Capacity Development Study (JICA 2010).
- However, considering the initial investment cost for the road and bridge, a stage construction with a 2-lane road and bridge in the initial stage is proposed for this project.
- Moreover, with the present budget constraint within GOSS, it is recommended that the right-of-way acquisition be conducted in two phases with the initial phase covering only 30m wide ROW which is sufficient to accommodate the initial stage 2-lane road.

3. Composition of Bridge and Approach Road Cross Sections

- The cross-section elements for the initial stage 2-lane bridge and road are shown in **Annex-1**.
- ***Bridge Cross-Section***. The recommended bridge cross-section, as shown in **Annex-2**, consists of:

  2 – lanes 3.6m wide traveledway satisfying the requirements of MTR for vehicular travel lanes.

- 2.5m wide sidewalk located on the left side or downstream side considering future 2-lane widening of similar cross-section on the upstream side.
- 2 – 0.75m combined shoulder and gutter.

- ***Approach Road Cross-Section***. The recommended cross-section for the approach road in the initial stage, shown in **Annex-2**, consists of:
  - 2 – lanes 3.6 m wide traveledway satisfying the requirements of MTR for vehicular travel lanes.
  - 2 – 3.0m combined shoulder and sidewalk on both sides of the traveledway

  A 50m long paved section with asphalt or concrete pavement will be provided on each end of the bridge to allow a smooth transition from the standard road section to the bridge section.

  The rest of the road section shall be initially gravel paved with temporary wearing course (base course material) to be utilized as the access road during construction.
  - The MTR (GOSS) shall complete the pavement structure and the drainage facilities of the remaining section of the approach road before completion of the bridge.

4. Bridge Type Alternatives (Annex 3)

- Three (3) alternative types of bridges (as illustrated in **Annex 3**),
  - the Steel Tied Arch (Alternative – 1)
  - the Steel Box-Girder (Alternative – 2) and
  - the Prestressed Concrete Box Girder (Alternative – 3),

  will be compared from the viewpoints of structural system (performance/ durability/maintenance), construction (method/cost/duration/ materials), river hydraulics, and aesthetic & environment.
- The MTR basically agreed with the three candidate alternative options for bridge type. However, selection of the most appropriate type shall be finalized in Japan, after analyzing the data gathered during the third site survey, considering economy, cost-effectiveness and construction reliability.

5. Approach Road Alignment Alternatives (Annex 4)

- Two (2) alternative approach road alignments,
  - the Downstream-side (Alternative-1) and
  - the Upstream-side (Alternative-2)

  options are presented in **Annex 4**.

Both options consider the technical aspect such as geometric and cross-section requirements for the roads, the road length, the social impact, the natural environmental impact and future widening.

- The Downstream-side (Alternative-1) alignment option is recommended considering the least social impact and the initial phase 30m ROW acquisition.

6. Design Requirements

- Road Functional Classification – Interstate Road (Urban/Peri-Urban).
- Design Standard - DS 2 according to the MTR Design Manual. The major geometric design conditions and elements are presented in **Annex 5**.
- Design Speed - 60km/hr as recommended in the JICA Road Network Master Plan in 2010. This proposal satisfies the standard design speed of Urban/Peri-Urban Class DS2.
- Design Flood Frequency and Freeboard – 1.50m freeboard for a 100-yr flood, in accordance with the MTR Design Manual.
- Pavement Design Life – 10 years in consideration of availability of existing reliable data. Pavement design will be made with full composition of pavement layers (including tarmac layers). However, the Scope of Work in the civil work contract under this project will cover layers up to subgrade/gravel base level only, with the pavement structure under GOSS responsibility.
- Utilities on Bridge – the design for bridge structure shall not cover any utilities as future attachment to the bridge.
- Street Lighting – the bridge design will consider provisions for street lighting of the bridge (in terms of locations of light pole base) but will not be part of the scope of works. Street lighting facilities shall be under GOSS responsibility.
- Others – all other design parameters shall follow the recommendations of MTR Manuals and Standards, as mentioned in Item 1. Deviations/exceptions from the standard shall be accompanied with reasonable clarifications.

7. Construction Planning

- Aggregate/Soil Borrow Site. Possible locations of borrow sites are shown in **Annex 6**. When necessary, the MTR shall obtain permissions for mining of aggregate/soil from the community, Ministry of Industry and Mining, CES and/or private firms or individuals concerned.
- Dumping of Discarded Soil. Possible location of disposal area is likewise shown in **Annex 6**. When necessary, the MTR shall obtain permissions for dumping of discarded soil from the community, Ministry of Environment, CES and/or private firms or individuals concerned.
- Construction Yard. The MTR shall procure the construction yard on the east and west areas of the Nile River, to be used during the construction period through negotiation with the community and to execute an agreement of lease prior to the approval of tender documents. Possible locations of construction yards of around 3.5 hectares are shown in **Annex-6**.

- Tax Exemption Related to Construction. The GOSS side shall issue exemption certificates for all concerned members working for the Project from Customs duties, internal taxes and other fiscal levies that may be imposed in Southern Sudan with respect to the supply of products and services, including the exemption certificate from the Central Equatoria State.
- Utility Diversion. The MTR shall relocate overhead electricity lines and electrical poles on the Nimule Road and other areas affected by the project prior to the approval of tender documents.
- River Water Use. Any permit/s necessary (including river water Abstraction Permit, Navigation Permit, etc.) for the use of the river and water during construction of the bridge shall be secured by MTR.

8. Related Projects

- The status and proposed implementation plan of road development projects related to the Nile River Bridge Construction Project in Juba City are presented in **Annex 7**.

9. Environmental License for Environmental Impact Assessment (EIA) and Resettlement Action Plan (RAP)

- EIA. The GOSS side (MTR, MOE, CES, etc.) has agreed on the items and time frame of the Environmental Impact Assessment (EIA) as shown in **Annex 8-1**.
- RAP. The GOSS side (MTR, MOE, CES, etc.) has agreed on the procedures of the Resettlement Action Plan (RAP) as shown in **Annex 8-2.**

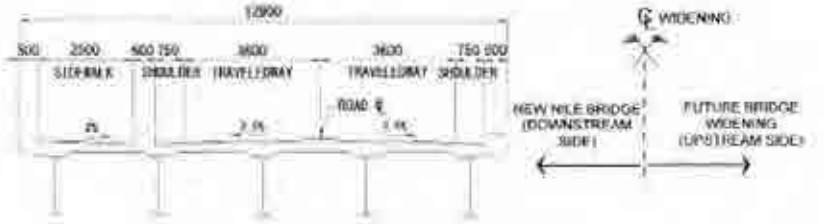
ANNEX 1

Bridge Deck Cross-Section Elements

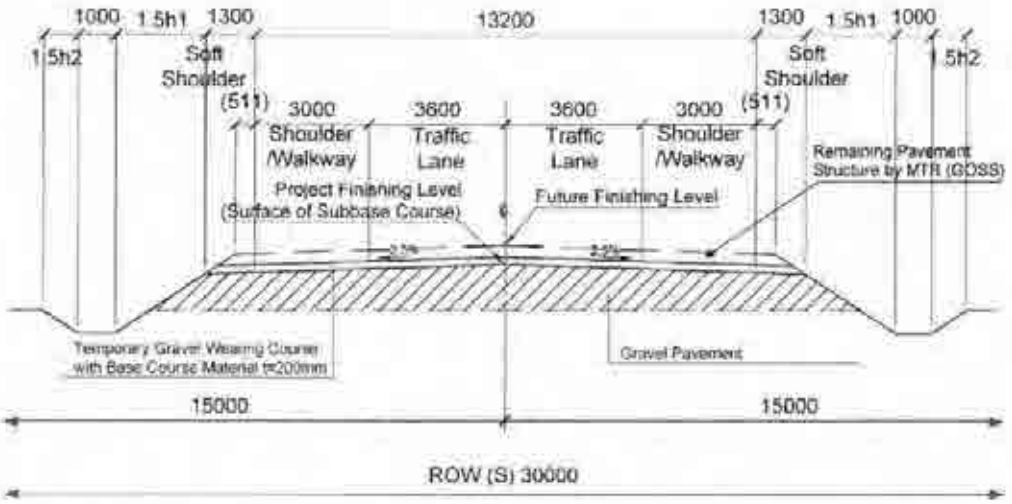
Items	Applied Road Section	Bridge Section		Remarks
		GOSS Standard	Applied to Nile Bridge	
Road Class/Function	Interstate Road [1]/ Primary Arterial [5]			- Connects Juba-Nimule and Juba-Kaya Roads
Design Speed (km/hr)	60	50 (Urban) [1], 60 [5]	60	
Lane Width (m)	3.60	3.65 [1]	3.60	- GOSS minimum for 2-lane road is 7.30m in rural areas
Bridge Width (m)	-	10.30 [2] (min. including shoulder/sidewalk for urban areas)	11.2 (including shoulder/sidewalk)	- Initial stage is a 2-lane bridge under this project - Applied curb-to-curb width is 8.7m plus 2.5m sidewalk
Shoulder (m)	3.5 (combined use)	2x1.5 [2] (combined shoulder/sidewalk)	0.75 (0.5m shoulder + 0.25 gutter)	- GOSS requirement is for combined shoulder and sidewalk
Sidewalk (m)		2.5 (min. on urban roads)	2.5	- GOSS minimum requirement for urban interstate road is 2.5m
Pavement Cross-fall (%)	2.5	2 [2]	2.5	
Freeboard from Design Flood Level (m)	n.a.	1.5 [2]	1.5	- Existing Juba Bridge freeboard from design flood is 0.85m
Min. Span Length for Main Bridge, S (m)	n.a.	-	45 [4]	- $S = 20 + 0.005Q$ [4] $Q = 5{,}000\ m^3/s$ (100 yr discharge)
Design Vehicle	Semi-Trailer (W=2.6, L=16.7, H=4.1)	HS-25/HL-93 [2]	HL-93	

Notes:
[1] Geometric Design Manual, Ministry of Transport and Roads, GOSS, 2006
[2] Bridge Design Manual, Ministry of Transport and Roads, GOSS, 2006
[3] Drainage Design Manual, Ministry of Transport and Roads, GOSS, 2006
[4] Specification for River Facilities, Japan River Association, 1998
[5] Juba Urban Transport Infrastructure and Capacity Development Study in Southern Sudan, Road Network Master Plan, 2010

ANNEX 2



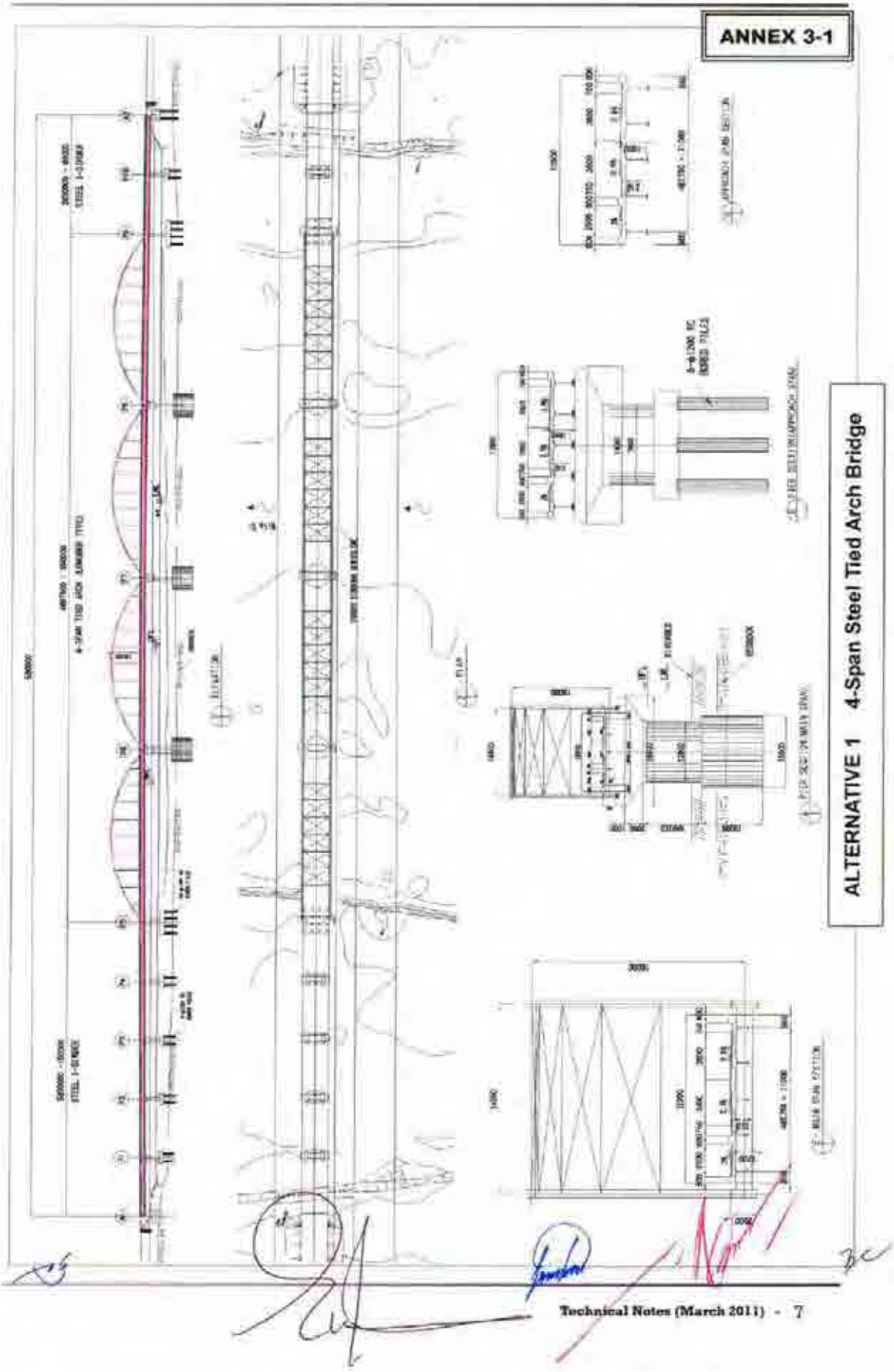
(1) Typical Bridge Deck Section



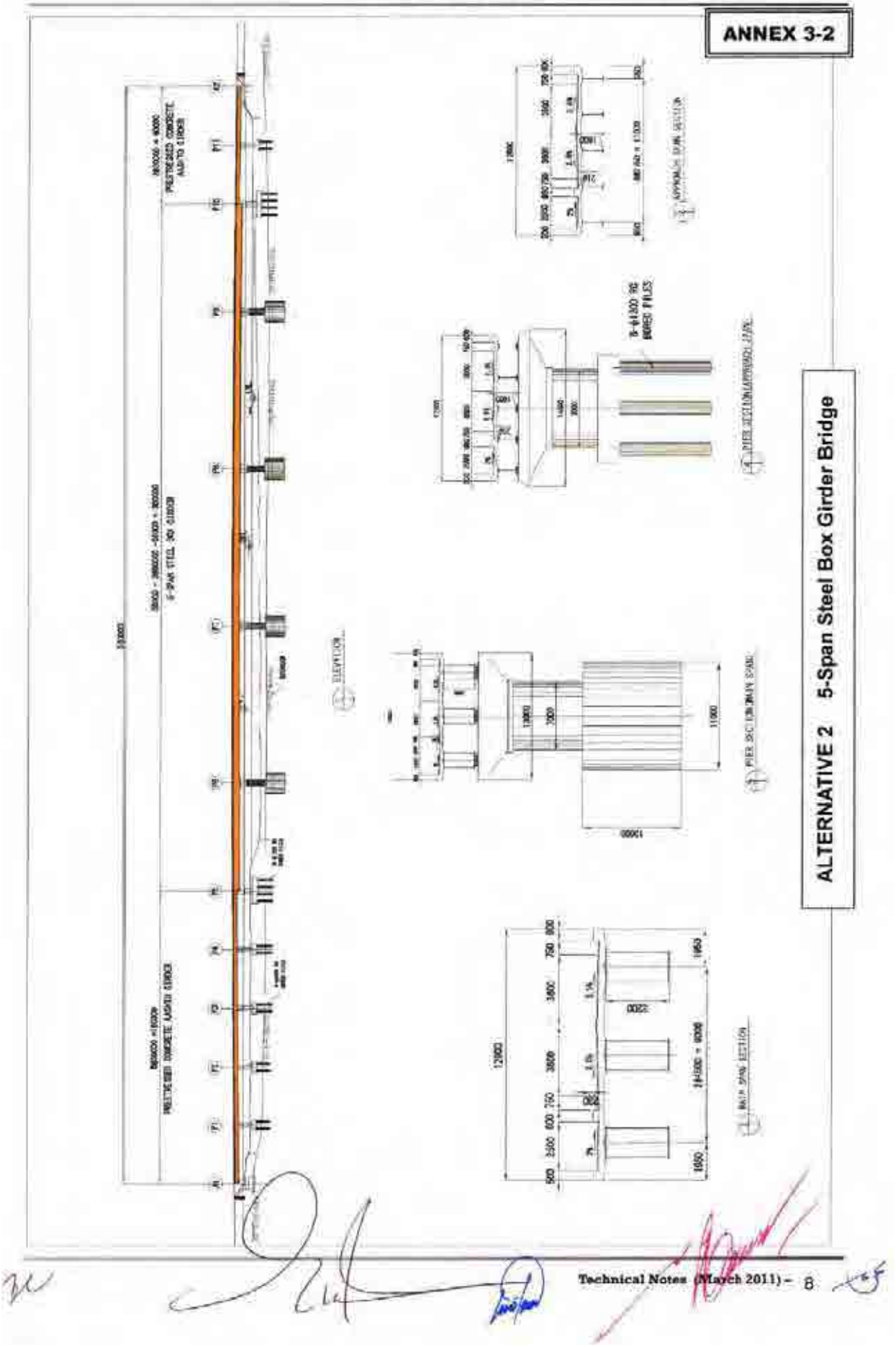
(2) Typical Approach Road Section

(3) 50m Paved Section at Approach Road

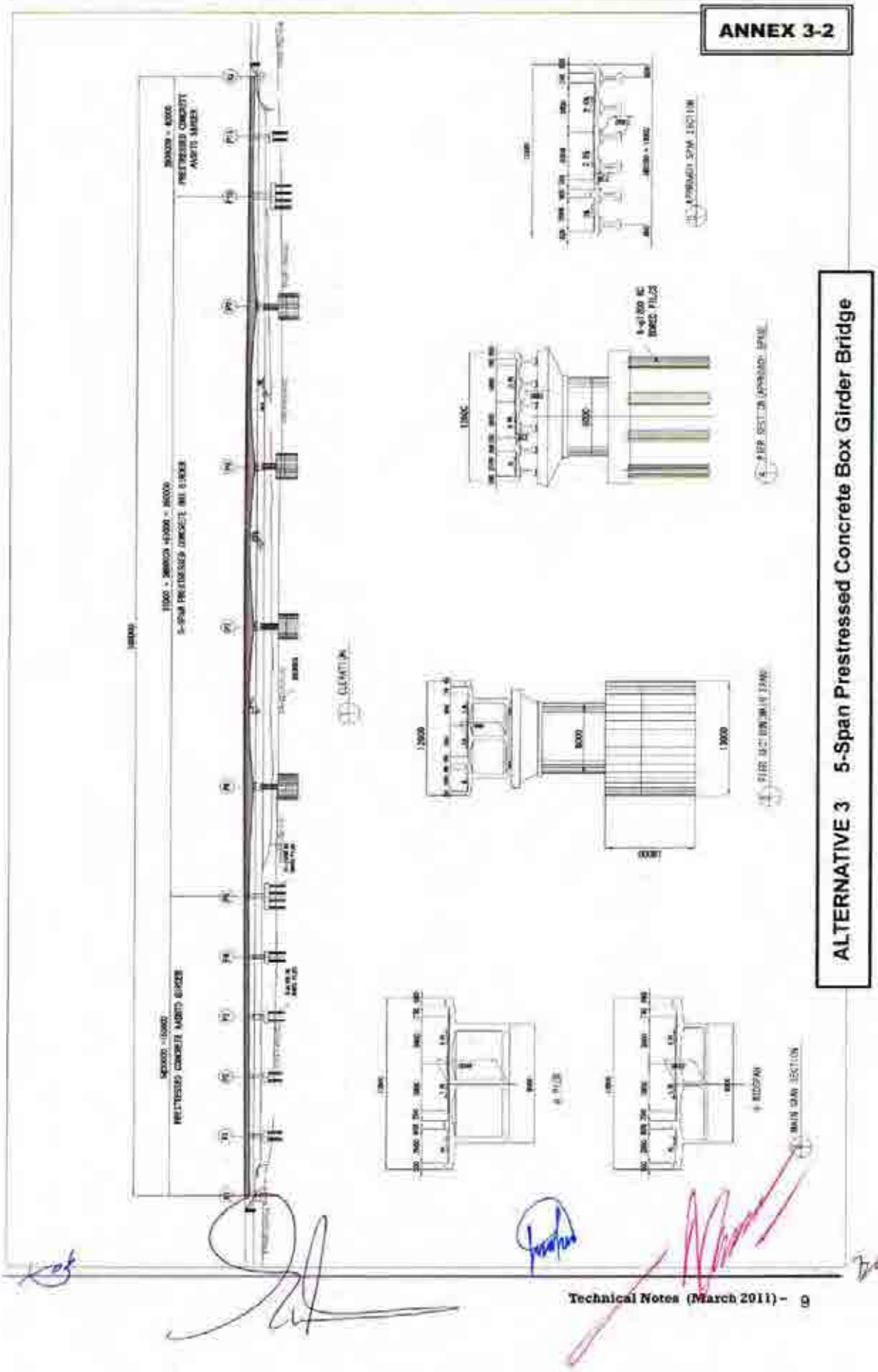
ANNEX 3-1

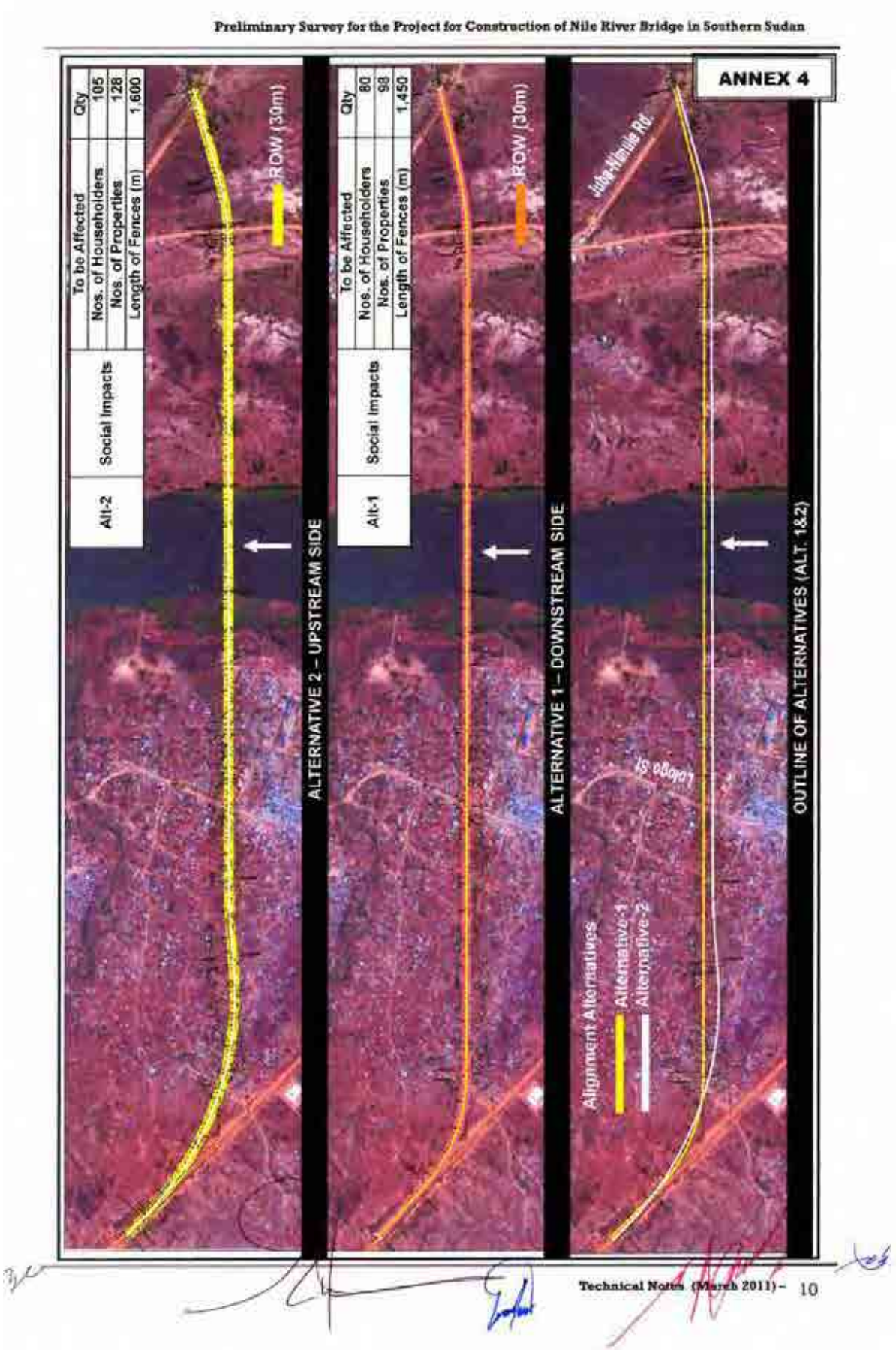


ANNEX 3-2



ANNEX 3-2


ALTERNATIVE 3 5-Span Prestressed Concrete Box Girder Bridge

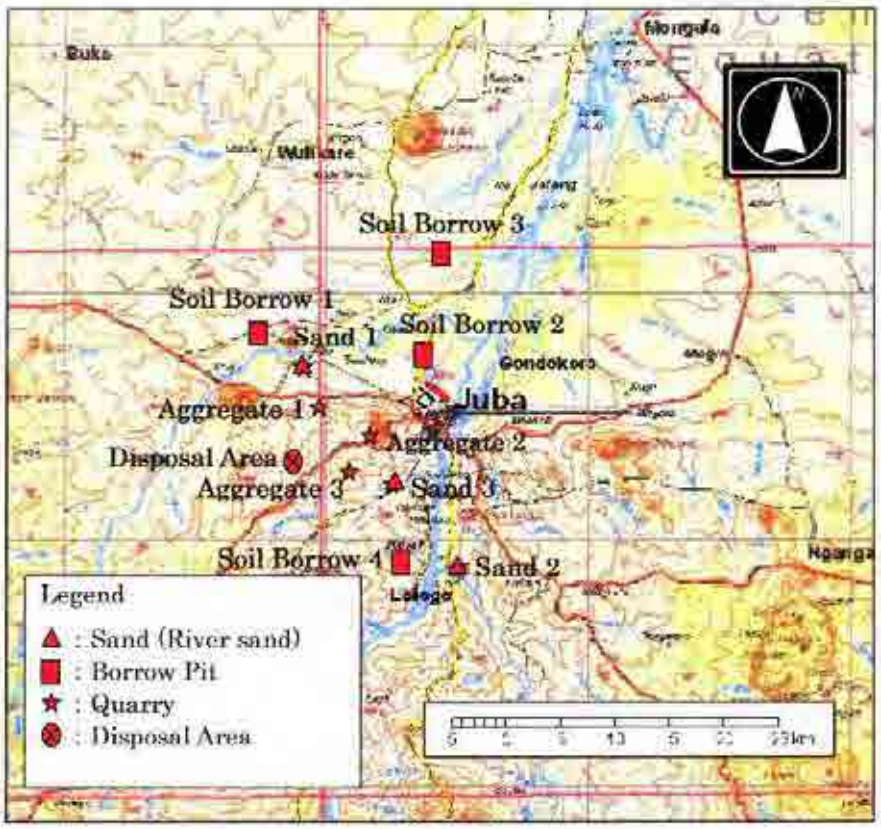

ANNEX 4
Alt-2
Social Impacts
To be Affected
Nos. of Householders 105
Nos. of Properties 128
Length of Fences (m) 1,600
ROW (30m)
ALTERNATIVE 2 – UPSTREAM SIDE
Alt-1
Social Impacts
To be Affected
Nos. of Householders 80
Nos. of Properties 98
Length of Fences (m) 1,450
ROW (30m)
ALTERNATIVE 1 – DOWNSTREAM SIDE
Juba-Nimule Rd.
Juba
Alignment Alternatives
Alternative-1
Alternative-2
OUTLINE OF ALTERNATIVES (ALT. 1&2)

ANNEX 5

Geometric Design Criteria for Roads

Parameters	Unit	Applied	AASHTO	SATCC	Southern Sudan	Remarks
Design Speed	Km/h	60	60	60	60	
Design Vehicle	M	Semi trailer combination large* W=2.6 L=16.7 H=4.1	WB-15 W=2.6 L=17.0, H=4.1	WB-15 (Semi-Trailer) W=2.5, L=17, H=4.1	DV4 Semi trailer combination large* W=2.6 L=16.7 H=4.1	
Lane Width	m	3.6	3.6	3.1~3.7 (3.4)	3.65*1 / 3.5*2 / 3.35*3	Less relationship to the design speed
Shoulder	m	3.0 (Combined Use)	1.2 (Combined Use)	1.5, 2.0,2.5 3.0*4	Town Section 3.5 (Parking) Terrain :Flat 3.0*1 / 2.0*2 / 2.5*3	*1:DS1&DS2 *2: DS3 *3:DS4 *4:Highest Operation Speed and Heavy Traffic
Min .R. of Horizontal Curve	m	150(2.5%)	Crossfall 4% / 6% / 8%: 150 / 135 / 125	Crossfall 6% / 10%: 140 / 125	Crossfall 4% / 8%: 150 / 125	
Min. Curve Length	m	Not Applicable	Not specified	300 (absolute 150)	5* or 300	
Min. R. of Curve for omitting Transition	m	500*5	Not Specified	Not Specified	Transition curve is required to having design speed grater than 80km/hr	*5 R< (Design Speed)²/432: Rounded
Stopping Sight Distance	m	85	85	80	85	
Max. Grade	%	6.0	7.0(Level)	6.0 (Flat)	3.0*6 6.0*7	Flat/Absolute *6:DS1 to DS3 *7:DS4 to DS5
K-Value at Crest Point	-	180	195	-	180	Passing Sight Distance
K-Value at Sag Point	-	Not Applicable	Not Specified	-	180	Passing Sight Distance
K-Value at Crest Point	-	Not Applicable	11	16	18	Stopping Sight Distance
K-Value at Sag Point	-	18	18	16	18	Stopping Sight Distance
Pavement Crosstall	%	2.5	1.5~2*8 2~6*9	2.0-3.0	2.5	*8 :High Surface *9 Low Surface
Height Clearance	M	5.0	4.3	5.1	5.0	
Right of Way	M	60(30)	More than Required Road Width	Not Specified	60	

ANNEX 6



(1) Possible Locations of Borrow Pit, Quarry and Disposal Areas

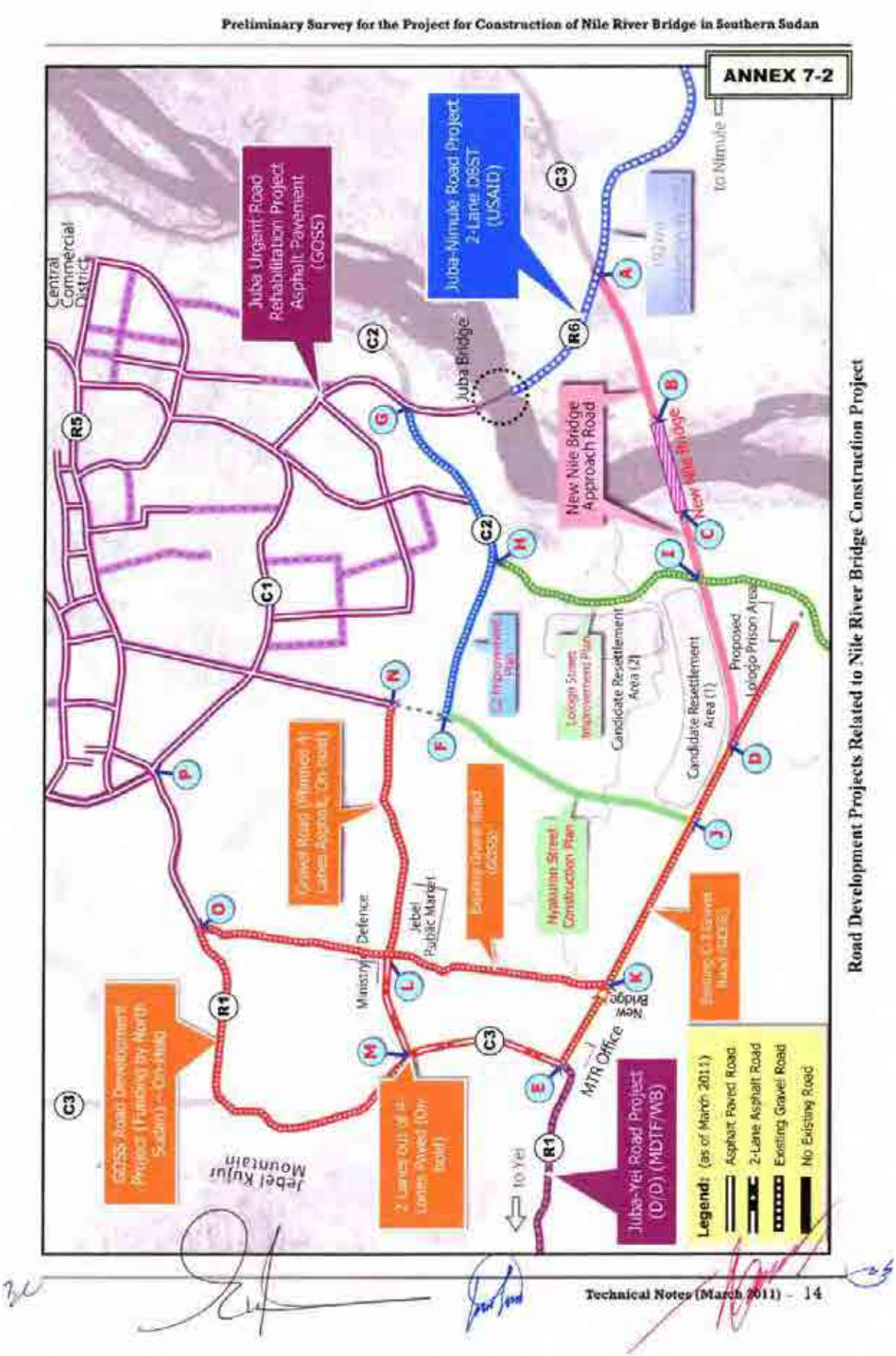
(2) Possible Locations of Construction Yard

ANNEX 7-1

Status of Road Development Projects Related to Nile River Bridge Construction

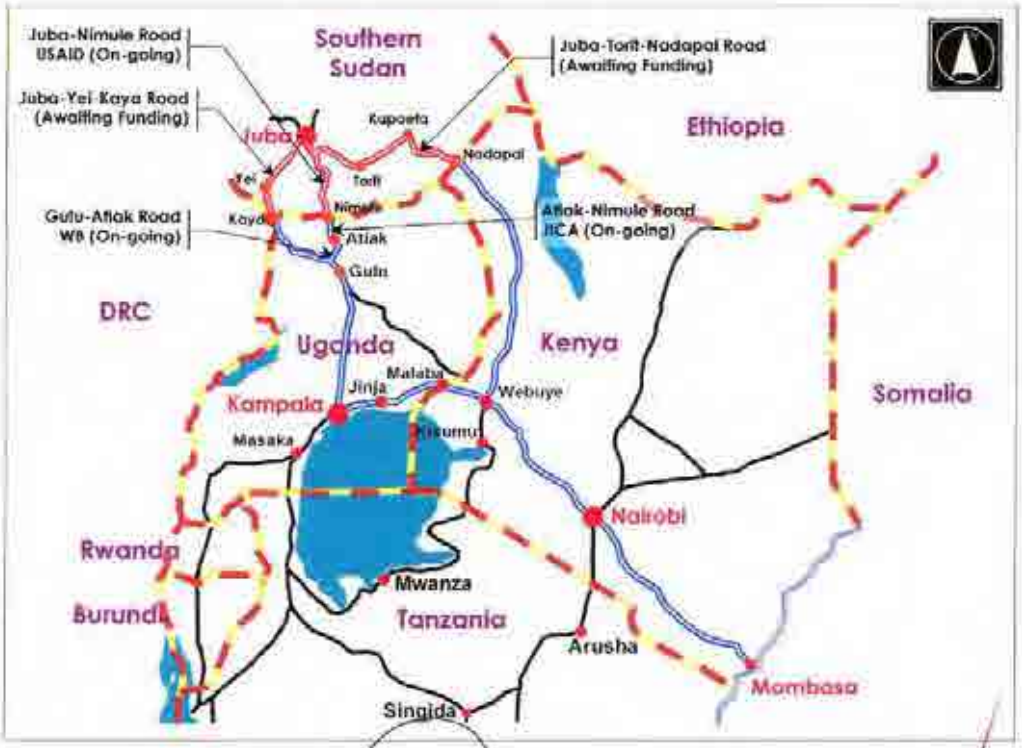
Projects (refer to Annex 7-2, 7-3)	Road Section	Project Description and Status	Expected Funds	Planned Schedule
1. **Nile River Bridge Approach Road**	• A-B and C-D	• Asphalt pavement for 2-lane road utilizing the temporary access roads for Nile River Bridge Construction. • Construction of drainage/side ditches. • Basic design on-going.	GOSS (Temp. access road – Japan)	Refer to Annex 7-4
2. **C-3 Road Improvement**	• D-E	• Gravel road is almost completed. • Remaining works are asphalt pavement, installment of a bridge and drainage/side ditches • Project on-hold	North Sudan*1) (on-hold)	
3. **Lologo Street Improvement**	• H-I	• Widening, grading and resurfacing including alignment improvement • Asphalt pavement • Project planning	GOSS	
4. **C-2 Road Improvement**	• F-G	• Widening, grading and resurfacing including alignment improvement • Asphalt pavement • Project planning	GOSS	
5. **Nyakuron Street Construction**	• F-J	• 2-Lane road construction • Project planning	GOSS	
6. **Collector/Market Street Improvement**	• K-O & M-N	• 4-Lane gravel road is almost completed. • Installation of concrete box culverts • Partial 2-lane asphalt road completed • Asphalt pavement • Project on-hold	North Sudan*1) (on-hold)	
7. **C-3 – R-1 Road Improvement**	• E-M	• 4-Lane gravel road is completed. • 2-lane asphalt pavement completed • Remaining 2-lane asphalt pavement on-hold	North Sudan*1) (on-hold)	
	• M-P	• 4-lane asphalt pavement completed for Section O-P by GOSS • 4-lane asphalt road construction for Section M-O*1) • Project on-hold	GOSS/ North Sudan*1) (on-hold)	
8. **R6 Juba-Nimule Road Project**	• A to Nimule	• 2-lane DBST pavement (192kms) • 8 bridges completed • On-going (Target: Feb. 2012)	USAID	
9. **Juba Urgent Road Improvement Project**	•	• 50kms of asphalt pavement completed (total length = 65kms). • On-going (Project scope increasing)	GOSS	Started in 2006 – no definite target
10. **R-1 Juba-Yei-Kaya Road Project**	• E to Kaya	• 2-lane asphalt pavement (245kms, US$310 million). • D/D on final stage • Awaiting funding for construction	World Bank/ MDTF (D/D)	Not Decided (Seeking funds for construction)
11. **Juba-Torit-Nadapal Road Project**	• Juba to Kenya	• 2-lane asphalt pavement (360kms, US$333 million). • D/D completed • Awaiting funding for construction	World Bank/ MDTF (D/D)	Not Decided (Seeking funds for construction)

Note: *1) Forms part of the 20kms North Sudan Government Road Project.


ANNEX 7-2
Road Development Projects Related to Nile River Bridge Construction Project
Juba Urgent Road Rehabilitation Project Asphalt Pavement (GOSS)
Juba-Nimule Road Project 2-Lane DBST (USAID)
New Nile Bridge Approach Road
New Nile Bridge
Juba Bridge
Central Commercial District
To Nimule
To Yei
Jebel Kujur Mountain
Ministry of Defence
Jebel Public Market
MTR Office
New Bridge
Candidate Resettlement Area (1)
Candidate Resettlement Area (2)
Proposed Lologo Prison Area
Nyakuron Street Construction Plan
Legend: (as of March 2011)
Asphalt Paved Road
2-Lane Asphalt Road
Existing Gravel Road
No Existing Road

ANNEX 7-3

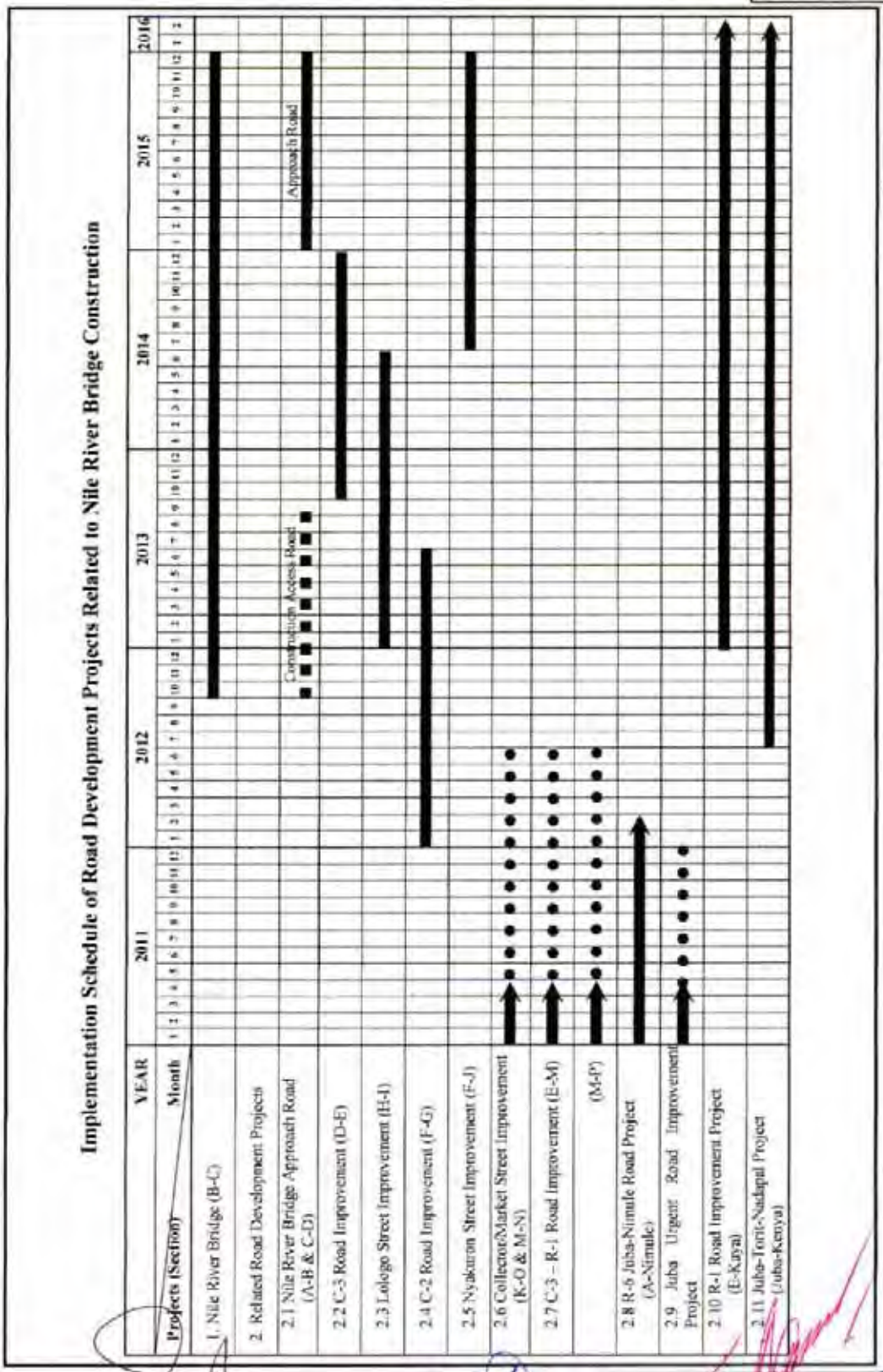
(1) International Road Projects Within South Sudan



(2) Related International Road Projects in Neighboring Countries

ANNEX 7-4

Implementation Schedule of Road Development Projects Related to Nile River Bridge Construction



ANNEX 8-1

Items and Time Frame on the Environmental Impact Assessment (EIA) by GOSS and Japan

	Items to be undertaken by GOSS	Items to be undertaken by Japan	Time Frame
1	Preparation and Review of EIA Report including RAP by MTR	Support of preparation for EIA report	By the end of July, 2011
2	Submission of EIA Report to MOE by MTR	-	By the end of July, 2011
3	Review of EIA Report by MOE	-	By the end of August, 2011
4	Issue of Environmental License by MOE to MTR	-	By the end of September, 2011
5	-	Submission and Explanation of Draft Basic Design (B/D) Report to MTR	By the middle of October, 2011
6	Submission of Environmental License (EL) to Japan Side	Submission of B/D Report to Japanese Government	By the end of October, 2011

⇩

Approval of Japanese Cabinet (EL & B/D Report Essential)

⇩

- Implementation of D/D by Japan side
- Monitoring of EIA (RAP: Compensation, Site Clearance, etc.) by GOSS side

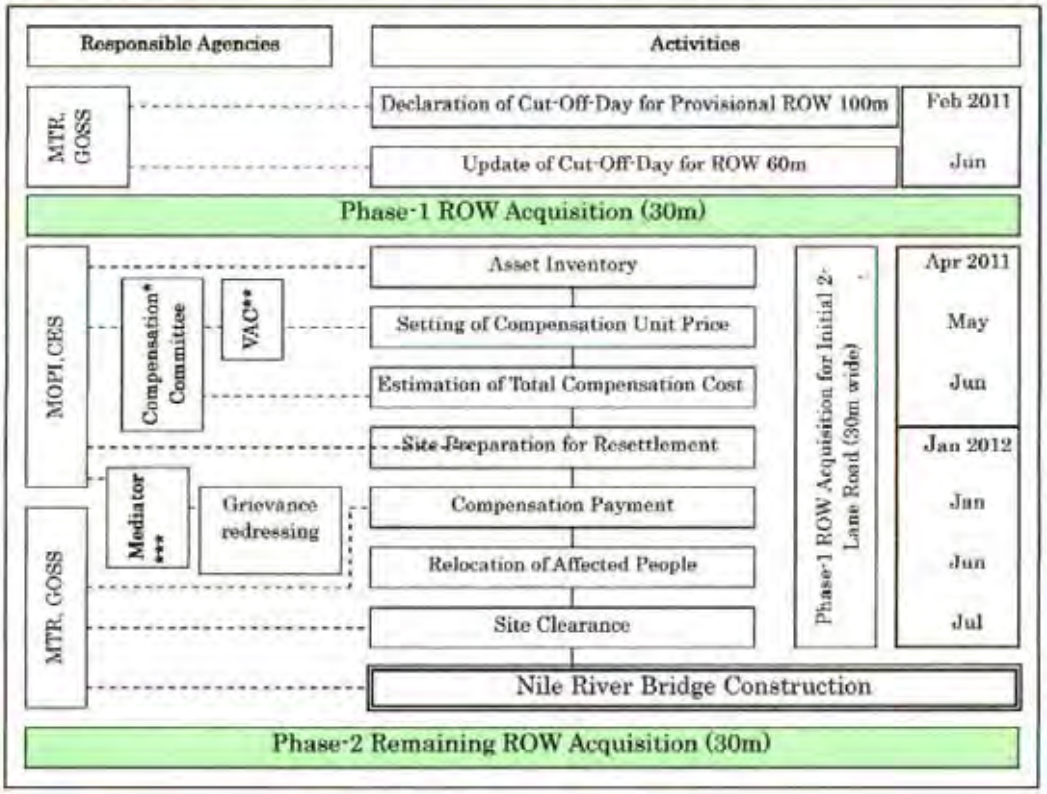
⇩

- Implementation of Bridge Construction by Japanese side
- Monitoring of EIA (Water Quality, Air Quality, Vibration/Noise, etc.) by GOSS side

Note: Details of RAP Procedures are described in Annex 8-2.

ANNEX 8-2

Procedures for the Resettlement of Action Plan (RAP)



Members of Compensation Committee *

Member	Remarks
1st DG, MOPI	Chairman
DIR, Housing and Construction, MOPI, CES	Secretariat
D.D, Urban Roads, Roads & Bridges, MTR, GOSS	Member
Representative of Juba County	Member
Administrator of Payam Rejaf	Member
Chairman of Lologo Committee	Member
Chairman of Gumbo Community	Member

Member of VAC Committee**

VAC Member	Remarks
1st DG, MOPI	Chairman
DIR, Housing and Construction, MOPI, CES	Secretariat
D.D, Urban Roads, Roads & Bridges, MTR, GOSS	Member
DIR, Land and Town Planning, MOPI, CES	Member
DIR, Department of Afforestation, MOAF, CES	Member
DIR, Department of Agriculture, MOAF,CES	Member
Chairman of Lologo Committee	Member
Chairman of Gumbo Community	Member

Members of Mediator***

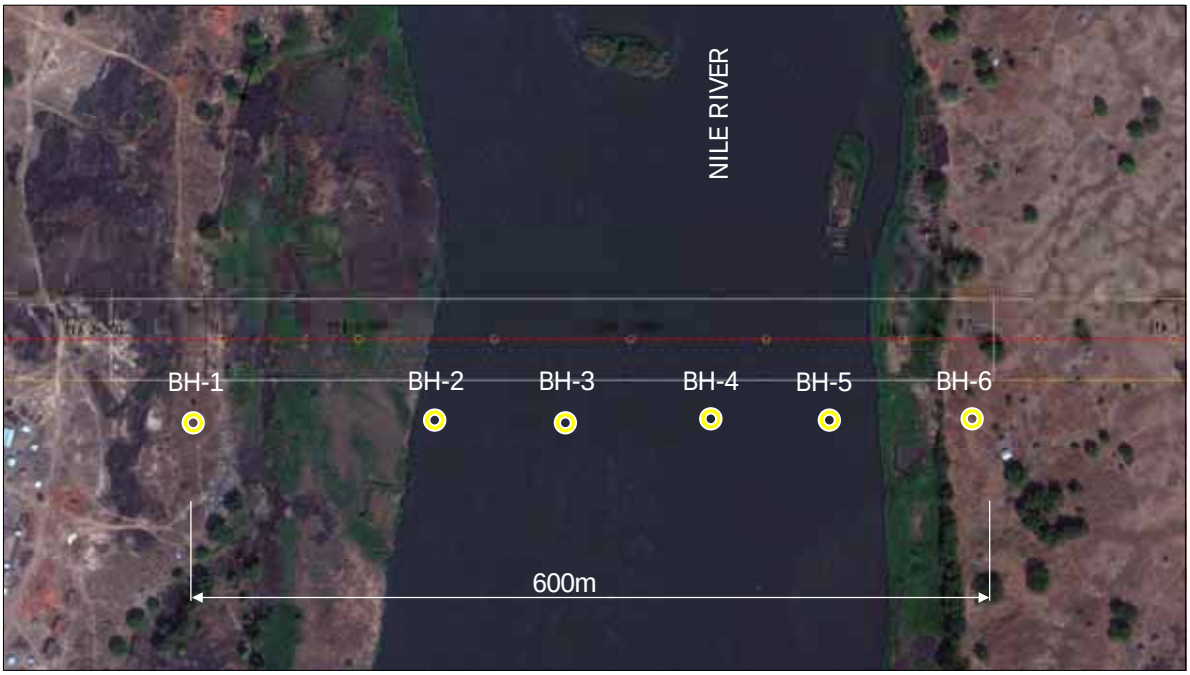
Mediator	Area of Dispute
Payam Land Office	Government/Private Land
Traditional Authority(Community Chief)	Community Land

Legend:
D.D: Deputy Director; DIR: Directorate; DG: Director General; MTR: Ministry of Transport and Roads; MOPI: Ministry of Physical Infrastructure; MOAF: Ministry of Agriculture and Forestry; CES: Central Equatoria State, VAC: Value Assessment Committee.

資料 6. 地質調査結果

地質調査結果

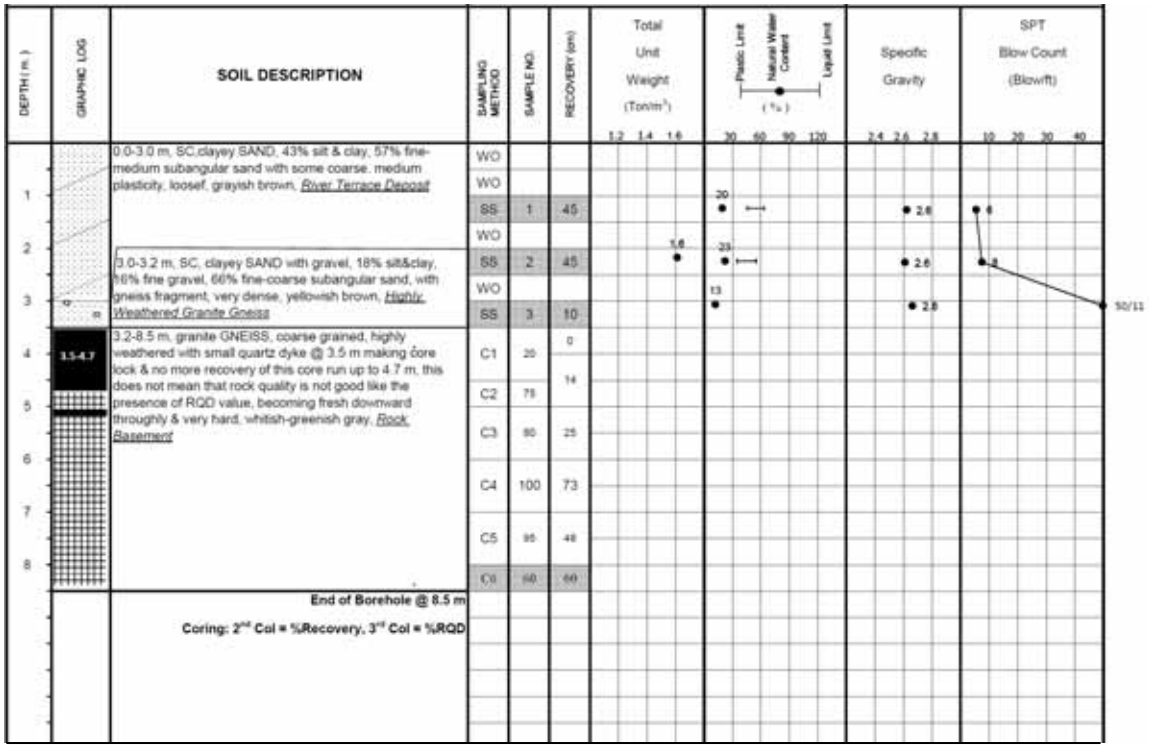
橋梁部の地質状況を把握するため、下図に示す 6 箇所（陸上部 2 箇所、水中部 4 箇所）でボーリング調査が実施された。6 箇所のボーリング柱状図を添付資料に列記する。その他、アプローチ道路での土質状況を明確にするため、11 箇所で CBR 試験が実施された。さらに土や砂、骨材の材料試験が各 3 箇所で実施された。



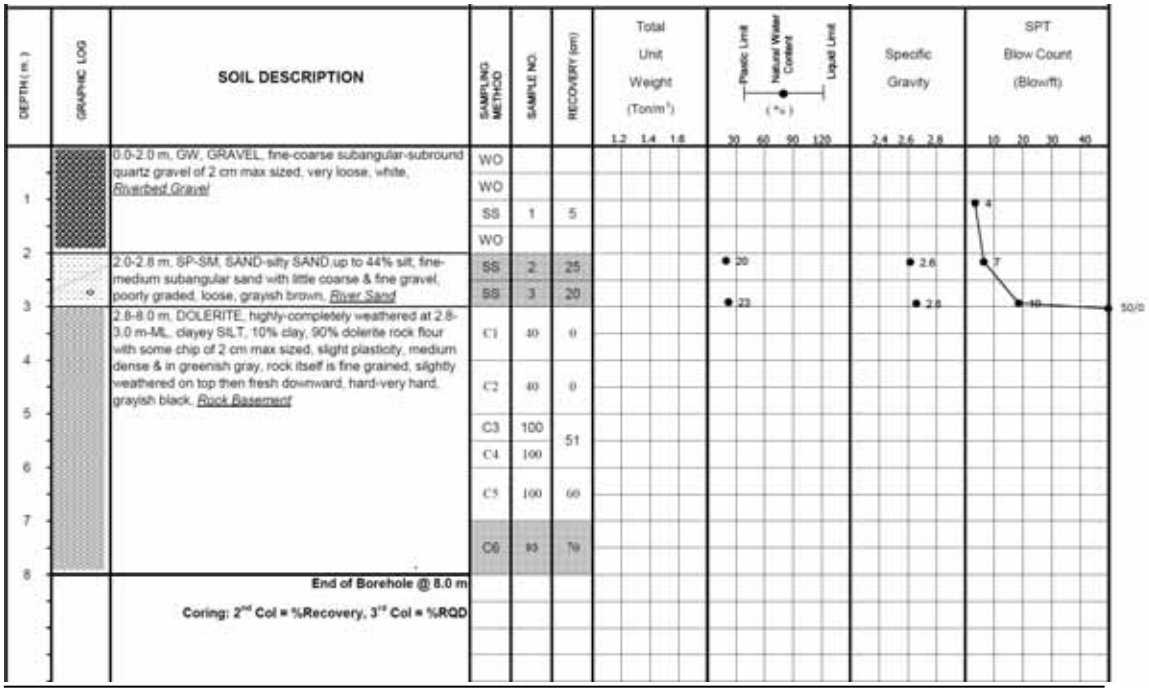
図資 6-1　橋梁設計のためのボーリング位置 (6 箇所)

図資 6-2　アプローチ道路の CBR 試験位置 (11 箇所)

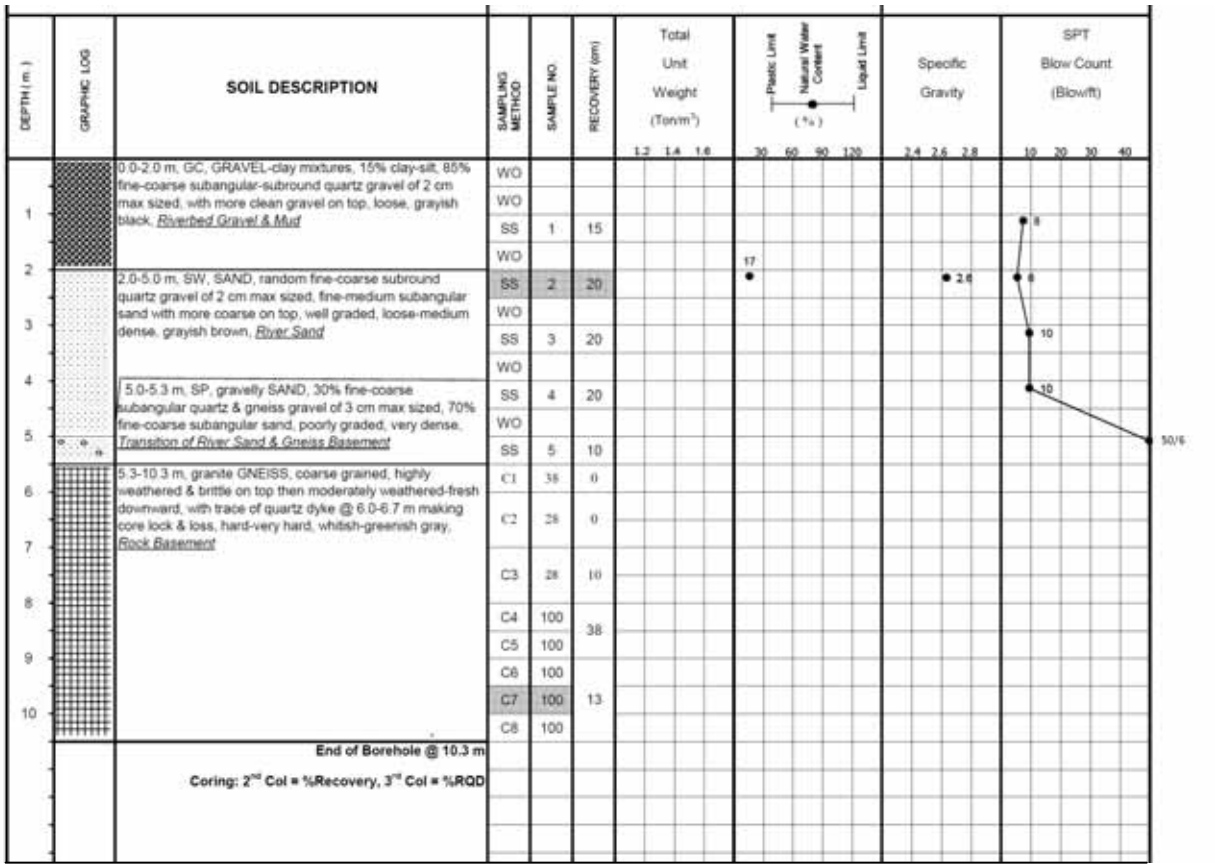
ボーリング柱状図 BH1



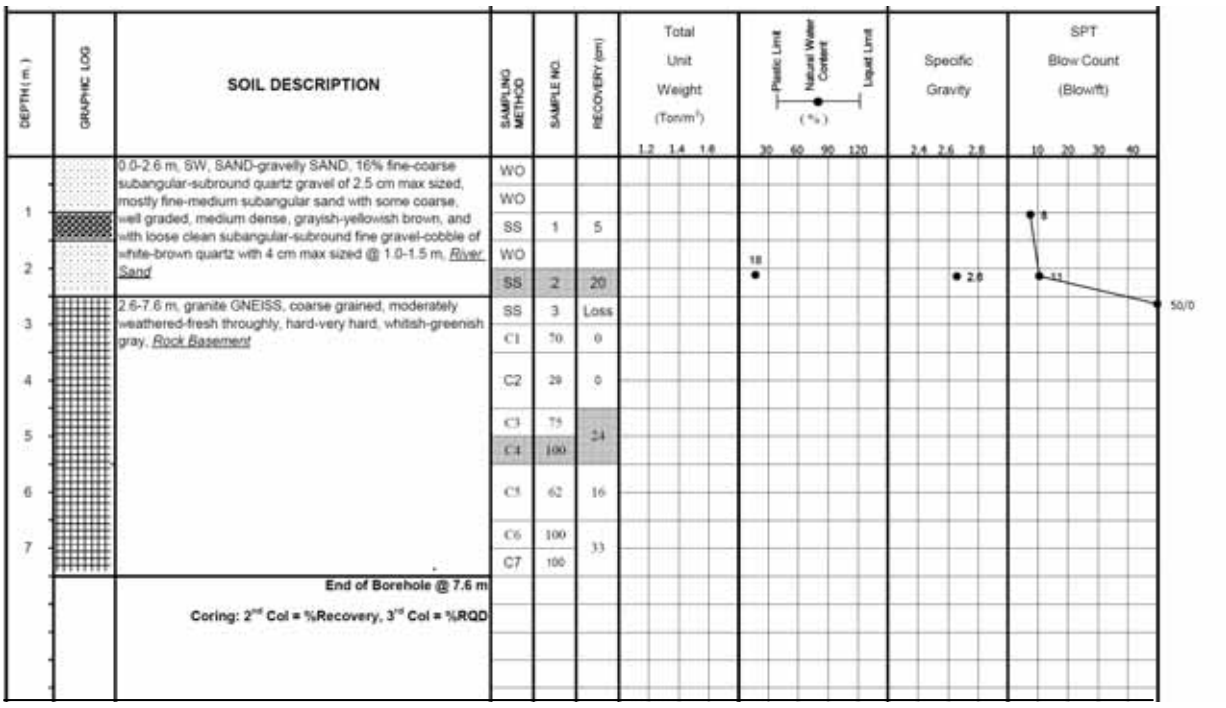
ボーリング柱状図 BH2



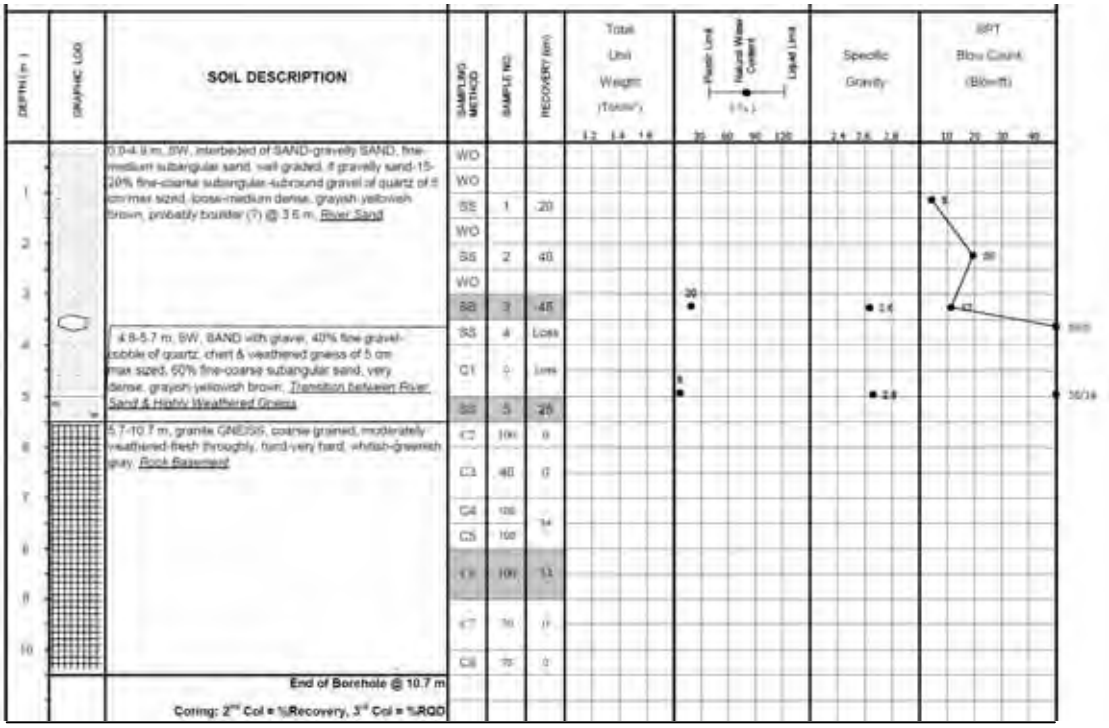
ボーリング柱状図 BH3



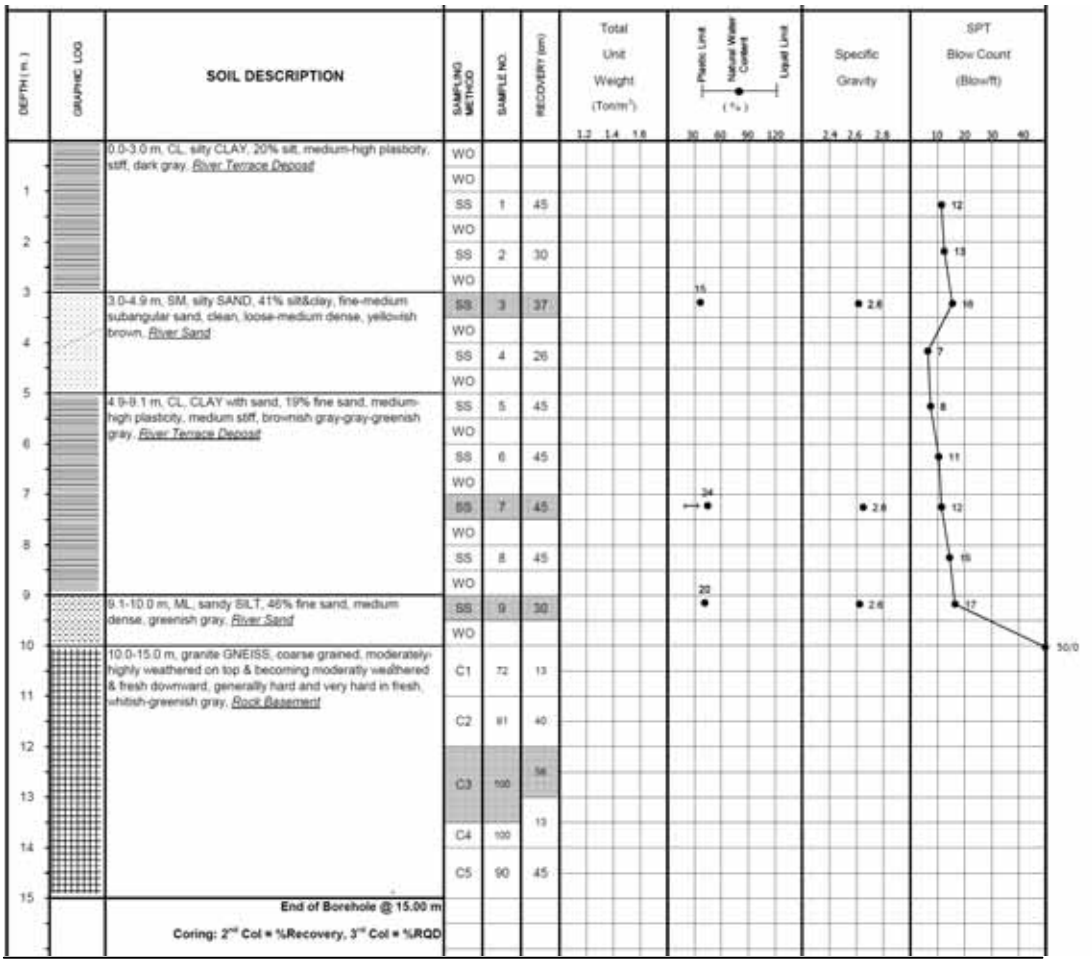
ボーリング柱状図 BH4



ボーリング柱状図 BH5



ボーリング柱状図 BH6



Soundness Test Results

Project : New Nile River Bridge, S-Sudan

Location : Fattouch Crushing Plant Testing Date : 21/03/2011

Tested by : MAA ASSHTO Classification :

Testing Method ☑ Sodium sulphate Solution ☐ Magnesium sulphate Solution

TESTING DATA

Sample No.	Type of Sample	Sieve Size		Grading of Original Sample	Weight of Fractions Before Test	Weight of Fractions After Test	Percentage Passing Designated Sieve After Test	Weighted Percentage Loss
		Passing	Retained	(%)	gm.	gm.	(%)	(%)
AGG1	Coarse Aggregate	2 1/2"	1 1/2"					
		1 1/2"	3/4"	60.1	1509.00	1509.0	0.0	0.0
		3/4"	3/8"	39.9	1000.85	989.0	1.2	0.5
		3/8"	No.4					
		Total		100	2509.85	2498.03		**0.47**

Remarks :