第4章 プロジェクトの評価

4-1 事業実施のための前提条件

事業を実施する上での前提条件は、環境および施工上の点から以下に示す。

4-1-1 環境関係の前提条件

市内橋梁建設に関わる用地買収と住民移転は発生しない。

4-1-2 施工関係の前提条件

- MTRB は入札前に障害物の撤去を完了する。
- MTRB は土取場使用および施工ヤード確保に係る許可を入札前までに完了する。
- MTRB はナイル川の河川水活用がプロジェクトに必要な場合、使用許可を得る。

4-2 プロジェクト全体計画達成のために必要な相手方投入（負担）事項

橋梁整備完了後は、構造物や取付道路の舗装の耐用期間を伸ばすための定期的な維持管理が必要となる。維持管理業務では、日常維持管理として障害物除去および清掃等を実施するとともに、定期点検を確実に行い構造物および舗装等に損傷が見られた場合は早期に適切な補修を行うことが肝要となる。従って、維持管理に必要と試算される年間予算（橋梁/取付道路を含む：17,142 米ドル/年）を確保し、継続的に維持管理を実施することが必要である。なお、前節運営・維持管理費で述べたとおり、南スーダンにおいて維持管理予算確保は可能であると考えられる。

4-3 外部条件

プロジェクトの効果を発現・持続する為には、橋梁及び取付道路の維持管理費の予算確保が外部条件となる。

4-4 プロジェクトの評価

プロジェクトの全体像を踏まえ、本プロジェクトの妥当性および有効性（定量的効果・定性的効果）について以下に示す。

4-4-1 妥当性

本プロジェクトによる妥当性について表 4-4-1 に示す。

表 4-4-1 本プロジェクトを実施する妥当性（市内橋梁（4 橋梁））

項 目	妥当性
開発計画との整合性	・ 独立後の国家計画である「南スーダン開発計画 2011-2013」は、現地政府により 2016 年まで延長し、開発計画の柱としている。この中では「ガバナンス」、「経済開発」、「社会開発及び人間開発」、「紛争予防及び安全保障」の 4 つの柱を掲げている。本プロジェクトによりジュバ市内の安全で効率

項　目	妥当性
	的かつ持続的な道路網を整備することは、南スーダンの開発計画の実施を促進し、ジュバ市および国内外の物流や投資を促すことにより地域の経済成長、更には貧困削減および平和の定着への貢献につながる。これが「経済開発」に該当し、「社会開発及び人間開発」および「紛争予防及び安全保障」に貢献するため、開発計画と整合している。
援助政策･方針の整合性	・　南スーダンに対する我が国の ODA の基本方針は、「1955 年以降 2 度にわたるスーダン内戦を経て、2011 年 7 月に独立を果たした南スーダンの国造りを支援するため、南スーダン開発計画を踏まえ、基礎的な経済・社会インフラ整備、代替産業育成、基礎生活､生計向上、ガバナンスおよび治安能力向上にかかる支援を行うとともに、国内避難民等に対する人道支援を継続することにより同国における平和の定着を支える支援を行う。」と示されている。 ・　本プロジェクトは「基礎的な経済・社会インフラ整備」の方針に整合しており、我が国の橋梁建設技術を用いる必要性、優位性があるとともに我が国の無償資金協力の制度により、プロジェクトの実施が可能である。
技術の難易性	・　南スーダンにはコンクリート橋梁工事の建設できる企業がなく､自国企業による建設は困難である。

4-4-2　有効性

4-4-2-1　　定量的効果

本プロジェクトにより期待される効果を対象橋梁別にまとめ表 4-4-2 に示す。

完成後の供用開始時（2020 年)、供用後の 10 年後（2030 年）にみられる交通量の増加に対応可能な橋梁規模となり、合わせて走行速度改善、通行可能な車両重量の増加でジュバ市内の交通混雑緩和に貢献する。

表 4-4-2　有効性／定量的効果

橋梁番号	現況交通量(pcu/日)*	将来交通量 (pcu/日)**	将来交通量 (pcu/日)***
	現況	供用開始時	供用後 10 年
	2013 年	2020 年	2030 年
No.1	11,677	24,225	38,946
No.4	5,480	9,096	14,623
No.7	6,450	13,296	21,376
No.10	10,454	16,400	26,366
平均走行速度(km/h)	10	50	50
通行可能な車両重量	10 トン以下 (うち 1 橋は 20 トン)	25 トン	25 トン

*2013 年 4 月計測値

**2013 年 4 月計測値を利用し JICA Strada により条件を設定し推計

***2020 年推計値を 2025 年まで 6.5%、2025 年以降は 3.25%の伸び率で引き延ばし推計

4-4-2-2　定性的効果

表 4-4-3　有効性／定性的効果

項　目	有効性／定性的効果
緊急性	・ 橋梁 No.1 は床版が交通荷重により一部崩落し、現地政府により 2011 年に修復した。しかし、施工の品質が悪いため、コンクリートの劣化、鉄筋の露出が早くも確認され同様の崩落が再発する可能性がある。本プロジェクトを実施することにより、こうした危険性を早期に回避することができる。橋梁 No.4,7,10 も老朽化のため、構造的な耐力が大きく低減している。 ・ 全橋は幅員が整備済みの前後道路に対し少なく、歩道もなく、交通のボトルネックとなっている。また、ボトルネックの位置から自動車が転落するなどの事故が発生している。本プロジェクトを実施することにより、こうした事故を早期に回避することができる。
裨益性	・ 橋梁 1,4,7,10 は市内の幹線道路に位置し、市中心部の交通流のボトルネックになっている。ジュバ市の道路は放射道路と市内中心部が先行して整備されているため、交通が分散せずに混雑の要因となっている。ジュバ市内橋梁部の車道幅が 2 車線から 4 車線へと拡幅されることにより交通流が改善され市内混雑の交通緩和に資する。 ・ 橋梁は市内道路網および環状道路網整備を促進し、排気ガス、騒音減少と環境改善にも寄与する。 ・ 2008 年の国勢調査ではジュバ市の人口は 40 万人であり、南スーダン国家統計局による人口増加予想では 2015 年は約 50 万人と想定している。この全人口が裨益することになる。 ・ 貨物は国際回廊と国内主要幹線との結節点に位置するジュバ市を経由し各地に輸送される。ジュバ市内の渋滞緩和は、市内交通の円滑化のみならず広域物流を促進させる上でも大きな役割を果たす。 ・ 橋梁改修により、近隣コミュニティ住民のジュバ市内への往来が促進される。 ・ わが国平和構築無償の整備（6 橋）およびナイル架橋に引き続き、市内橋梁整備を行うものであり、本プロジェクトの実施は両国の信頼関係の醸成に資する。

添 付 資 料

資料 1　調査団員・氏名

資料 2　調査行程

資料 3　関係者（面会者）リスト

資料 4　討議議事録（M/D）

資料 5　収集資料リスト

資料 6　概略設計図

資料 1　調査団員・氏名

1. 調査団員氏名

準備調査現地調査（O/D）

氏　名	担　当	所　属
石黒　実弥	総括	JICA　社会基盤・平和構築部　運輸交通・情報通信グループ　第一チーム 企画役
坂部　英孝 *	総括	JICA　社会基盤・平和構築部　運輸交通・情報通信グループ　第一チーム 主任調査役
溝田　祐造	業務主任/道路計画	（株）建設技研インターナショナル
渡邉　正俊	橋梁設計	同上
平馬　博之	施工・調達計画/積算	同上

*第 3 回現地調査（2016 年 3 月 13 日～同年 3 月 18 日）

資料 2　調査行程

2. 調査行程

2013 年

調査実施表

Date				総括	業務主任／道路計画	副業務主任／橋梁計画／橋梁設計 I	道路設計	橋梁設計 II	水文・水理／排水	環境社会配慮	施工・調達計画／積算	業務調整
No.	Date			石黒 実弥	濱田祐達	中島隆志	渡邊亮平	安岡 泰四郎	森 修一	海口光恵	緒方博允	渡邉正俊
1	3月	15	金		東京(TG677 Dep 17h30)→バンコク(22h30)	東京(TG677 Dep 17h30)→バンコク(22h30)			東京(TG677 Dep 17h30)→バンコク(22h30)	大阪(TG623 Dep 11h00)→バンコク(15h45)		ロロゴバイパス現地踏査
2		16	土		バンコク(KQ877 00h40)→ナイロビ(06h10)、ナイロビ(KQ350,07h45)→ジュバ(09h20)	バンコク(KQ877 00h40)→ナイロビ(06h10)、ナイロビ(KQ350,07h45)→ジュバ(09h20)			バンコク(KQ877 00h40)→ナイロビ(06h10)、ナイロビ(KQ350,07h45)→ジュバ(09h20)	バンコク(KQ877 00h40)→ナイロビ(06h10)、ナイロビ(KQ350,07h45)→ジュバ(09h20)		ジュバ市内橋梁現地踏査
3		17	日		資料整理	資料整理			現地踏査(No18,19、Lologo道路周辺)	予備センサス結果まとめ		ジュバ市内橋梁現地踏査
4		18	月		JICA事務所表敬、MOPI、MRB表敬、地元説明	JICA事務所表敬、MOPI、MRB表敬、地元説明			MOPI 事務所 JICA打ち合わせ	予備センサス結果まとめ		橋梁検討資料作成
5		19	火		実施機関協議	実施機関協議(プロジェクト概要)			流域界の見直し(GIS)、流出量検討	家屋調査、6橋現場確認		橋梁検討資料作成
6		20	水	東京(TG677 Dep17:30)⇒	ロロゴバイパス現地調査	環境省			小規模橋梁の橋長等検討、現地	MOE説明、廃棄物専門家聞取りセンサス結果まとめ		橋梁検討資料作成
7		21	木	⇒ジュバ(KQ350 Arr9:20)	MRB大臣説明	MRB大臣説明			小規模橋梁の橋長等検討	プレゼン資料作成、スコーピング案・TOR案作成		橋梁検討資料作成
8		22	金	MRB・MoPI協議	MRB、MoPI大臣表敬、説明	MRB、MoPI大臣表敬、説明			小規模橋梁の橋長等検討、現地	プレゼン資料作成、スコーピング案・TOR案作成(EN)		橋梁検討資料作成
9		23	土	現地踏査	橋梁現地調査	橋梁現地調査			Lologo流出模式作成、現地	ケニアコンサル打合せ、現地視察(道路・6橋)		橋梁検討資料作成
10		24	日	現地踏査	現地踏査	現地踏査			Lologo流出模式作成 現地	資料整理		地質調査
11		25	月	MM協議	MM協議	MM協議			Lologo施設規模の検討、報告書方針	MOE訪問、スケジュール・業務分担確認		地質調査
12		26	火	MMサイン	MMサイン	MMサイン			Lologo施設規模の検討、報告書作成	MOEとサイト踏査、MRB情報収集(パト)、報告書案		交通量調査
13		27	水	ジュバ(KQ353 Dep15:15)	資料整理	交通量調査			報告書作成	SH会議準備、報告書案作成		交通量調査
14		28	木	⇒東京(TG660 Arr22:30)	第一回ステークホルダー会議	第一回ステークホルダー会議			報告書作成	SH会議(事業説明、ESC説明)		資料作成
15		29	金		ジュバ・イエイ道路調査	ジュバ・イエイ道路調査			ジュバ・イエイ道路調査	TOR案作成(バイパス)		ジュバ(KQ353,15h25)→ナイロビ(17h10)、
16		30	土		ジュバ・イエイ道路調査	ジュバ・イエイ道路調査			ジュバ・イエイ道路調査	TOR案協議(ケニアコンサル)→追加・修正		→バンコク(13h15,KQ886)、バンコク(22h10,TG640)→
17		31	日		ジュバ・イエイ道路調査	ジュバ・イエイ道路調査			ジュバ・イエイ道路調査	資料整理		→成田(06h20)
18		1	月		ジュバ(KQ353,15h25)→ナイロビ(17h10)、ナイロビ(KQ886,13h15)→	資料整理、現地調査			ジュバ(KQ353,15h25)→ナイロビ(17h10)、ナイロビ(KQ886,13h15)→	TOR案協議と修正・今後作業打合せ		
19		2	火		→バンコク(13h15,KQ886)、バンコク(22h10,TG640)→	道路設計条件の検討			→バンコク(13h15,KQ886)、バンコク(22h10,TG640)→	SH会議準備(連絡)、MOPI打合せ、MOPI用資料作成		
20		3	水		→成田(06h20)	道路設計条件の検討			→成田(06h20)	TM用資料作成、MOE聞きとり(フロー、組織図等)		
21	4月	4	木			実施機関協議(ロロゴバイパス)	東京(JL5095 Dep 22:00)⇒			TM/MOPIへ説明と確認)		
22		5	金			第二回ステークホルダー会議	⇒ナイロビ(EK719 Arr 14:45)			SH会議(TOR案、Cut off Date説明)、議事メモ作成		
23		6	土			道路線形の検討	⇒ジュバ(KQ352 Arr 14:35)			バイパス現場の施設確認、ヒアリング		
24		7	日			交差点の検討	現地調査			資料整理		
25		8	月			JICA事務所途中報告	JICA 事務所表敬 調達調査			報告書案作成		
26		9	火			実施機関協議(橋梁)	実施機関協議			報告書案作成、TOR確認、樹・樹木確認、Payam説明		
27		10	水			現地調査	ロロゴバイパス現地調査 実施機関協議			見積もり比較表、機種確認、報告書案作成		
28		11	木			ジュバ(KQ353,15h25)→ナイロビ(17h10)、ナイロビ(KQ886,13h15)→	JICA事務所報告 道路線形検討			ジュバ(KQ353,15h25)→ナイロビ(17h10)、ナイロビ(KQ886,13h15)→		
29		12	金			→バンコク(13h15,KQ886)、バンコク(22h10,TG640)→	資料整理(ホテル待機)			→バンコク(13h15,KQ886)、バンコク(23h30,TG622)→		
30		13	土			→成田(06h20)	工事単価検討			→成田(07h00)		
31		14	日				工事単価検討					
32		15	月				橋梁建設費の検討					
33		16	火				調達調査 橋梁建設費検討					
34		17	水				調達調査					
35		18	木				橋梁建設費検討					
36		19	金				見積徴収先と砕石業者視察					
37		20	土				PKO実施区間見学、現場調査					
38		21	日				資料整理					
39		22	月				ロロゴバイパス現地調査					
40		23	火				既存道路、橋梁現場調査					
41		24	水				ロロゴバイパス道路設計条件の整理と橋梁資料作成					
42		25	木				ロロゴバイパス道路設計条件の整理と橋梁資料作成					
43		26	金				ロロゴバイパス道路設計条件の整理と橋梁資料作成					
44		27	土				ロロゴバイパス道路設計条件の整理と橋梁資料作成					
45		28	日				協議資料作成					
46		29	月				協議資料作成					
47		30	火				実施機関協議 帰国報告					
48		1	水				協議資料作成	大阪(JL5099,23h40)→				
49		2	木				ジュバ⇒ナイロビ(KQ351 Arr 12:00)⇒ドバイ(EK720 Arr 22:40)	ドバイ(05h10)ドバイ(EK719,10h45)→ナイロビ(14h45)				
50		3	金				ドバイ⇒成田(JL5096 Arr 17:35)	ナイロビ(KQ352,12h50)→ジュバ(14h35)				
51		4	土					現地調査				
52		5	日					資料整理				
53		6	月					現地調査				
54		7	火					橋梁取り付け道路検討				
55		8	水					橋梁取り付け道路検討				

2013 年

調査実施表

Date			総括	業務主任／道路計画	副業務主任／橋梁計画／橋梁設計 I	道路設計	橋梁設計 II	水文・水理／排水	環境社会配慮	施工・調達計画／積算	業務調整
No.	Date		石黒 実弥	溝田拓造	中島隆志	渡邊亮平	安田 幸四郎	森 修一	海口光恵	緒方博允	渡邉正俊
56	5月	9 木					橋梁取り付け道路検討				
57		10 金					実施機関協議				
58		11 土					現地調査				
59		12 日					資料整理				
60		13 月					橋梁検討				
61		14 火					橋梁検討				
62		15 水					橋梁検討				
63		16 木					橋梁検討				
64		17 金					実施機関協議				
65		18 土					現地調査				
66		19 日					協議資料作成				
67		20 月					協議資料作成				
68		21 火					協議資料作成				
69		22 水					協議資料作成				
70		23 木					協議資料作成				
71		24 金					実施機関協議				
72		25 土					協議資料作成				
73		26 日					協議資料作成				
74		27 月					実施機関協議 帰国報告				
75		28 火					協議資料作成				
78		29 水					ジュバ(KQ351 10h15)→ナイロビ(12h00、ナイロビ(EK720 16h40)→ドバイ(22h40)				
77		30 木					ドバイ(JL5090 03h00)→大阪(17h10)				
78		31 金									
79	6月	1 土								東京(EK319 Dep 22:00)⇒	
80		2 日								⇒ナイロビ(EK719 Arr 14:45)	
81		3 月								⇒ジュバ(KQ352 Arr 14:35)	
82		4 火								現地調査(橋梁サイト・土取り場)	
83		5 水								現地調査(砕石、プラント、土取り場)	
84		6 木								ジュバ・イエイ道路調査	
85		7 金								ジュバ・イエイ道路調査	
86		8 土								ジュバ・イエイ道路調査	
87		9 日								資料まとめ	
88		10 月								現地調査(橋梁)	
89		11 火			現地参加、実施機関協議				関空(JL5099 23:40)→ドバイ	現地調査(砕石、プラント、土取り場)	
90		12 水			埋設物調査				ドバイ(EK719 10:45)→ナイロビ(打合せ)	現地調査(橋梁、廃棄物・工指場、土取り場)	
91		13 木			交通量調査結果の整理、確認				ナイロビ(KQ352 12:50)→ジュバ	見積もり収集・現地調査ロロゴバイパス	
92		14 金			橋梁基本計画				EIAチェック、コメント送付	現地調査(仮設用地、ロロゴバイパス)	
93		15 土			橋梁基本計画				RAP, ESIA受取、ESIAチェック	現地調査(橋梁、迂回路)	
94		16 日			資料整理				Asset結果チェック	資料まとめ	
95		17 月			実施機関との打合せ				PAP数来す、データ送付依頼、調査開始段取り	仮設ヤード現地立会(MOPI)、現地調査	
96		18 火			実施機関協議(全体)				RAP, ESIA受取、RAPチェック→コメント	現地調査(ロロゴバイパス)	
97		19 水			埋設物調査				Census＋GPS、マッチング作業	埋設物立会(水道公社	
98		20 木			環境社会配慮調査打合せ				Census＋GPS、マッチング→AHs, PAPs計算	現地調査(ロロゴバイパス)	
99		21 金			排水設計、概略図面作成				Cost Survey受取、WS資料、追加Census開始	施工計画検討、現地調査	
100		22 土			排水設計、概略図面作成				データー修正(RAP)、レポート修正(EIA/ESIA)	現地調査(骨材プラント)	
101		23 日			資料整理				追加Census作業-打合せ、サマリー作成	資料まとめ	
102		24 月			相手国負担事項に関する協議				追加Census作業(データ整理)	施工計画検討、現地調査	
103		25 火			ロロゴバイパス住民説明会				Assetデータ修正、(バイパスWS)	現地調査(概要、ロロゴバイパス、砂、骨材)	
104		26 水			Technical Notesの準備				SH会議準備(資料確認)、EIA/ESIAのOFR確認作業	施工計画検討、現地調査	
105		27 木			第三回ステークホルダー会議、JICA事務所報告、Technical Notesの署名、運賃事務所報告				SH会議出席、RAP進捗確認	JICA報告、施工計画検討、現地調査	
106		28 金							RAP修正箇所確認、バイパス現状確認	施工計画検討、現地調査(ロロゴバイパス)	
107		29 土			ジュバ⇒ナイロビ(KQ351 Arr 12:00)⇒ドバイ(EK720 Arr 22:40)				ジュバ(KQ351 10:15)→ナイロビ(EK720 16:40)→ドバイ	ジュバ⇒ナイロビ(KQ351 Arr 12:00)⇒ドバイ(EK720 Arr 22:40)	
108		30 日			ドバイ⇒成田(EK318 Arr 17:35)				ドバイ(JL 5090 3:00)→関空	ドバイ⇒成田(EK318 Arr 17:35)	

Juba
Trip

JICA: Japan International Cooperation Agency
MRB: Ministry of Roads and Bridges under RSS (Republic of South Sudan)
MOPI: Ministry of Physical Infrastructure under CES (Central Equatoria State)
JICAスーダン事務所および大使館報告は必要に応じて行う。

資 2-2

2015 年

			業務主任/道路計画	施工・調達計画/積算
			Chief Engineer/Road Planner	Construction & Procurement Planer/ Cost Estimator Project Coordinator
			溝田 祐造	平馬　博之
			Mr. MIZOTA Yuzo	Mr. HEIMA Hiroyuki
1	9/16	Wed		Departure from Haneda Arrival at Nairobi
2	9/17	Thu		Departure from Nairobi Arrival at Juba Meeting with JICA
3	9/18	Fri		Meeting with supporting members and check of schedule and preparation
4	9/19	Sat		Road/bridge condition survey of six bridges
5	9/20	Sun		Internal work for preparation of survey drawing for Obstruction location
6	9/21	Mon		Topographic survey for six bridges to check Obstructions(No.1&No.4
7	9/22	Tue		Topographic survey for six bridges to check Obstructions(No.7&No.10
8	9/23	Wed	Departure from Narita	Topographic survey for six bridges to check Obstructions(No.18&No.19
9	9/24	Thu	Arrival at Nairobi Departure from Nairobi	Internal work for preparation of drawing of Obstruction location as result
10	9/25	Fri	Departure from Nairobi Arrival at Juba Road/bridge condition survey of six bridges	Road/bridge condition survey of six bridges Internal Meeting for Result of Obstruction Situation
11	9/26	Sat	Road/bridge condition survey of six bridges	Preparation of Report for Obstructions Rain water discharge condition check in each bridge
12	9/27	Sun	Internal meeting on grant aid project	Preparation of Report for Obstructions
13	9/28	Mon	Meeting with MOPI and Site visit Meeting with JICA South Sudan Office	Meeting with MOPI and Site visit Meeting with JICA South Sudan Office
14	9/29	Tue	Meeting with Juba Mayor Road/bridge condition survey of six bridges	Preparation for BM and Reference points in No.1&4 bridges Road/bridge condition survey of six bridges
15	9/30	Wed	Road/bridge condition survey of six bridges	Preparation for BM and Reference points in No.7&10 bridges
16	10/1	Thu	Meeting with EOJ Meeting with MTRB	Meeting with EOJ Meeting with MTRB Preparation for BM and Reference points in No.18&19 bridges
17	10/2	Fri	Meeting with EOJ Meeting with JICA Departure from Juba	Meeting with EOJ Meeting with JICA Explanation of Obstruction Area to MOPI in the site
18	10/3	Sat		Road/Bridge condition survey of six bridges Confirmation of all obstruction areas that Surveyor marked before
19	10/4	Sun		Internal work for preparation of Survey Report
20	10/5	Mon		Meeting with MTRB Explanation of Obstruction Area to MOPI in the site Departure from Juba
21	10/6	Tue		Arrival at Haneda

2015 年

			業務主任/道路計画	施工・調達計画/積算
			Chief Engineer/Road Planner	Construction & Procurement Planer/ Cost Estimator Project Coordinator
			溝田 祐造	平馬　博之
			Mr. MIZOTA Yuzo	Mr. HEIMA Hiroyuki
1	10/13	Tue		Departure from Haneda Arrival at Nairobi
2	10/14	Wed		Stay at Nairobi
3	10/15	Thu		Departure from Nairobi Arrival at Juba
4	10/16	Fri		Meeting with Mr.Otim/Director of MTRM to inform the purpose of our study.　Meeting with Local contractor to request the cost estimations and hearing someinformation.
5	10/17	Sat		Site Survey for the Construction Area of Bridge No.7 and found its much difference from the drawing of itas location in actual and ask to the head quarter of Japan about drawing data.
6	10/18	Sun		Internal work for preparation of cost estimation company to have meetings with them.
7	10/19	Mon		Site investigation for the rock line to check the possibility of the Footing Level at No.4 Bridge.
8	10/20	Tue		Meeting with Local contractors to request the cost estimations and hearing some information.
9	10/21	Wed		Site Survey for the Construction Area of Bridge No.4 for outline of the construction area.
10	10/22	Thu		Meeting with Local contractors to request the cost estimations and hearing about some information.
11	10/23	Fri		Topografic Survey of Right of Way along the Hotel side to clear its boundry with the Approach Road of No.7 Bridge. Received document of copy of approval for Car Basement Construction with stamps of MOPI from Anseba Hotel.
12	10/24	Sat		Meeting with the Engineer of Consultant for Hotel Construction to check their appoval document to make cler the problem and site check with this document
13	10/25	Sun		Preparation of Report for the Hotel Construction Area Occupatioin in the Right of Way of Approach Road of Bridge No.7
14	10/26	Mon		Meeting with JICA South Sudan Office for Occupation of Right of Way of No.7 Bridge Construction by New Hotel Construction Area.　Preparation for Concrete Stakes of Right of Way along the Hotel side to clear its boundry(No.7 Bridge).
15	10/27	Tue		Meeting among MTRB,MOPI,Anseba Hotel and CTII at Site of No.7 Bridge to investigate the Right of Way and discussion among them to decide the solution Preparation for BM and Reference points in the Bridge No.7.
16	10/28	Wed		Preparation for the Agreement of Right of Way to remove the Hotel Construction Area outside of the Right of Way. Preparation for BM and Reference points in the Bridge No.7.
17	10/29	Thu		Agreement signs among MTRB,MOPI and Anseba Hotel Reprentative for Removalof the Hotel Construction Area from the Ridht of Way of the Bridge No.7.
18	10/30	Fri		Meeting with JICA of South Sudan to explain the Solution of above solution. Preparation for BM and Reference points in each Bridges No.10.
19	10/31	Sat		Preparation for BM and Reference points in each Bridges No.10.
20	11/1	Sun		Internal work for preparation of Technical Notes
21	11/2	Mon		Preparation for Final Obstruction Drawing.　No.7 Bridge/ Arrange the design for Hotel Entrance Level& Location　Preparation for BM and Reference points in each Bridges No.4.
22	11/3	Tue		Meeting with MOPI to confirm the Construction Yard and final Obstruction Area Preparation for BM and Reference points for Right of Way in Bridges No.4.
23	11/4	Wed		Meeting with MTRB on Technical Notes to sign by Mr.Gabriel Makur,Undersecretary and Mr.Otim Bong,Acting Director Meeting with MOPI on Technical Notes to sign By Mr.John Bullen,Director General Preparation for BM and Reference points in each Bridges No.1.
24	11/5	Thu		Meeting with Mr.Kondo of Consultant TEC International on the Project for the Improvement of Water Spply System of Juba in South Suda to explain him the bridge construction area and to avoid the future problem. Preparation for BM and Reference points in each Bridges No.1.
25	11/6	Fri		Site Vist with MOPI to show them final Obstructions to be removed and Conctrete stakes with rebar/nail to indicate the Right of Way to reserve these area
26	11/7	Sat		Internal work for preparation of Survey Report
27	11/8	Sun		Internal work for preparation of Survey Report
28	11/9	Mon		Meeting with Jica to report the work result of Study Team
29	11/10	Tue		Departure from Juba to Nairobi and Nairobi to Dubai
30	11/11	Wed		From Dubai to Narita

2016 年

			総括 Team Leader 坂部 英孝 Mr. SAKABE Hidetaka	業務主任/交通計画 Chief Consultant/ Highway Planner 溝田 祐造 Mr. MIZOTA Yuzo
1	3/12	Sat		22:00 Departure from Tokyo (EK319)
2	3/13	Sun	19:45 Departure from Tokyo (ET673)	05:00 Arrival at Dubai (EK319) 10:35 Departure from Dubai (EK719) 14:45 Arrival at Nairobi (EK719)
3	3/14	Mon	07:20 Arrival at Addis Ababa (ET673) 9:27 Departure from Addis Ababa (ET356) 11:27 Arrival at Juba (ET356)	08:35 Departure from Nairobi (KQ350) 10:20 Arrival at Juba (KQ350)
			16:00 Meeting with JICA Office	
4	3/15	Tue	9:00 to 11:00 Explanation of the summary of draft final report and M/D to MTRB 14:00 to 17:00 Site reconnaissance of project bridges	
5	3/16	Wed	9:00 Explanation of the summary of draft final report to MTRB 15:00 to 17:00 Discussion and signing of MD with MTRB 17:00 to 18:00 Courtesy call to Japanese Embassy	
			11:00 to 12:00 Explanation of the results of MD to JICA Office	
			16:10 Departure from Juba(ET357) 18:10 Arrival at Addis Ababa (ET357) 22:20 Departure from Addis Ababa (ET672)	15:00 to 17:00 Site visit to confirm the bench mark at Bridge No.7
7	3/18	Fri	18:45 Arrival at Tokyo (ET672)	10:00 to 12:00 Explanation of draft final report to MTRB 13:00 to 17:00 Site visit to confirm the drawings and obstructions with MOPI
8	3/19	Sat		Site visit to confirm the drawings with MOPI
9	3/20	Sun		Site survey to adopt ramp type footpath instead of steps
10	3/21	Mon		11:00 to 12:00 Meeting with South Sudan Roads Authority 14:00 to 15:00 Site visit to confirm drawings with MOPI
11	3/22	Tue		10:00 to 12:00 Explanation of drawings to MTRB 14:30 to 15:30 Meeting with Bank of South Sudan
12	3/23	Wed		8:00 to 12:00 Site survey to adopt ramp type footpath 14:00 to 17:00 Site visit to confirm drawings
		Thu		10:00 to 12:00 Explanation of drawings to MTRB and MOPI 15:00 to 16:00 Meeting with JICA office
14	3/25	Fri		11:10 Departure from Juba 12:50 Arrival at Nairobi (KQ351) 16:40 Departure from Nairobi 22:40 Arrival at Dubai (EK720)
15	3/26	Sat		02:55 Departure from Dubai (EK318) 17:20 Arrival at Tokyo (EK318)

資料 3　関係者（面会者リスト）

3. 関係者（面会者）リスト

Ⅰ Government of South Sudan	
Ministry of Transport, Roads and Bridges	
Mr. Kuong Danhier Gatluak	Minister
Mr. Simon Mijok Mijak	Deputy Minister
Mr. Gabriel Makur Amour	Undersecretary
Mr. Jermiah Turic Bairiak	Director General
Mr. Otim Bong Mike	Acting Director of Transport, Roads and Bridges
Mr. Duku George	Acting Director for Bridges (Department for Roads and Bridges)
Mr. Philip Thon	Senior Inspector for Roads (Department for Roads and Bridges)
Mr. Aduot Madil	Road Engineer (project management team)
Ⅱ Government of Central Equatoria State	
Ministry of Physical Infrastructure	
Mr. John Bullen	Director General, MOPI
Mr. Emmanual Wani Matayo	Former Director General, MOPI
Mr. Roman Marghani Lukak	Director of Roads and Bridges Juba, MOPI
Mr. Dominic Pitia	Acting Director General for MOPI
Mr. Peter Laku Loro	Director of Roads and Bridges
Mr. Anthony Peter	Division Engineer and Acting Director of Housing
Ⅲ South Sudan Road Authority	
Mr. Kenyatta Warille	Executive Director
Mr. Edwin Rokani Ikudri	Director for Maintenance
Mr. John Deng Diar	Director for Projects
IV Bank of South Sudan	
Mr. Albino Dak Othow	Director General for Currency and Banking Operation
V 在南スーダン日本国大使館	
紀谷　昌彦	特命全権大使
松波　康男	一等書記官
VI JICA 南スーダン事務所	
古川　光明	所長
河合　正吉	企画調整員

資料 4　討議議事録（M/D）

資料 4-1　討議議事録（M/D）2013 年 3 月
資料 4-2　Technical Notes　2013 年 6 月
資料 4-3　EIA License　2013 年 10 月
資料 4-4　Technical Notes　2015 年 10 月
資料 4-5　Technical Notes　2015 年 11 月
資料 4-6　討議議事録（M/D）2016 年 3 月
資料 4-7　Technical Note　2016 年 3 月

4. 討議議事録(M/D)

「1 次調査」の実施調査結果を討議議事録「4-1」「4-2」として添付する。また、「4-3」として、環境省発行の「EIA License」を添付する。一方、「2 次調査」調査結果を「4-4」「4-5」に記載する。

資料 4-1　討議議事録（M/D）2013 年 3 月

MINUTES OF DISCUSSIONS
ON THE PREPARATORY SURVEY (OUTLINE DESIGN STUDY)
ON THE PROJECT FOR CONSTRUCTION LOLOGO BYPASS AND BRIDGES
IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN

In response to a request from the Government of the Republic of South Sudan (hereinafter referred to as "RSS"), the Government of Japan decided to conduct a Preparatory Survey for Outline Design (hereinafter referred to as "the Survey") on the Project for Construction of the Lologo Bypass and Bridges in Juba City (hereinafter referred to as "the Project"), and entrusted the study to Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent the Preparatory Survey Team for Outline Design (hereinafter referred to as "the Team") to South Sudan. The Team is headed by Mr. Jitsuya Ishiguro, Advisor, Transportation and ICT Division 2, Economic Infrastructure Department, JICA and is scheduled to stay in the country from 21 to 27 March 2013.

The Team held a series of discussions with the officials of the Government of RSS and conducted a field survey at the Project area. In the course of the discussions, both sides have confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey Report.

Juba, 26 March 2013

Jitsuya Ishiguro
Leader
Preparatory Survey Team
Japan International Cooperation Agency

Eng. Jeremiah Turic Bairiak
Director General
Ministry of Roads and Bridges

Witness: Otim Bong
Acting Director for Roads and Bridges
Ministry of Roads and Bridges

Emmanuel Wani Matayo
First Director General
Ministry of Physical Infrastructure
Central Equatoria State

ATTACHMENT

1. Objective of the Project

The objective of the Project is to mitigate congestions and facilitate urban passenger and goods transportation in Juba, thereby contributing to economic and social development of South Sudan.

2. Project Sites

The Project sites are in Juba as shown in Annex-1.

3. Responsible and Implementing Organizations

The responsible agency of the Project is the Ministry of Roads and Bridges (hereinafter referred to as "MRB"). The implementing agency of the Project is the Ministry of Physical Infrastructure, the Government of Central Equatoria State (hereinafter referred to as "MOPI"). The organization charts are shown in Annex 2.

4. Items requested by the Government of South Sudan

4-1. As a result of discussions, the requested components were confirmed as follows.

(1) Construction of Lologo bypass

(2) Construction of bridges and/or culverts in Juba city

4-2. JICA will assess the appropriateness of the request through the Survey and will report the findings to the Government of Japan. Implementation of the Project will be decided by the Government of Japan.

5. Japan's Grant Aid Scheme

5-1. The South Sudan side has shown a full understanding to the Japan's Grant Aid Scheme explained by the Team, as described in Annex 4 and 5.

5-2. The South Sudan side will take the necessary measures, as described in Annex-6, for smooth implementation of the Project.

6. Environmental and Social Considerations

6-1. The Team explained that during the course of the Survey information on environmental and social considerations including major impacts and relevant mitigation measures will be summarized in the Environmental Checklist attached as Attachment

6-2. Both sides confirmed that JICA will help MRB and MOPI conduct necessary procedures concerning the environmental assessment (including stakeholder

meetings, EIA, RAP etc.) and MRB and MOPI will take necessary actions to obtain official approval from the responsible authorities.

6-3. The South Sudan side agreed to arrange the budget allocation for land acquisition, resettlement and compensation for the Project Affected Persons (PAPs) and to take necessary measures for PAPs and secure the land.

7. Schedule of the Study

7-1. The Team will proceed with further studies in South Sudan until June 2013.

7-2. JICA will prepare a draft final report in English and dispatch a mission to South Sudan in order to explain its contents around December 2013.

7-3. When the contents of the report is accepted in principle by the Government of South Sudan, JICA will complete the final report in English and send it to the Government of South Sudan around February 2014.

8. Other Relevant Issues

8-1. The South Sudan side confirmed that the following undertakings should be taken by the South Sudan side at the South Sudan expenses under the Project.

(1)To provide tax exemption for construction materials and equipment for the Project

(2)To provide land necessary for the Project including detour, camp yard and temporary construction yard

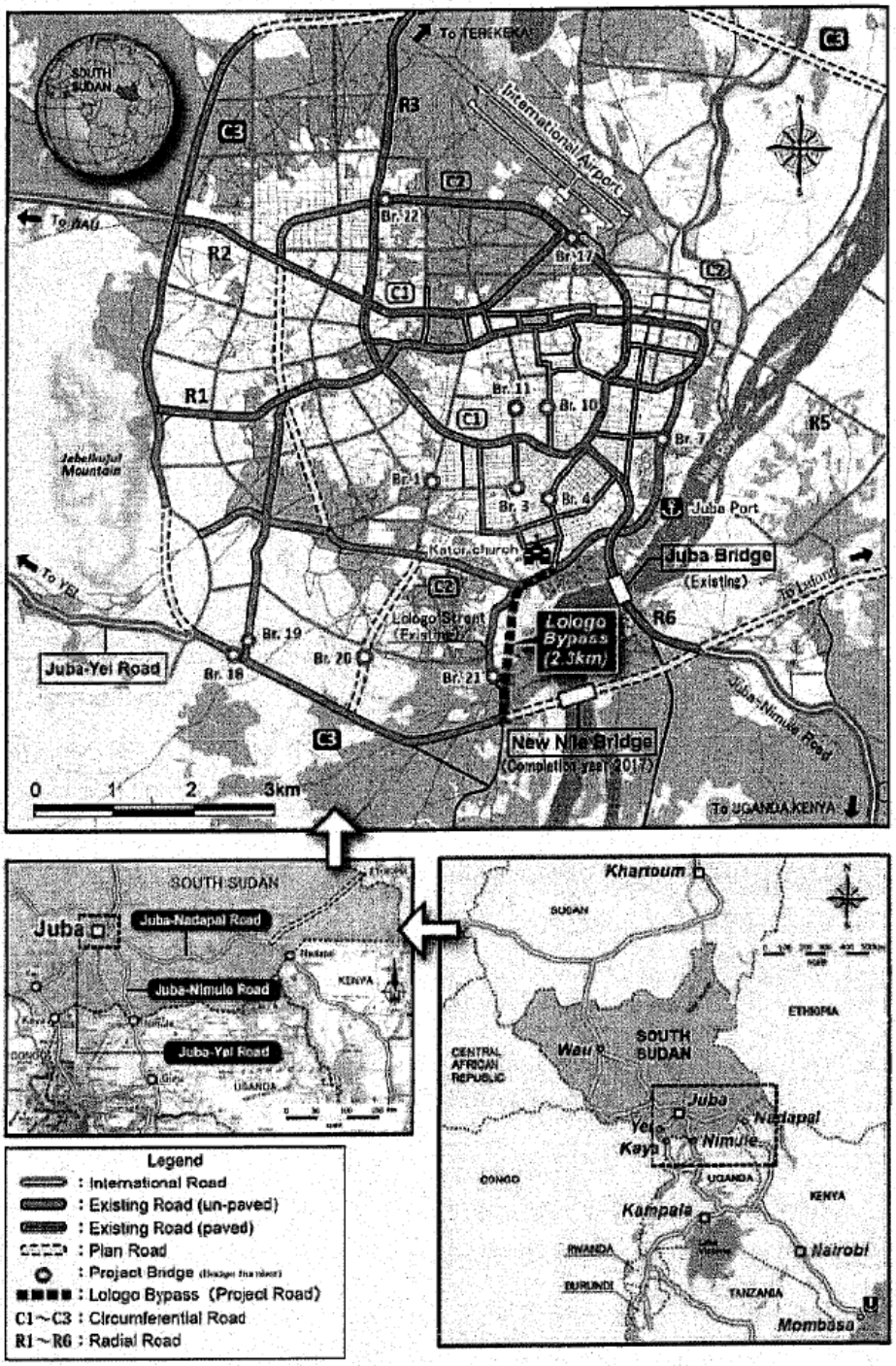
(3)To remove existing obstacles

(4)To arrange necessary traffic control at necessary sections

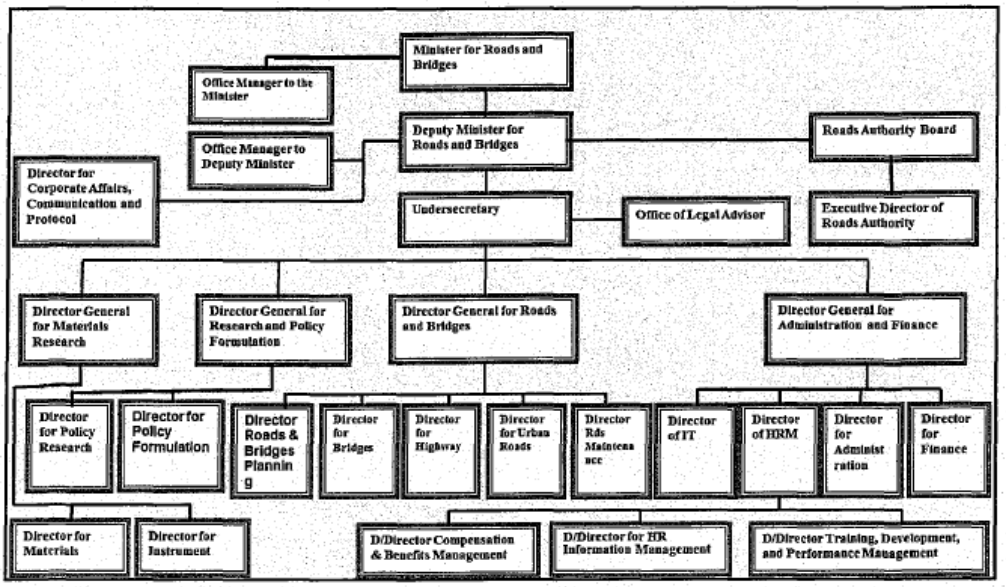
(5)To secure site for borrow pit and disposal area

8-2. The South Sudan side shall secure enough budget and personnel necessary for the operation and maintenance of the road and bridges constructed by the Project, including the routine and periodical maintenance work after the completion of the Project.

Annex-1 Project Site
Annex-2 Organization Chart of MRB
Annex-3 Organization Chart of MOPI
Annex-4 Japan's Grant Aid
Annex-5 Flow Chart of Japan's Grant Aid Procedures
Annex-6 Major Undertakings to be taken by Each Government



Location Map


Minister for Roads and Bridges
Office Manager to the Minister
Deputy Minister for Roads and Bridges
Roads Authority Board
Office Manager to Deputy Minister
Director for Corporate Affairs, Communication and Protocol
Undersecretary
Office of Legal Advisor
Executive Director of Roads Authority
Director General for Materials Research
Director General for Research and Policy Formulation
Director General for Roads and Bridges
Director General for Administration and Finance
Director for Policy Research
Director for Policy Formulation
Director Roads & Bridges Plannin g
Director for Bridges
Director for Highway
Director for Urban Roads
Director Rds Maintena nce
Director of IT
Director of HRM
Director for Administ ration
Director for Finance
Director for Materials
Director for Instrument
D/Director Compensation & Benefits Management
D/Director for HR Information Management
D/Director Training, Development, and Performance Management

MoPI (Directorate of Roads and Bridges) Organization Structure (Draft)

JAPAN'S GRANT AID

The Government of Japan (hereinafter referred to as "the GOJ") is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures :

・Preparatory Survey
- The Survey conducted by JICA

・Appraisal &Approval
-Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet

・Authority for Determining Implementation
-The Notes exchanged between the GOJ and a recipient country

・Grant Agreement (hereinafter referred to as "the G/A")
-Agreement concluded between JICA and a recipient country

・Implementation
-Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of a outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.
JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japan's Grant Aid Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be singed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

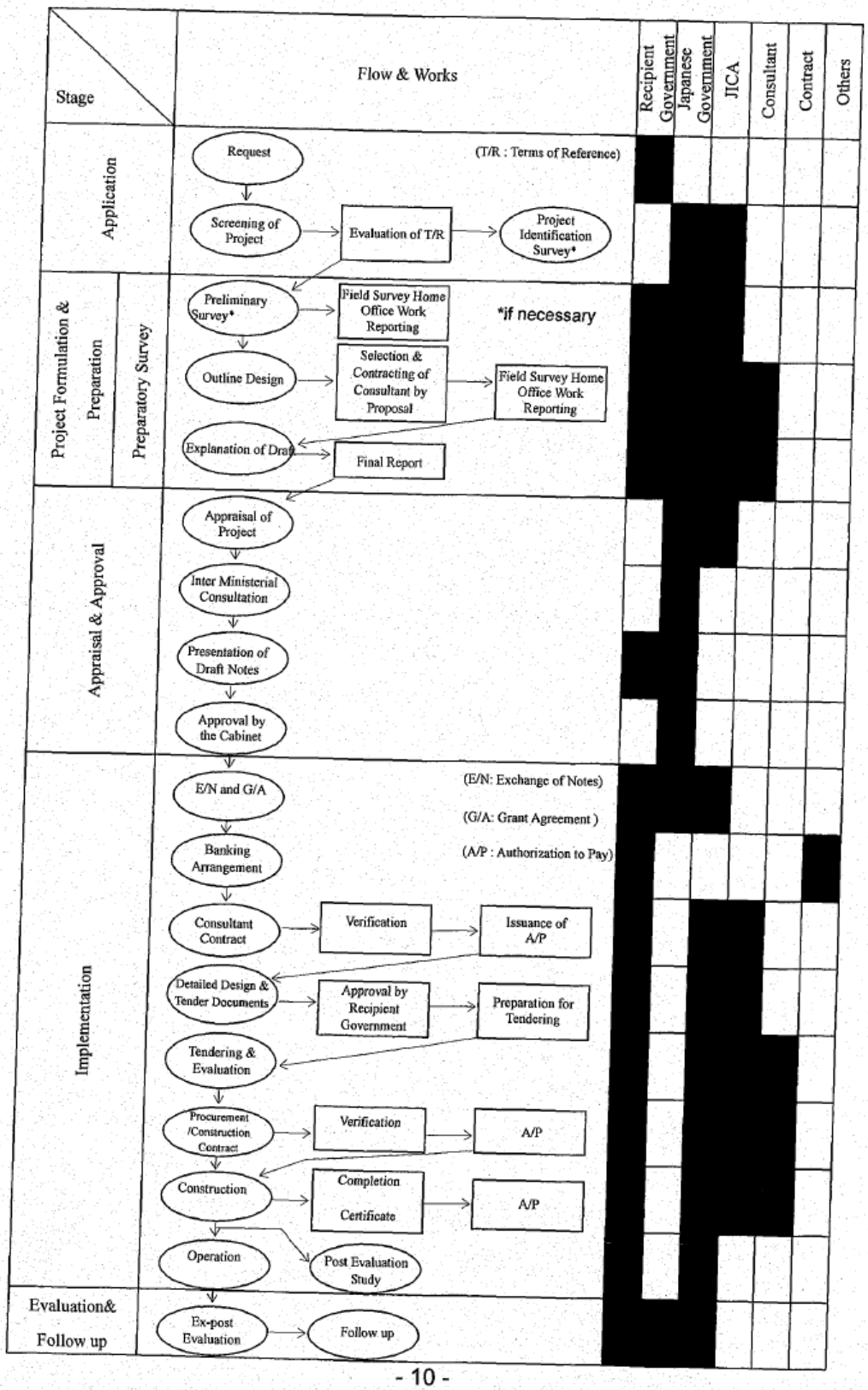
The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA guidelines for environmental and social considerations.

Annex-5

FLOW CHART OF JAPAN's GRANT AID PROCEDURES



Major Tasks to be Undertaken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by the Recipient Side
1	To secure land		●
2	To clear, level and reclaim the site when needed		●
3	To construct gates and fences in and around the site		●
4	To bear the following commissions to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
5	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine/Air/Land transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and customs clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
6	To accord Japanese nationals, whose service may be required in connection with the supply of the products and the services under the Verified Contract, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
7	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts		●
8	To maintain and use properly and effectively the facilities contracted and equipment provided under the Grant Aid		●
9	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and installation of the equipment		●

(B/A : Banking Arrangement, A/P : Authorization to Pay)

Attendant List

Subject: M/M Signing Meeting Date: 26 March 2013

No	Name	Organization	Contact	Signature
1	ENLKIANI	TILOPI		
2	LEWIS GORE	MOPI		
3	Jitshya Ishigmo	JICA		
4	PHILIP WAIWAI	MRB		
5	Jeremiah	MRB		
6	OTIM BOB	MRB		
7	Makiko Kimura	JICA		
8	Hamu Mamyai	MRB		
9	TAKASHI NAGAMA	CTI / JICA		
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

資料 4-2　Technical Notes　2013 年 6 月

Ministry of Roads and Bridges
Republic of South Sudan

Ministry of Physical Infrastructure, Central Equatoria
Republic of South Sudan

PREPARATORY SURVEY
ON

THE PROJECT FOR CONSTRUCTION
OF
THE LOLOGO BYPASS AND BRIDGES IN JUBA CITY
IN THE REPUBLIC OF SOUTH SUDAN

TECHNICAL NOTES

JUNE 2013

JAPAN INTERNATIONAL COOPERATION AGENCY

CTI ENGINEERING INTERNATIONAL CO., LTD.

Republic of South Sudan
Office's undersecretary
28 JUN 2013
Ministry Of Roads & Bridges

Preparatory Survey on the Project for Construction of
the Lologo Bypass and Bridges in Juba City
in the Republic of South Sudan

Technical Notes

JICA Survey Team for the Preparatory Survey (the Survey Team) has confirmed the items described in the attached Technical Notes concluded by the representative of the Ministry of Roads and Bridges (MRB) which is the responsible and implementing organization on the Project for Construction of the Lologo Bypass (as PART I) and Bridges (as PART II) in Juba City in the Republic of South Sudan (the Project), with representatives of concerned Ministries as the witnesses. Based on the Technical Notes, the Survey Team plans to conduct the basic design for the Project including the project cost estimate through analysis of the site survey findings after obtaining the approval from Japan International Cooperation Agency (JICA).

The results of the analysis and basic design are planned to be presented and explained in December, 2013.

Juba City, Republic of South Sudan
June, 2013

For

YUZO MIZOTA
Chief Consultant
JICA Survey Team

GABRIEL MAKUR
Undersecretary
Ministry of Roads and Bridges
Republic of South Sudan

JOHN BULLEN
Director General
Ministry of Physical Infrastructure
Central Equatoria State
(Witness)

OTIM BONG MIKE
Acting Director
Ministry of Roads and Bridges
Republic of South Sudan
(Witness)

1. Plan and Design

1.1 Design Standard to Apply

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

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

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 shall refer to other standards including;

4) AASHTO Policy on Geometric Design Highway and Streets, 2004
5) AASHTO LRFD Bridge Design Specifications, 4th Ed., 2007
6) AASHTO Standard Specifications for Highway Bridges, 17th Ed., 2002
7) Road Design Ordinances, Japan, 2004
8) Specifications for Highway Bridges, Japan Road Association, 2002
9) Specification for River Facilities, Japan River Association, 1998.

1.2 Bridge Plan

(1) Bridges Under Japan's Grant Aid

The bridges selected for the Japan's Grant Aid are six (6) as evaluated as "A rank"in total as shown in Table 2.1-1.

The location is shown in **Annex-1.**

Table 2.1-1 Evaluation Result

No.	Bridge Name	River	Payam	Evaluation Rank
1	Shuhada	Lobuliet	Kator	A
3	Salam	Lobuliet	Kator	C
4	Albino	Lobuliet	Kator	A
7	Salakana	Korbou	Juba	A
10	Kokora	Korbou	Juba	A
11	Lukabadi	Korbou	Juba	C
17	Lodoro	Lodoro	Juba	C
18	Korweliang 1	Weliang	Rajaf	A
19	Korweliang 2	Weliang	Rajaf	A
20	Korweliang 3	Weliang	Kator	C
21	Korweliang 4	Weliang	Kator	C
22	Saledo	Saledo	Juba	B
23	Lantor	Saledo	Munuki	B

A: High Urgency (the current problem is due to the bridge (missing link, traffic congestion, flood, structural soundness etc.,))
B: Middle Urgency (the problem is partly due to the bridge but requires other actions to take before construction of the bridge (ROW, road rehabilitation, flood mitigation etc.,)
C: Low Urgency (no existing road to the proposed bridge, very small traffic volume, existing of alternate road etc.,)

(2) **Road Typical Cross Section**

The road typical cross section shall follow the existing road plan in principal.
The typical road cross section is shown in **Annex-2.**

(3) **Bridge Design Condition**

The bridge design condition is shown in **Annex-3.**

1.3 Road Design

(1) **Design Speed**

The project bridge and approach roads are located in the center of Juba City. The design speed shall selected 50km/hr of Urban/Peri-Urban from South Sudan's design guideline.
However, in order to accommodate the road and bridges within present ROW the design speed might be reduced in order to avoid increase of affected structure and compensation.

(2) **Road Alignment（Horizontal and Profile）**

The design of the road alignment shall be followed by the South Sudan's design standard, AASHTO or Japan's Road Design Ordinances according the design speed.

(3) **Pavement Design**

The Asphalt Pavement shall be applied. The design axle load shall be ten (10) ton which is agreed as EAC(Eastern African Community) standard. Pavement Design Life shall be ten (10) years in consideration of availability of existing reliable data by the design method of AASHTO Guideline. Pavement configuration and design specification shall be as shown in Table 1.3-1.

Table 1.3-1 Pavement configuration and design specification

Location	Pavement	Design Specification
Carriage Way	Sub-base Course	More than CBR30
	Base Course	More than CBR80
	Wearing Course	Asphalt Concrete
Walk Way	Sub-base Course	More than CBR30
	Base Course	More than CBR80
	Wearing Course	Block Type

(4) **Road Drainage Design**

The design of road drainage facilities shall be referred to the design return period shown in Table1.4-1.

Table 1.4-1 Return Period for the Road Drainage Design

Structure Type	Return Period (Yrs)	Remark
Gutter and Inlets	2	
Bridge and Culverts	50	

(5) **Crossing Roads**

1) Maximum Slope and Pavement

The crossing road shall be smoothly adjusted to the Lologo Bypass at maximum slope of 7%. The crossing road shall be paved approximately 3m from the Lologo Bypass.

2) Pavement Structure of Crossing Road

Pavement structure of the crossing road shall be;
Base Course15cm, Asphalt Pavement 3cm

1.4 Bridge Design

(1) Superstructure

RC girder type shall be applied due to economical efficiency. The comparative study result is shown in **Annex-4**.

(2) Substructure (Foundation Type)

The Substructure type is selected according to the soil investigation result as shown in Table 1.4-1.

Table 1.4-1 Selection of Foundation Type

Bridge No	Type
Bridge No.1	Pile Foundation
Bridge No.4	Spread Foundation
Bridge No.7	Pile Foundation
Bridge No.10	Spread Foundation
Bridge No.18	Pile Foundation
Bridge No.19	Pile Foundation

(3) Bridge Pavement

Bridge shall be designed with the asphalt pavement of 5cm thickness. The walkway shall be block type.

(4) Bridge Railing Type

The concrete type shall be applied for the advantage of maintenance and cost. The comparative study result is shown in **Annex-5.**

(5) Joint

Expansion Joint type will be applied steel type joint, because of excellence for durability, maintenance, and economic efficiency.

(6) Approach Cushion Slab

Approach cushion slab will be installed behind abutment to prevent subsidence of embankment behind abutment.

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28 JUN 2013
Ministry Of Roads & Bridges

1.5 Crossing Road

(7) Maximum Slope and Pavement

The crossing road shall be smoothly adjusted to the Lologo Bypass at maximum slope of 7%. The crossing road shall be paved approximately 3m from the Lologo Bypass.

(8) Pavement Structure of Crossing Road

Pavement structure of the crossing road shall be;
Base Course15cm, Asphalt Pavement 3cm

1.6 Road Facilities

(1) Lane Marking

Center Line : To be included
Carriageway Line : To be included
Shoulder Line : Not applied (no shoulder)

(2) Street Lighting

The project is for rehabilitation of bridge and approach road only. The street lighting shall not be included.

(3) Guard Rail

Guard rail shall be installed at the portion where embankment or wall height is more than 2m.

2. Construction Plan

2.1 Size and Location of Construction Yard

The construction requires the temporary construction yard of 2ha(200mx100m). (The construction yard is supposed to be the same as Lologo Bypass.) The possible construction yard location is shown in **Annex-6.**

2.2 Borrow Pit, Quarry Sites and Disposal Sites

The possible location of borrow pit, quarry sites and disposal sites are shown in **Annex-6.**

2.3 Traffic Control

(1) Bridge No.1,4,7,10

These four (4) bridges shall be in the center of Juba City on the busy road. It is agreed to divert the traffic to the existing road during the construction. Temporary diversion for the pedestrians shall be considered in the design. The traffic diversion plan is shown in **Annex-7.**
The stage construction of the bridges shall be considered in the design in order to mitigate traffic safety, congestion and pedestrians inconveniences.

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(2) **Bridge No.18,19**

The major traffic is trucks and trailers from the factory along C3 at present condition. The No.18 shall be constructed earlier than No.19 so that Bridge No.18 can be used as diversion of the traffic. In this way it is not required any specific diversion to other road. Traffic diversion plan is shown in **Annex-8.**

3. Environmental and Social Consideration

3.1 ESIA

The environmental and social impact is limited because the project shall be on the existing ROW. It is confirmed the ESIA (Environmental and Social Impact Assessment) is sufficient to obtain required license.

4. Underground Utilities

4.1 Relocation required

The list of the underground utilities that require relocation is shown in Table 4.1-1.

Table 4.1-1 Utility Condition of each bridges

Bridge	Name	Water Supply	Electricity	Communication
Br.1	Shuhada	No	Overhead	There is communication line but it is already abandoned.
Br.4	Albino	No	Overhead	No
Br.7	Salakana	No	No	There is communication line but it is already abandoned.
Br.10	Kokora	There are ϕ 6inch pipeon the approach road. It is not passing the existing river.	No	No
Br.18	Weliang 1	No	No	No
Br.19	Weliang 2	No	No	No

4.2 Coordination for utility relocation

Based on the above mentioned facilities, MRB will coordinate with relevant authorities for relocation.

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28 JUN 2013
Ministry Of Roads & Bridges

5. Undertakings by Republic of South Sudan

5.1 Major Tasks to be Undertaken by Each Government

The major tasks to be undertaken by each government has been confirmed in the Minutes of Discussions dated on 26, March 2013 (**Annex-9**).

5.2 Tax Exemption Related to Construction

The RSS 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.

5.3 Secure of the Land

The RSS sides shall secure the land required for the construction.
The Table 5.3-1 shows required actions to be taken.

Table 5.3-1 Required actions to be taken for the bridge construction

Bridge	Land etc.,	Remark
No.1	Removal of excising bill board	The existing bill board is very close to the exaction of the foundation.
No.4	Part of existing restaurant	Only affected during the foundation excavation
No.7	Part of Concrete Block Wall	Only affected during the foundation excavation
No.10	Part of masonry wall (under construction)	Only affected during the foundation excavation
No.18 No.19	Justification of the wire fence installed at the site by law. To secure the land required for the bridge and future river improvement.	The existing fence might be illegal.

5.4 Permission for Aggregate/Soil Borrow Site

The RSS side shall obtain permissions for mining of aggregate/soil from the concerned authority and/or the private firm concerned for the possible locations of borrow site. The possible location is shown in 2.1.

5.5 Permission for Dumping Discarded Soil

The RSS side shall obtain permission of use of disposal area including discarded soil from the concerned authority and/or the private firm concerned for the possible locations for dumping discarded soil. The possible location is shown in 2.1.

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5.6 Acquisition of Construction Yard

The RSS side shall procure the construction yard 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. The possible location is shown in 2.1.

5.7 River Water Usage

The RSS side shall obtain exemption from the Nile River abstraction and permission for construction usage during the entire construction period from the Ministry of Water Resource Management and Irrigation.

5.8 Coordination with Traffic Control Concerned Authorities

The RSS shall take required coordination with traffic control concerned authorities to facilitate the construction work and ensure traffic safety near the project area.

5.9 Environmental License

The RSS shall apply for the environmental license required for implementation of the project in accordance with the environmental and social impact study result and resettlement plan.

5.10 Coordination with other project and authorities

The RSS shall take required monitoring and coordination with other project and authorities along the road to prevent any encroachment and increase of the compensation.
Especially, the road where Bridge No.18 and No.19 are located might be rehabilitated by RSS budget. The horizontal alignment, profile, typical cross section etc., need to be adjust the plan of Japan's Grant Aid.

5.11 Coordination on Underground Utilities

The MRB shall coordinate with SSUWC in regards to underground water pipe at Bridge No.10. The result of the coordination shall be informed to Japan side by 31 July 2013.

5.12 Others

MRB shall obtain required license or official approval for implementation of the project. MRB shall support for the engineers involved in the project for travel and stay in Republic of South Sudan.

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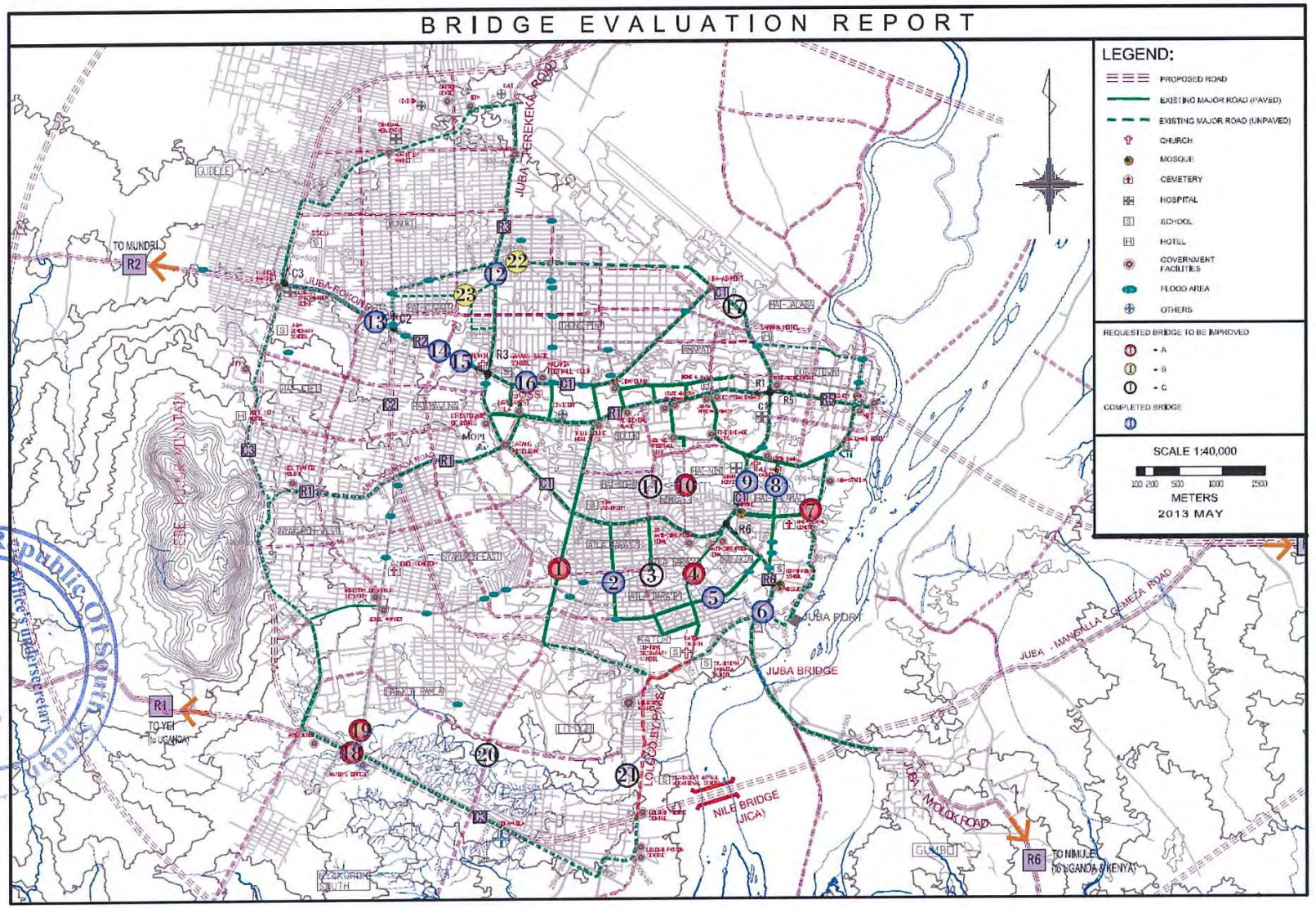
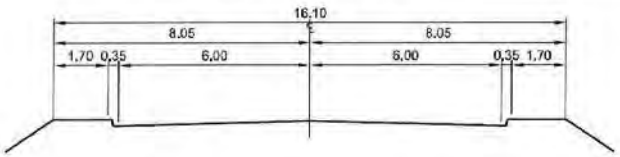
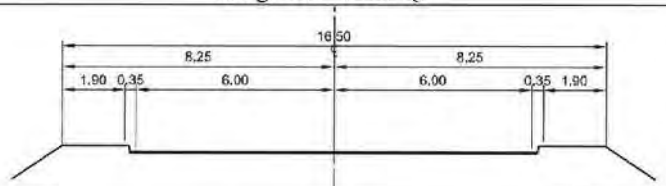
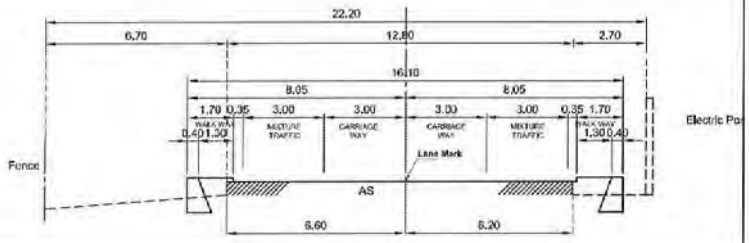
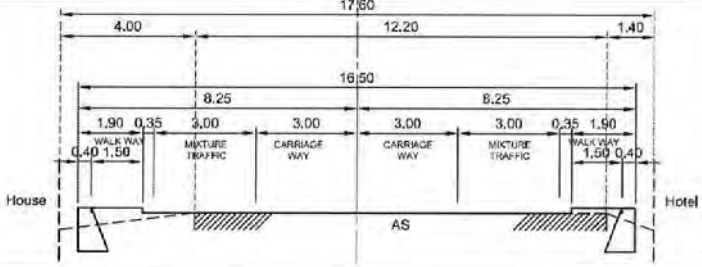
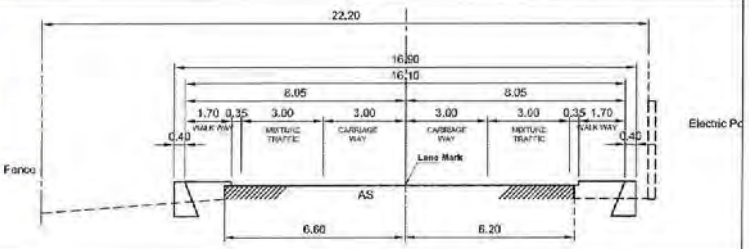
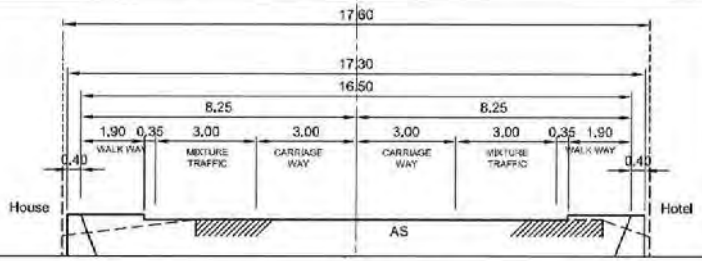
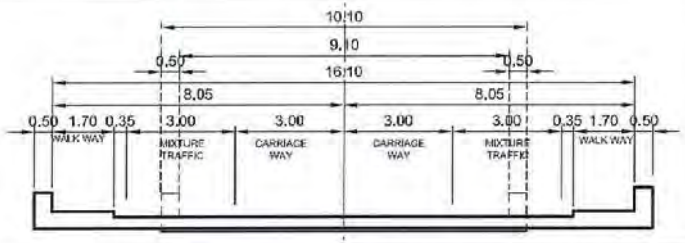
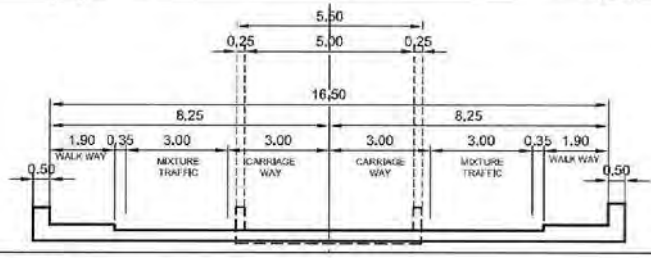
Annex-1

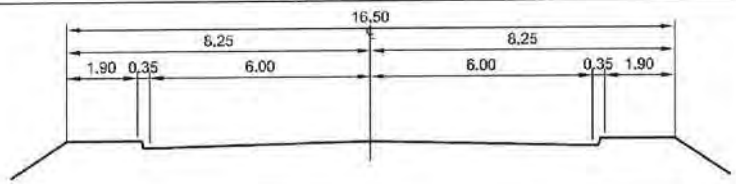
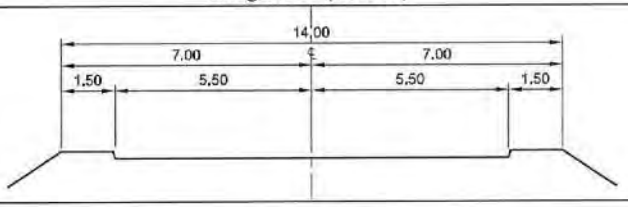
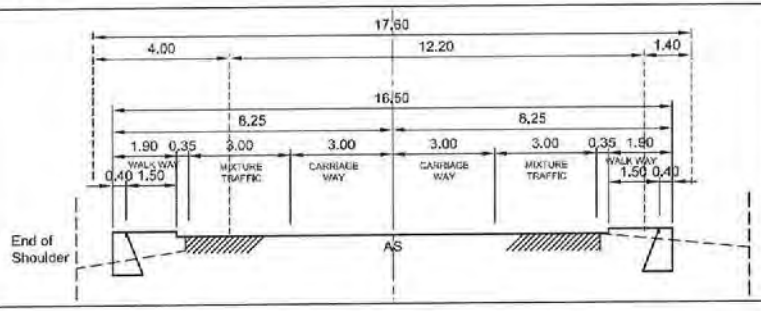
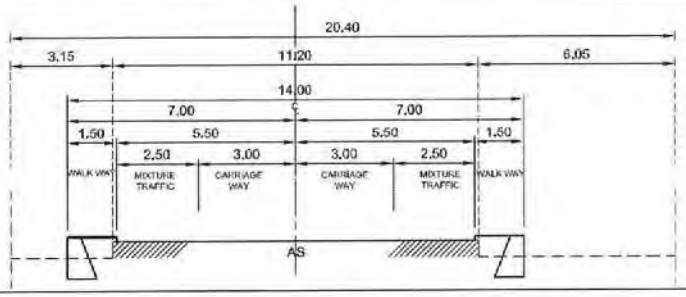
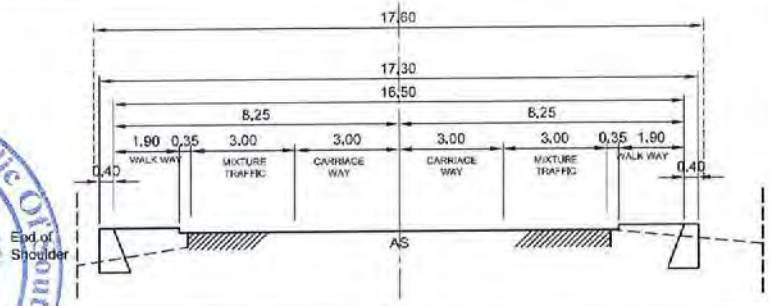
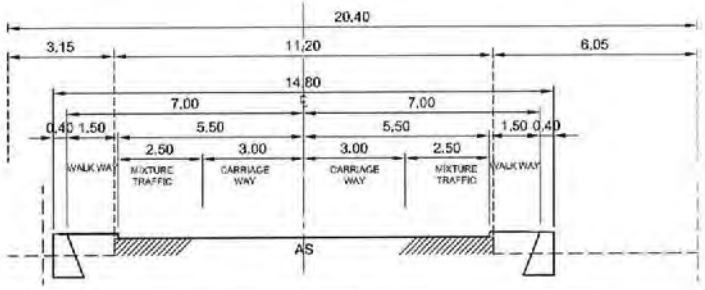
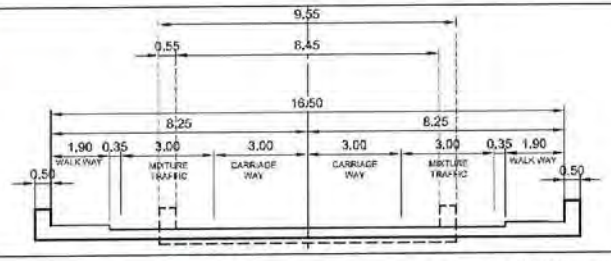
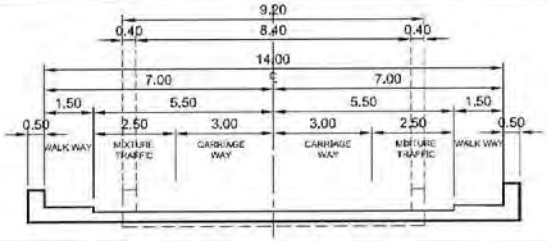


Annex-1 Locati p of the Bridges

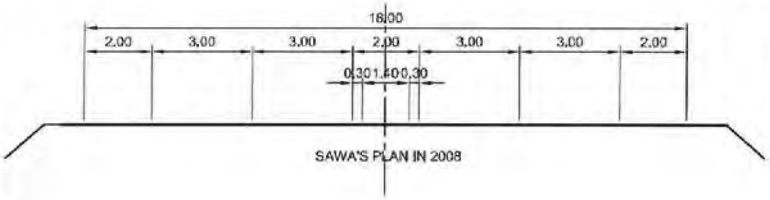
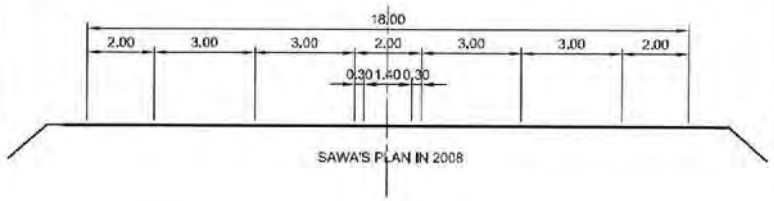
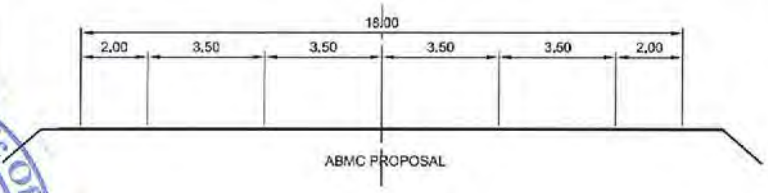
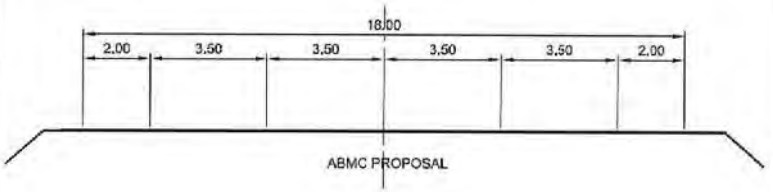
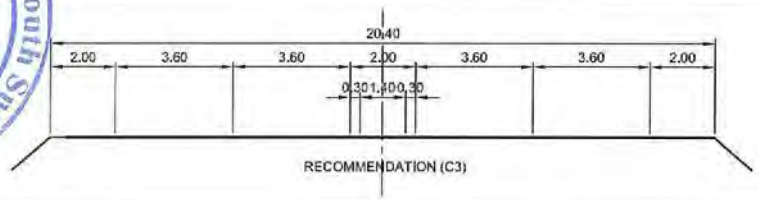
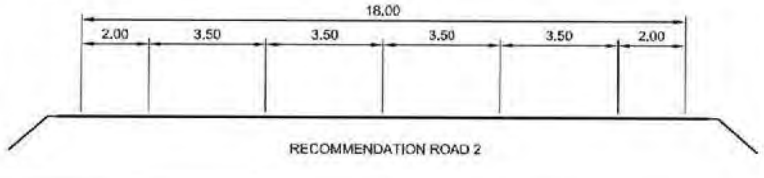
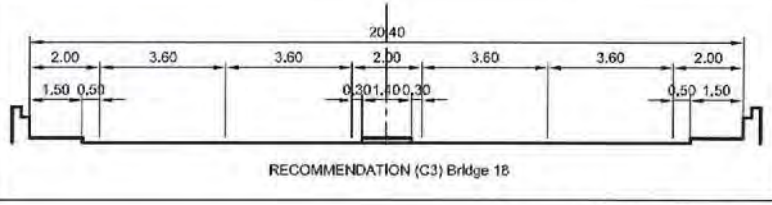
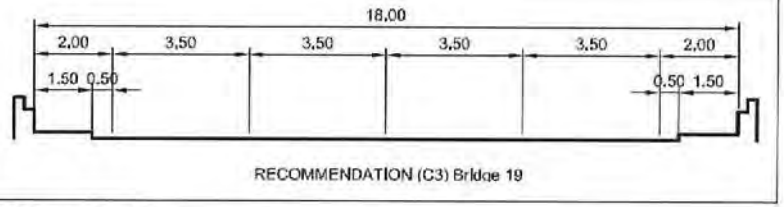
Annex-2

Bridge	BridgeNo.1 (Road C1)	BridgeNo.4 (Road Q)
Road Typical Cross Section		
Road H<2m		
Road H>2m		
Bridge		

Annex 2.1(1/3) Br ypical Cross Section

Bridge	BridgeNo.7 (Road F1b)	BridgeNo.10 (Road J3)
Road Typical Cross Section		
Road H<2m		
Road H>2m		
Bridge		

Annex 2.1(2/3) Bri ypical Cross Section

Bridge	BridgeNo.18	BridgeNo.19 (Road 2)
Road Typical Cross Section		
Road H<2m		
Road H>2m		
Bridge		

Annex 2.1(3/3) Bridge Typical Cross Section

Annex-3

Annex 3 Bridge Design Condition

Design Item			Criteria / Value
1.0 General	Design Reference		• Bridge Design Manual, Ministry of Transport and Roads, GOSS, 2006 • Geometric Design Manual, Ministry of Transport and Roads, GOSS, 2006 • Drainage Design Manual, Ministry of Transport and Roads, GOSS, 2006 • AASHTO LRFD Bridge Design Specifications, 5th Edition, 2012 • Specifications for Highway Bridges, Part I-V, Japan Road Association, 2012
	Road/Bridge Class		• Interstate Trunk Road (DS1)/Primary Arterial
	Bridge Section Length (m)		Refer Table-2
	Span Configuration (m)		Refer Table-2
	Design Speed (km/hr)		50
2.0 Geometry	Min. Horizontal Curve Radius (m)		150 (2.5%)
	Max. Gradient (%)		6
	Travel Lane Width (m)		2.5 – 3.5
	Sidewalk (m)		1.5 – 1.9
	Pavement Crossfall (%)		2.5
	Vertical Clearance on Roadway (m)		5.3 (GOSS BDM 2.4.5 for light structures)
	Vertical Clearance on Design Flood Level (m)		0.9 (GOSS BDM, DDM)
	Elevation of Design Flood Level (m)		Riverbed Level + 2.0m
3.0 Design Load	Live Load		HL-93 (AASHTO)
	Pedestrian Load (kPa)		4.0 (GOSS BDM 3.12)
	Flood Velocity (m/s)		1.8
	Base Wind Velocity, V_B (m/s)		45 (Open Country)
	Peak Ground Acceleration Coefficient		0.2
	Temperature	T_{max} (°C)	50
		T_{min} (°C)	15
4.0 Materials	Concrete Strength	Footing/Pile Cap (MPa)	24
		Bored Piles (MPa)	30
		Pier/Abutment/Retaining Wall (MPa)	24
		Slab/Railing (MPa)	24
		Slope Protection (MPa)	21
		Lean Concrete (MPa)	16
	Reinforcing Bars	Yield Strength, f_y (MPa)	415 (Over D16)
		Yield Strength, f_y (MPa)	276 (Less than D13)
Others			BDM, AASHTO, JARA

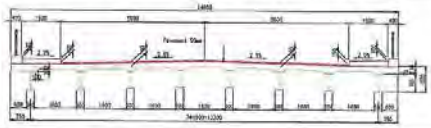
Table-2 List of Bridge Length and Span Length

Bridge No.	Bridge Length (m)	Span Length(m)
1	15.0	14.0
4	11.5	10.5
7	9.0	8.0
10	13.0	12.0
18	11.0	10.0
19	11.0	10.0
A	15.0	14.0

Republic Of South Sudan
Office's undersecretary
28 JUN 2013
Ministry Of Roads & Bridges

Annex-4

Annex-4 Comparative Study of Superstructure

	Option-1 RC Girder	Option-2 Steel Girder (H beam)
Typical Cross Section		
Structural feature	・Dead load is heavier than steel girder. (△) ・Low maintenance (◎)	・Dead load is lighter than RC girder (○) ・Need periodical maintenance (Repaint) (△)
Workability	・Almost materials can be procured in Juba. (○) ・All staging method is applied as construction method, so need to consider the period of flood season. (△)	・Need to procure of materials from other countries. (△) ・Crane erection method can be applied as construction method, so it is possible to work the erection during flood season. (○)
Construction Cost	1.0 (◎)	1.2 (△)
Construction Period	・Need to avoid the flooded season. (△) ・Construction period is almost as same as Steel girder. (○)	・Need to avoid the flooded season. (△) ・Construction period is almost as same as RC girder. (○)
Landscape and Environment	・It looks heavy compared to the steel girder because the girder height becomes higher than steel girder. (△)	・It can be given the impression of stylish because it is possible to keep low girder height as compared RC girder. (○)
Evaluation	○ RC girder is recommended since it is economic. And, it also is same as a request of the South Sudan government.	△

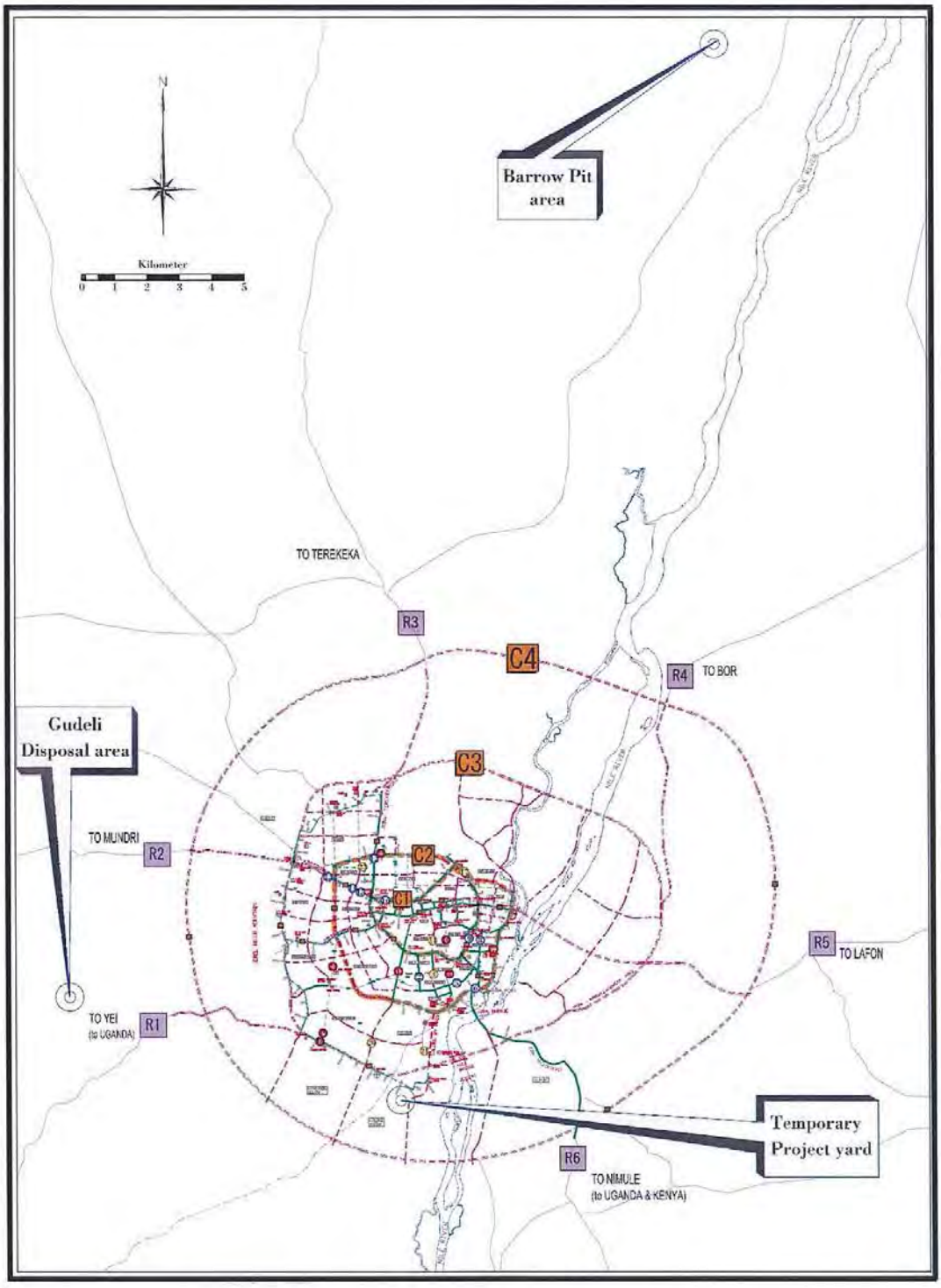
Annex-5

Annex-5 Bridge Railing Comparison

Option	(1) Concrete Wall Type	(2) Steel Post Type
Image View		
Characteristic	・This railing is made of whole concrete. ・Heavier than steel post type. ・Pedestrian feel a feeling of pressure. ・Dirt is conspicuous.	・This railing is made of steel. ・Lighter than concrete wall type. ・There is a feeling of opening compared with concrete. ・Dirt is not conspicuous.
Construction Cost	230 USD/m (23,000 JPY / m)	370USD/m (37,000 JPY / m)
Evaluation	○	△
Comment	The steel post type is not favorable in terms of maintenance including replacement in case any heavy accident occurs. The concrete type shall be selected for maintenance and cost.	

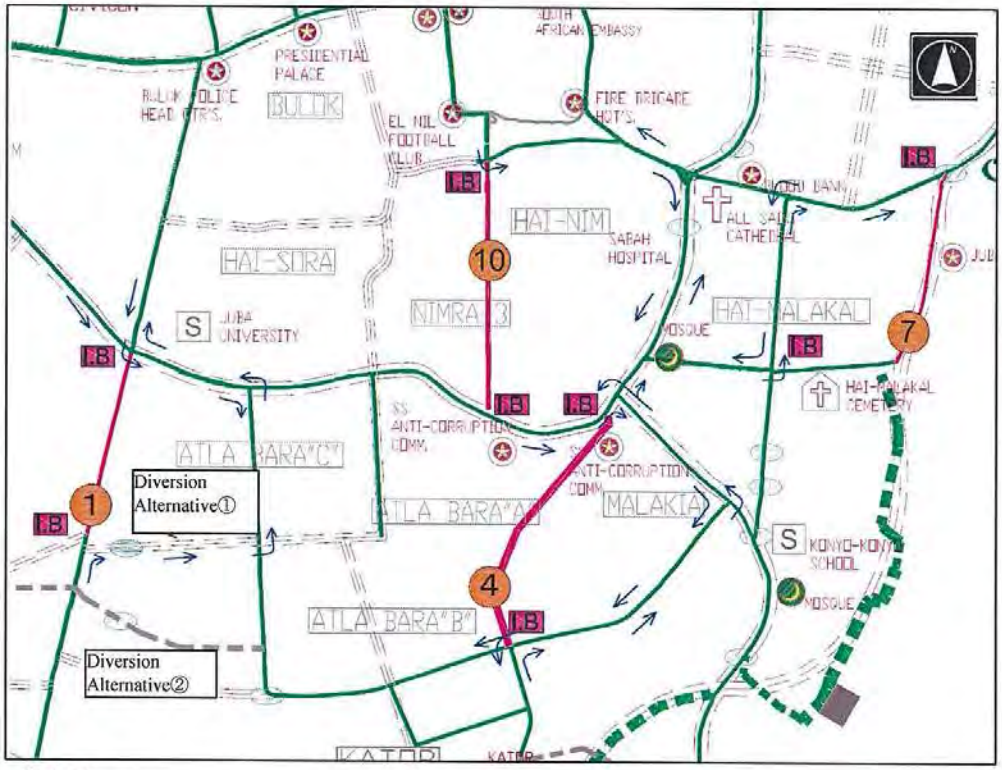
Republic Of South Sudan
28 JUN 2013
Ministry Of Roads & Bridges

Annex-6



Annex-6 Location of Borrow Pit and Disposal Sites

Annex-7



Legend

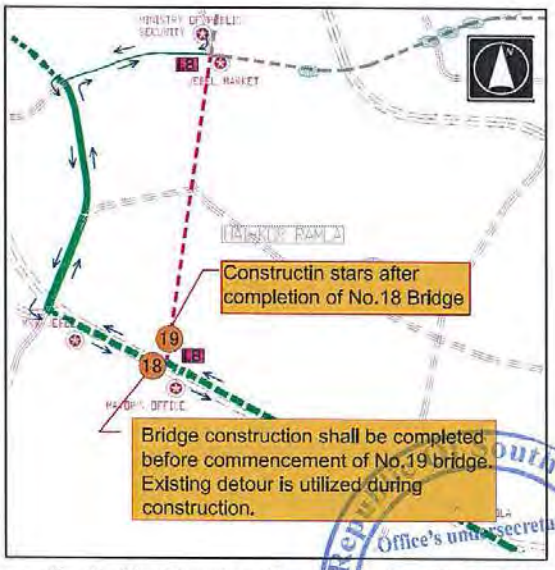
→ : Diversion Route

▬ : Limit of the Traffic During Construction

I.B : Sign Board

Annex-7 Traffic Diversion Plan for No.1、No.4、No.7、No.10Bridge

Annex-8



Annex-8 Traffic Diversion Plan for No.18、No.19Bridge

Annex-9

Major Tasks to be Undertaken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by the Recipient Side
1	To secure land		●
2	To clear, level and reclaim the site when needed		●
3	To construct gates and fences in and around the site		●
4	To bear the following commissions to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
5	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine/Air/Land transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and customs clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
6	To accord Japanese nationals, whose service may be required in connection with the supply of the products and the services under the Verified Contract, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
7	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts		●
8	To maintain and use properly and effectively the facilities contracted and equipment provided under the Grant Aid		●
9	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and installation of the equipment		●

(B/A : Banking Arrangement, A/P : Authorization to Pay)

Republic Of S... Office's undersecretary 20 JUN 2013 Ministry Of Roads &...

資料 4-3　EIA License　2013 年 10 月

REPUBLIC OF SOUTH SUDAN
MINISTRY OF ENVIRONMENT
Office of the Under Secretary

Ref: RSS/MoEnv/J/14/17　　02/10/2013

Undersecretary
Ministry of Roads and Bridges
Republic of South Sudan, Juba

Subject: Environmental Authorization for implementation of bridges rehabilitation Project

Reference is hereby made to your letter without number and dated August 19th, 2013 requesting the Ministry of Environment, RSS, Juba to issue an approval to undertake implementation of the project for rehabilitation of six bridges in Juba City, Republic of South Sudan.

Based on the review of the Environmental and Social Impact Assessment study report for the proposed rehabilitation project in accordance with the EIA requirements, the Ministry has granted an approval authorizing the Ministry of Road and Bridges to undertake implementation of the proposed project whose objective is rehabilitation of six small scale bridges of Shuhada, Albino, Salakana, Kokora, Weliang 1 and Weliang 2, all in Juba City subject to the following conditions to ensure environmentally sustainable development:

1. The proponent shall ensure compliance with the environmental management plan (EMP) (or Environmental and social management plan in Tables 25 & 26, pages 62 - 65) during the project cycle;
2. The project proponent shall ensure adherence to the occupational health and safety requirements for the workforce;
3. The proponent shall, during the construction phase, manage all potential impacts with standard procedures of good engineering practices pertaining to road maintenance project;
4. The proponent shall ensure that there must be control of pollution, traffic disruptions and nuisance;
5. The project proponent shall submit an environmental audit report in the first year of its operation to confirm compliance with best practices.

Victor Wurda LoTombe
Ag/Under Secretary
Ministry of Environment
RSS, Juba

REPUBLIC OF SOUTH SUDAN MINISTRY OF ENVIRONMENT 2 OCT 2013 OFFICE OF THE UNDERSECRETARY

CC:JICA, South Sudan, Juba

資料 4-4　Technical Notes　2015 年 10 月

Ministry of Transport, Roads and Bridges
Republic of South Sudan

PREPARATORY SURVEY
ON

THE PROJECT FOR CONSTRUCTION
OF
THE BRIDGES IN JUBA CITY
IN THE REPUBLIC OF SOUTH SUDAN

TECHNICAL NOTES

OCTOBER 2015

JAPAN INTERNATIONAL COOPERATION AGENCY

CTI ENGINEERING INTERNATIONAL CO., LTD.

Preparatory Survey on the Project for Construction of the Bridges in Juba City
in the Republic of South Sudan

Technical Notes

JICA Survey Team for the Preparatory Survey (the Survey Team) has confirmed the items described in the attached Technical Notes concluded by the representative of the Ministry of Transport, Roads and Bridges (MTRB) which is the responsible and implementing organization on the Project for Construction of the Bridges in Juba City in the Republic of South Sudan (the Project). Based on the Technical Notes, the Survey Team plans to conduct the basic design for the Project including the project cost estimate through analysis of the site survey findings after obtaining the approval from Japan International Cooperation Agency (JICA).

Juba City, Republic of South Sudan
October, 2015

for 平馬博之

YUZO, MIZOTA
Chief Consultant
JICA Survey Team

Ministry of Transport, Roads & Bridges
Undersecretary's Office
05 OCT 2015
Republic of South Sudan

GABRIEL MAKUR
Undersecretary
Ministry of Transport,
Roads and Bridges
Republic of South Sudan

OTIM BONG MIKE
Acting Director General
Ministry of Transport,
Roads and Bridges
Republic of South Sudan
(Witness)

1. Priority of Bridges

The priority of six (6) bridges to be constructed is divided into following two (2) groups due to the traffic volume and city activity convenience :

Priority of Bridge Construction	Bridge Number	Remarks
First Priority	Bridge No.1, Bridge No.4, Bridge No.7, Bridge No.10	High traffic volume and convenience in the city center
Second Priority	Bridge No.18, Bridge No.19	Low traffic volume along/near outer ring road

First Priority Bridges are targeted to be constructed under the Project.
Second Priority Bridges are not included under the Project.

2. Bridge Designs

(1) Bridge Pavement

Bridge shall be designed with the concrete pavement and concrete pavement shall be incorporated in the deck slab of the bridge.

(2) Joint

Expansion Joint type will be applied rubber type joint, because of excellence for durability, maintenance, and economic efficiency as actual experience.

3. Undertakings by Republic of South Sudan

The major tasks to be undertaken by the Republic of South Sudan(RSS) has been confirmed in the technical note dated on 28, June 2013. The following issues to be undertaken by Republic of South Sudan were additionally confirmed in this technical note after conducting site survey from 16th of September 16 to 5th of October, 2015.

(1) Pavement of Approach Roads to the Bridges

Pavement of Approach Roads to the Bridges is constructed by the RSS with his own finance, while the embankment will be constructed under the Project.

(2) Secure of the Land and Relocation of the Utilities

The RSS sides shall secure the land and the relocation of the utilities required for the construction. **The Table 1** shows **Requirements of the RSS for the Construction of the Bridges in Juba City** to be taken.

And the drawing of the locations for the obstructions are shown in **Annex-1**.

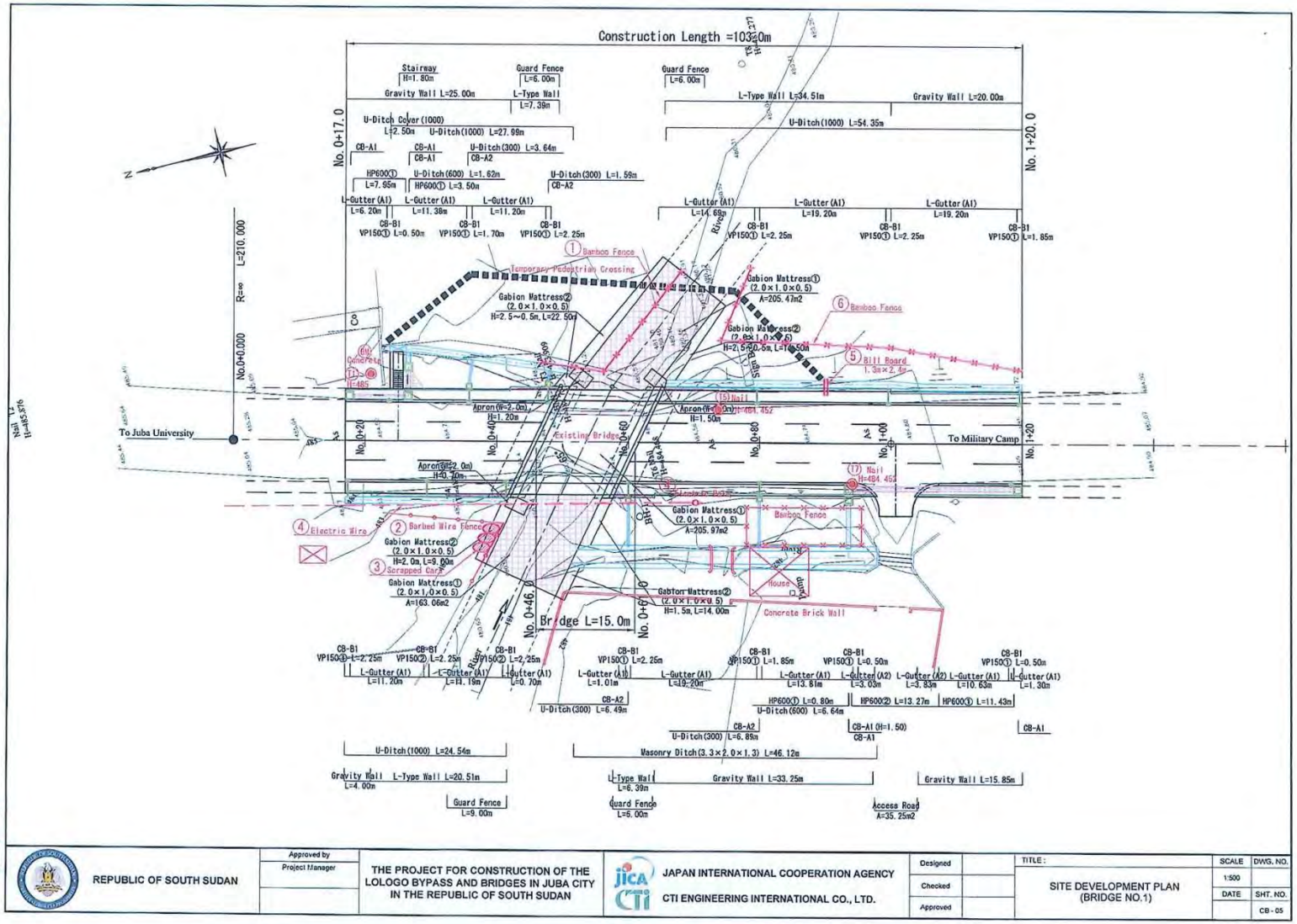
The fund, 1,500,000 SSP, for the **Requirements of the same** already has been allocated by MTRB.

Table-1 Requirements of the RSS for the Construction of the Bridges in Juba City

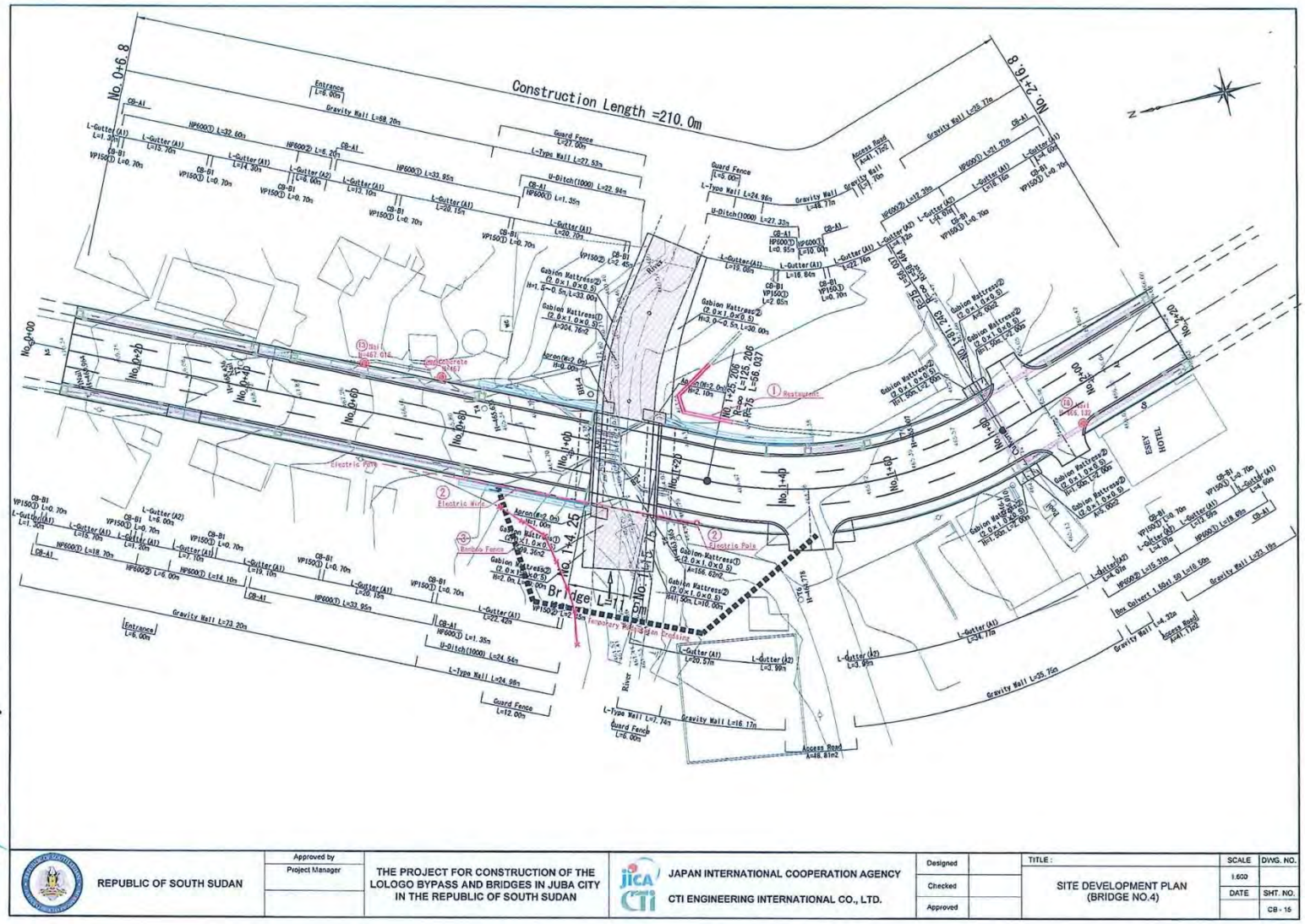
Bridge Name	Items	Obstruction(Land, Fence, Masonry Wall, e.t.c.)	Quantity of Obstruction
No.1	①	Removal of existing Bamboo Fence	26m
	②	Removal of existing Barbed Wire Fence	16m
	③	Removal of existing Scrapped Cars	6 cars
	④	Removal of existing Electric Wire and Pole	110m
	⑤	Removal of existing Bill Board 1.3mx2.4m	1 unit
	⑥	Removal of existing Bamboo Fence	21m
No.4	①	Removal of part of existing Restaurant	27m2
	②	Removal of existing Electric Wire and Pole	120m
	③	Removal of existing Bamboo Fence	30m
No.7	①	Removal of existing Corrugated Plate Galvanized Fence	72m
	②	Removal of existing Masonry Wall	12m
	③	Removal of existing Bamboo Fence	40m
	④	Removal of existing Corrugated Plate Galvanized Fence	32m
	⑤	Removal of existing Sign Board 3mx2m	1 unit
No.10	①	Removal of Brick and Masonry Wall	8m
	②	Demolition of existing Concrete Box (1.9mx4.8m)	9.2m2
	③	Removal of existing Bamboo Fence	16m
	④	Removal of existing Bamboo Fence	25m
No.18	①	Removal of existing Barbed Wire Fence	176m
	②	New Wire Mesh Fence Constructed	-
	③	Removal of New Cultivated Yard	1520m2
No.19	①	Removal of existing Barbed Wire Fence	217m
	②	Occupation of this Area	-

ANNEX-1

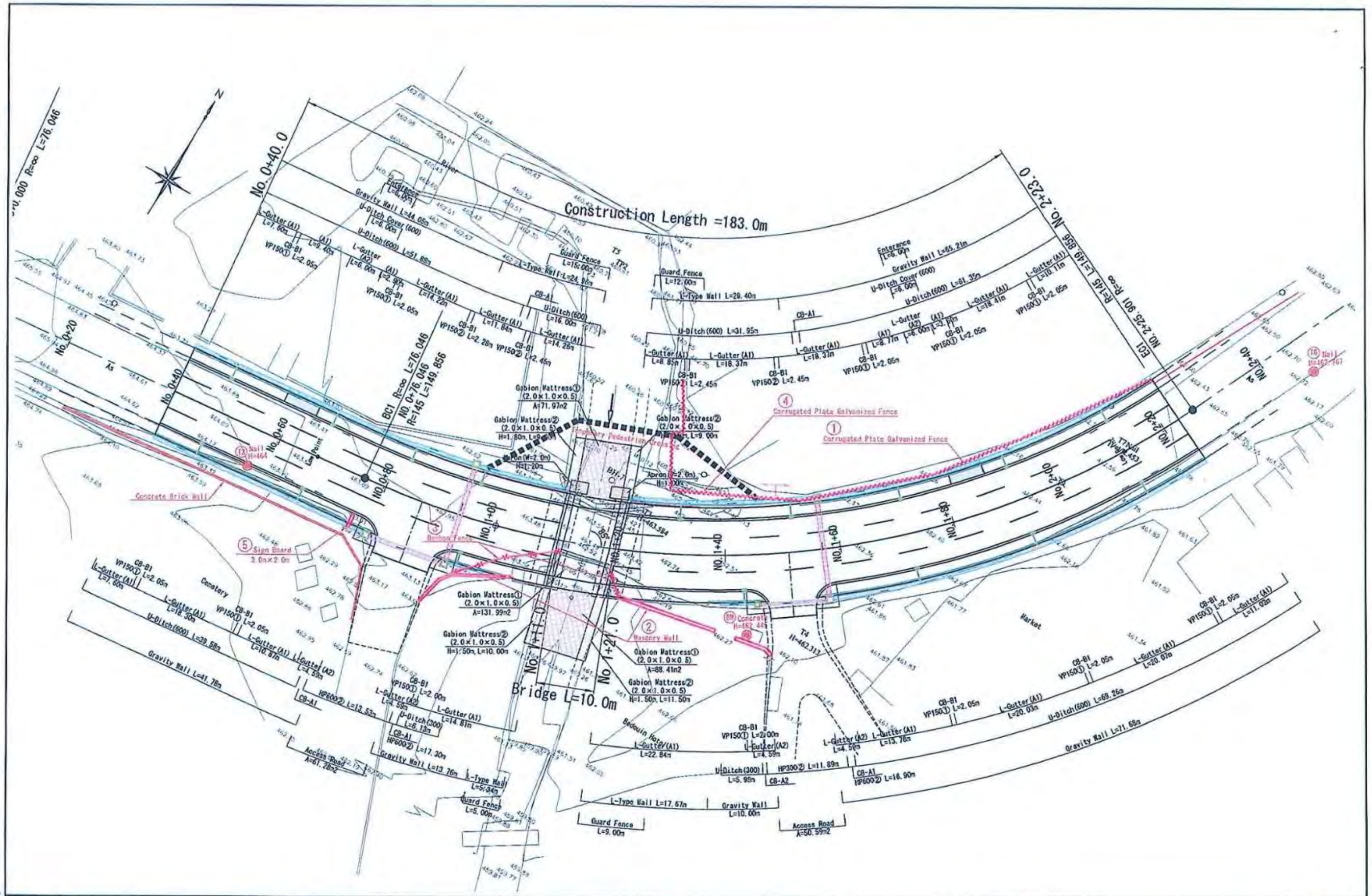
Drawings for Removal of the Obstructions



REPUBLIC OF SOUTH SUDAN	Approved by Project Manager	THE PROJECT FOR CONSTRUCTION OF THE LOLOGO BYPASS AND BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed Checked Approved		TITLE: SITE DEVELOPMENT PLAN (BRIDGE NO.1)	SCALE 1:500 DATE DWG. NO. SHT. NO. CB-05



REPUBLIC OF SOUTH SUDAN	Approved by: Project Manager	THE PROJECT FOR CONSTRUCTION OF THE LOLOGO BYPASS AND BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY / CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed / Checked / Approved		TITLE: SITE DEVELOPMENT PLAN (BRIDGE NO.4)	SCALE: 1:600 / DATE / SHT. NO.: CB-15



REPUBLIC OF SOUTH SUDAN	Approved by Project Manager	THE PROJECT FOR CONSTRUCTION OF THE LOLOGO BYPASS AND BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed Checked Approved	TITLE: SITE DEVELOPMENT PLAN (BRIDGE NO.7)

SCALE	DWG. NO.
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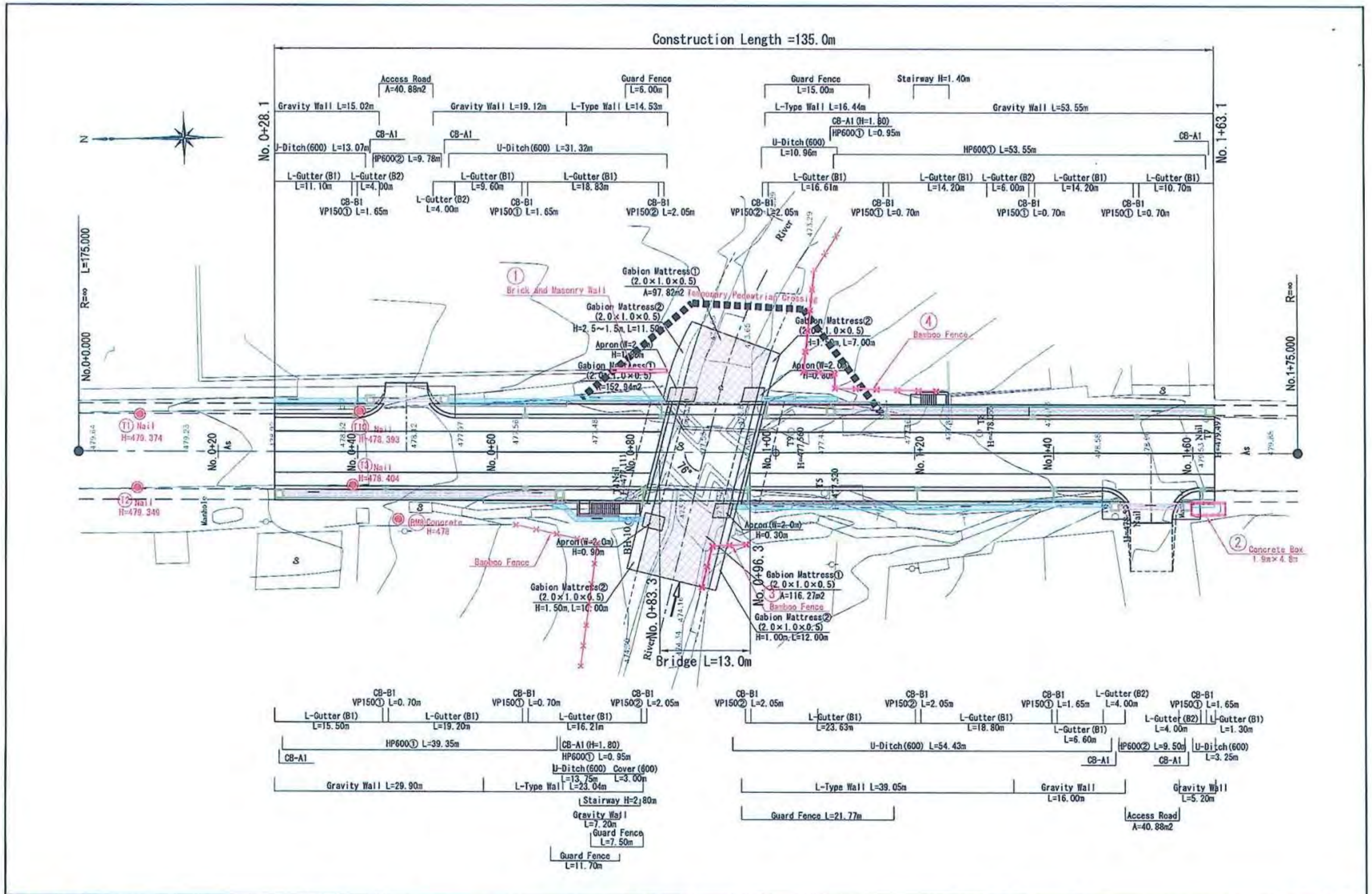
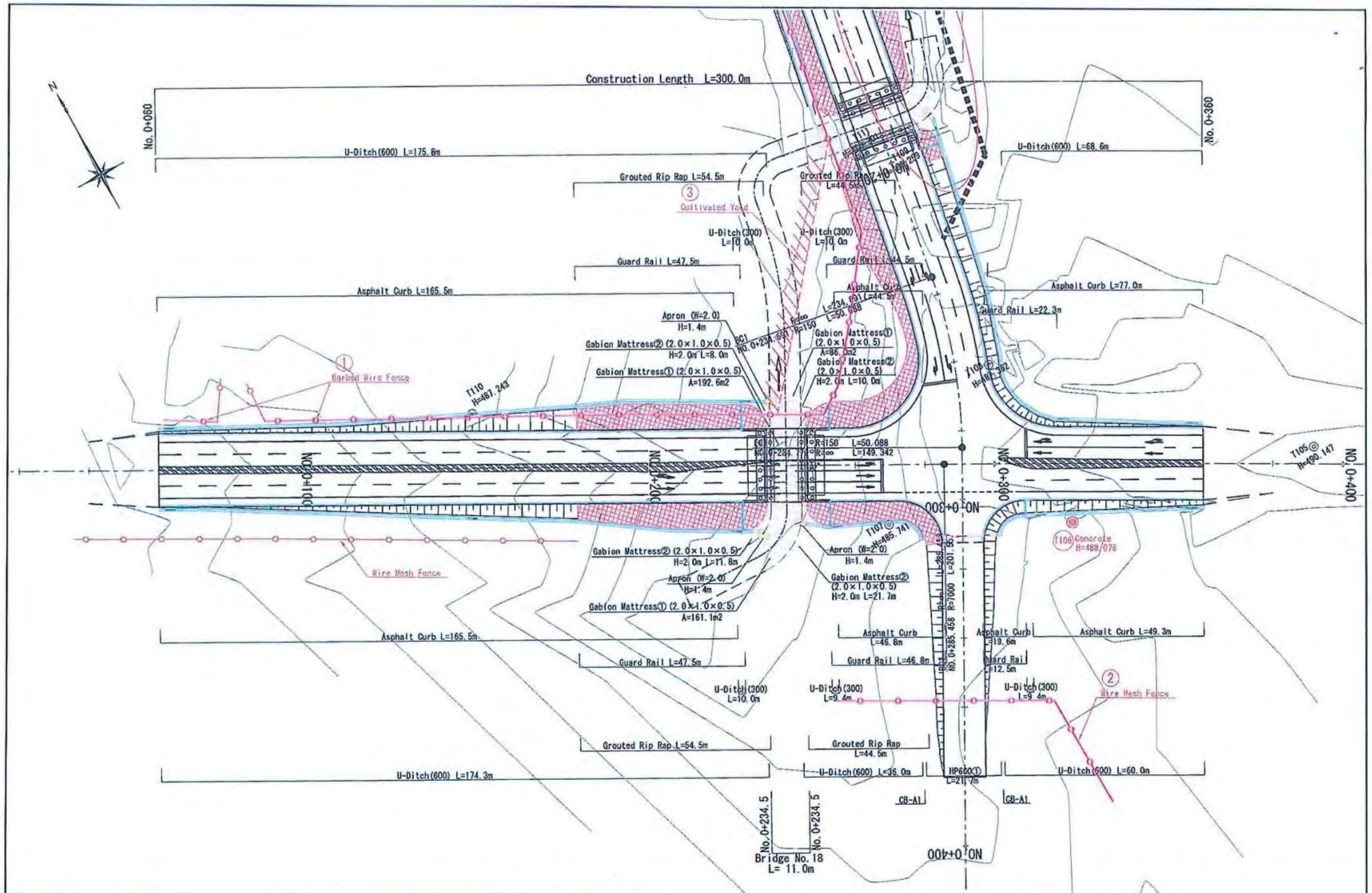
DATE	SHT. NO.
	CB-26

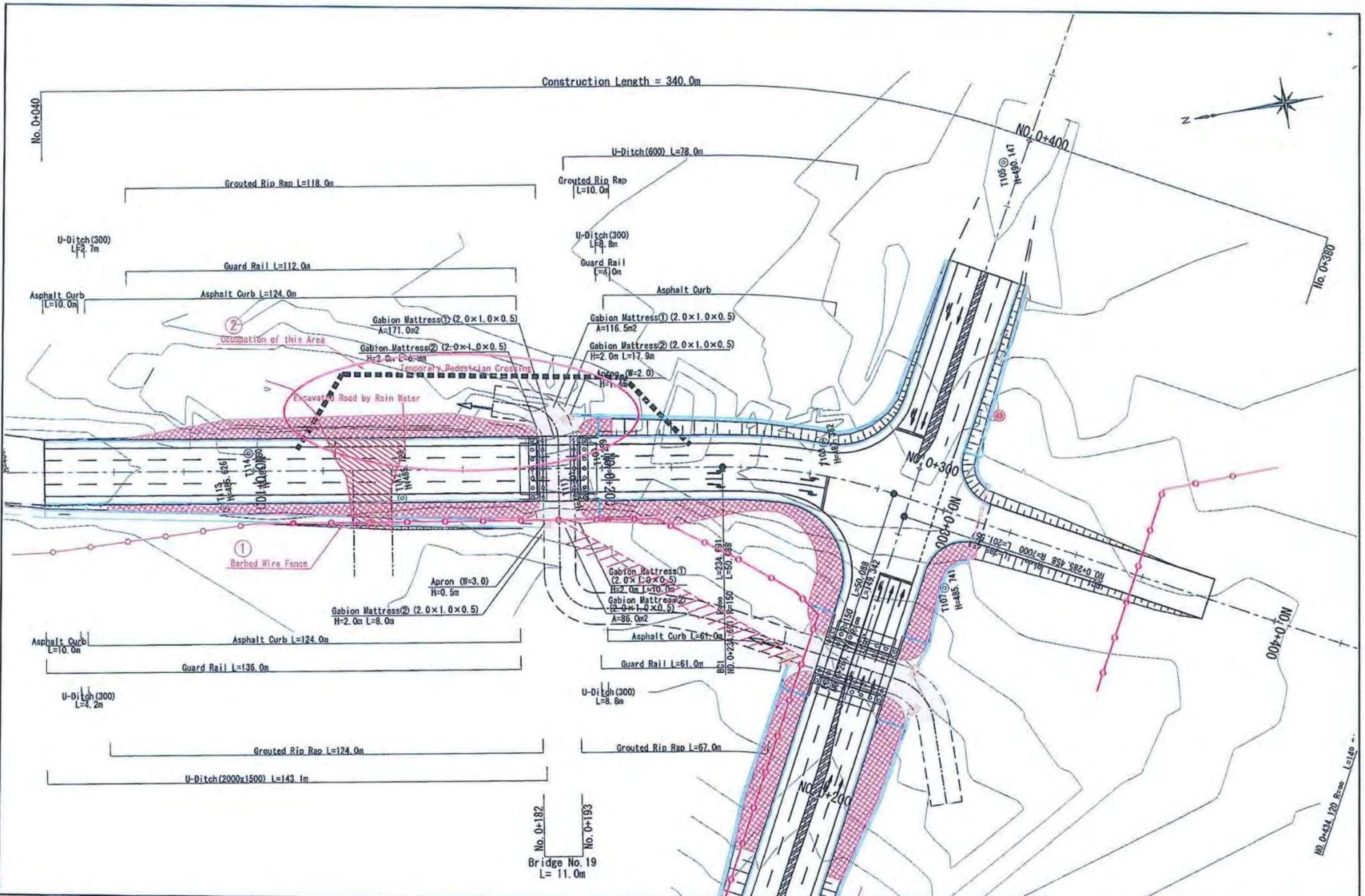


REPUBLIC OF SOUTH SUDAN	Approved by / Project Manager	THE PROJECT FOR CONSTRUCTION OF THE LOLOGO BYPASS AND BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY / CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed / Checked / Approved	TITLE: SITE DEVELOPMENT PLAN (BRIDGE NO.10)	SCALE 1:500 / DWG. NO. / DATE / SHT. NO. CB-37



REPUBLIC OF SOUTH SUDAN	Approved by Project Manager	THE PROJECT FOR CONSTRUCTION OF THE LOLOGO BYPASS AND BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed Checked Approved	TITLE: SITE DEVELOPMENT PLAN BRIDGE NO.18

SCALE	DWG. NO.
1:1,000	
DATE	SHT. NO.
	CB-48



REPUBLIC OF SOUTH SUDAN	Approved by Project Manager	THE PROJECT FOR CONSTRUCTION OF THE LOLOGO BYPASS AND BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed Checked Approved	TITLE : SITE DEVELOPMENT PLAN BRIDGE NO.19	SCALE 1:1,000 DATE	DWG. NO. SHT. NO. CB - 49

資料 4-5　Technical Notes　2015 年 11 月

Ministry of Transport, Roads and Bridges
Republic of South Sudan

Ministry of Physical Infrastructure, Central Equatoria
Republic of South Sudan

PREPARATORY SURVEY
ON

THE PROJECT FOR CONSTRUCTION
OF
THE BRIDGES IN JUBA CITY
IN THE REPUBLIC OF SOUTH SUDAN

TECHNICAL NOTES

NOVEMBER 2015

JAPAN INTERNATIONAL COOPERATION AGENCY

CTI ENGINEERING INTERNATIONAL CO., LTD.

Preparatory Survey on the Project for Construction of the Bridges in Juba City in the Republic of South Sudan

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Juba City, Republic of South Sudan
November, 2015

for 平島博之

YUZO, MIZOTA
Chief Consultant
JICA Survey Team

JOHN BULLEN
Director General
Ministry of Physical Infrastructure
Central Equatoria State

04 NOV 2015

GABRIEL MAKUR
Undersecretary
Ministry of Transport,
Roads and Bridges
Republic of South Sudan

04.11.15

OTIM BONG MIKE
Acting Director General
Ministry of Transport,
Roads and Bridges
Republic of South Sudan
(Witness)

1. Priority of Bridges

The priority of six (6) bridges to be constructed is divided into following two (2) groups due to the traffic volume and city activity convenience :

Priority of Bridge Construction	Bridge Number	Remarks
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Second Priority	Bridge No.18, Bridge No.19	Low traffic volume along/near outer ring road

First Priority Bridges are targeted to be constructed under the Project.
Second Priority Bridges are not included under the Project.

2. Road Design

(1) Pavement Design

Concrete pavement is adopted for the pavement of bridges and approach roads in the view of economic aspects because of no availability to utilize the asphalt plant under the Project without Lologo Bypass.

(2) Road Drainage Design (Refer to Annex-1)

The design of road drainage facilities of No.1 Bridge (Right side from 0+60m to 1+00m) shall be changed its location and configuration of ditch due to new house constructed and its location is out of Right of Way.
And its configuration shall be changed from Masonry ditch (3300x2000x1300) to U-1000 ditch and shall be located along the outside of the retaining wall and gravity wall similar to other ditch.
Masonry ditch length remains only 5m length near the River.

3. Bridge Designs

(1) Bridge Pavement

Bridge shall be designed with the concrete pavement and concrete pavement shall be incorporated in the deck slab of the bridge.

(2) Joint

Expansion Joint type will be applied rubber type joint, because of excellence for durability, maintenance, and economic efficiency as actual experience.

(3) Bridge accessories

In future plan, there will be no bridge accessories such as water pipe lines.

4. Undertakings by Republic of South Sudan

The major tasks to be undertaken by the Republic of South Sudan(RSS) has been confirmed in the technical notes dated on 28, June 2013. The following issues to be undertaken by Republic of South Sudan were additionally confirmed in this technical notes after conducting site survey from 17th of September, 2015 to 10th of November, 2015.

(1) Pavement of Approach Roads to the Bridges

Pavement of Approach Roads to the Bridges is basically constructed by the RSS.

(2) Secure of the Land and Relocation required

The RSS sides shall secure the land and the relocation of the utilities required for the bridge construction under the Project.

① The Table-1 shows Requirements of the RSS for the Construction of the Bridges in Juba City to be taken. And the drawing of the locations for the obstructions are shown in Annex-2.

② The fund, 1,500,000 SSP, for the Requirements of the RSS already has been allocated by MTRB.

③ The problem of the occupation by Anseba Hotel at the No.7 Bridge Right of Way area was solved among MTRB, MOPI and Anseba Hotel with the agreement shown in Annex-3.

④ The RSS should reserve the Right of Way for Bridges Construction as shown in Annex-4.

Table-1 Requirements of the RSS for the Construction of the Bridges in Juba City

Bridge Name	Items	Removal of Obstruction (Land, Fence, Masonry Wall, e.t.c.)	Quantity of Obstruction
No.1	①	Removal of existing Bamboo Fence	26m
	②	Removal of existing Barbed Wire Fence	16m
	③	Removal of existing Scrapped Cars	6 cars
	④	Removal of existing Electric Wire and Pole	110m
	⑤	Removal of existing Bill Board 1.3mx2.4m	1 unit
	⑤	Removal of existing Bamboo Fence	15m

No.4	①	Removal of part of existing Restaurant *	5m2
	②	Removal of existing Electric Wire and Pole	120m
No.7	①	Removal of Anseba Hotel Area from Right-of-Way	done
	②	Removal of existing Masonry Wall	16m
	③	Removal of existing Bamboo Fence	40m
	④	Removal of existing Sign Board 3mx2m	1 unit
No.10	①	Removal of Brick and Masonry Wall	7m
	②	Demolition of existing Concrete Box (1.9mx4.8m)	9.2m2
	③	Removal of existing Bamboo Fence	16m

*This item should be removed under construction period due to the future bridge structure design change.

(3)Size and Location of Construction Yard

The construction requires the temporary construction yard of 2ha (200mx100m).

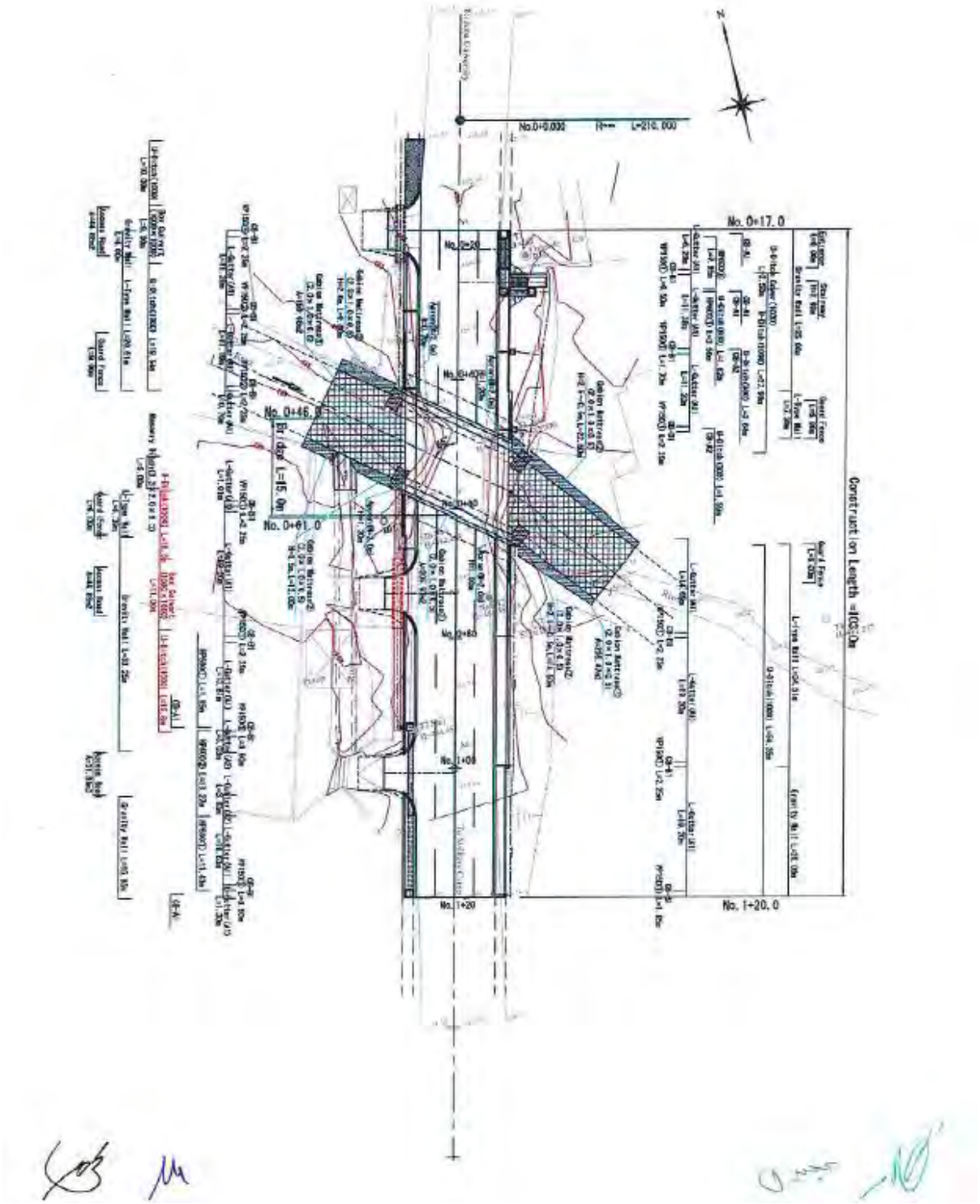
The possible construction yard location is shown in Annex-5.

(4)Borrow Pit, Quarry Sites and Disposal Sites

The possible location of borrow pit and disposal sites are shown in Annex-5.

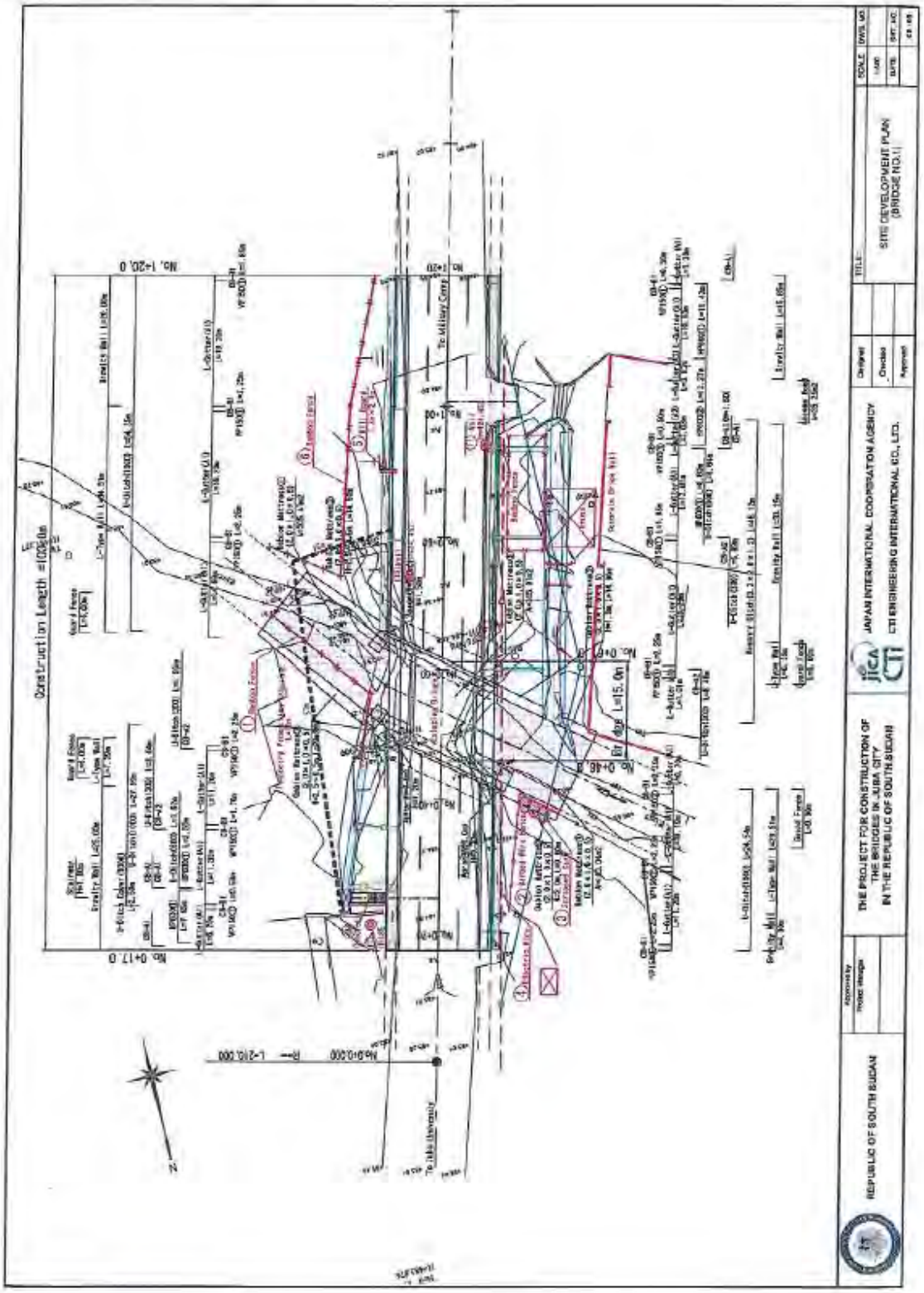
ANNEX-1

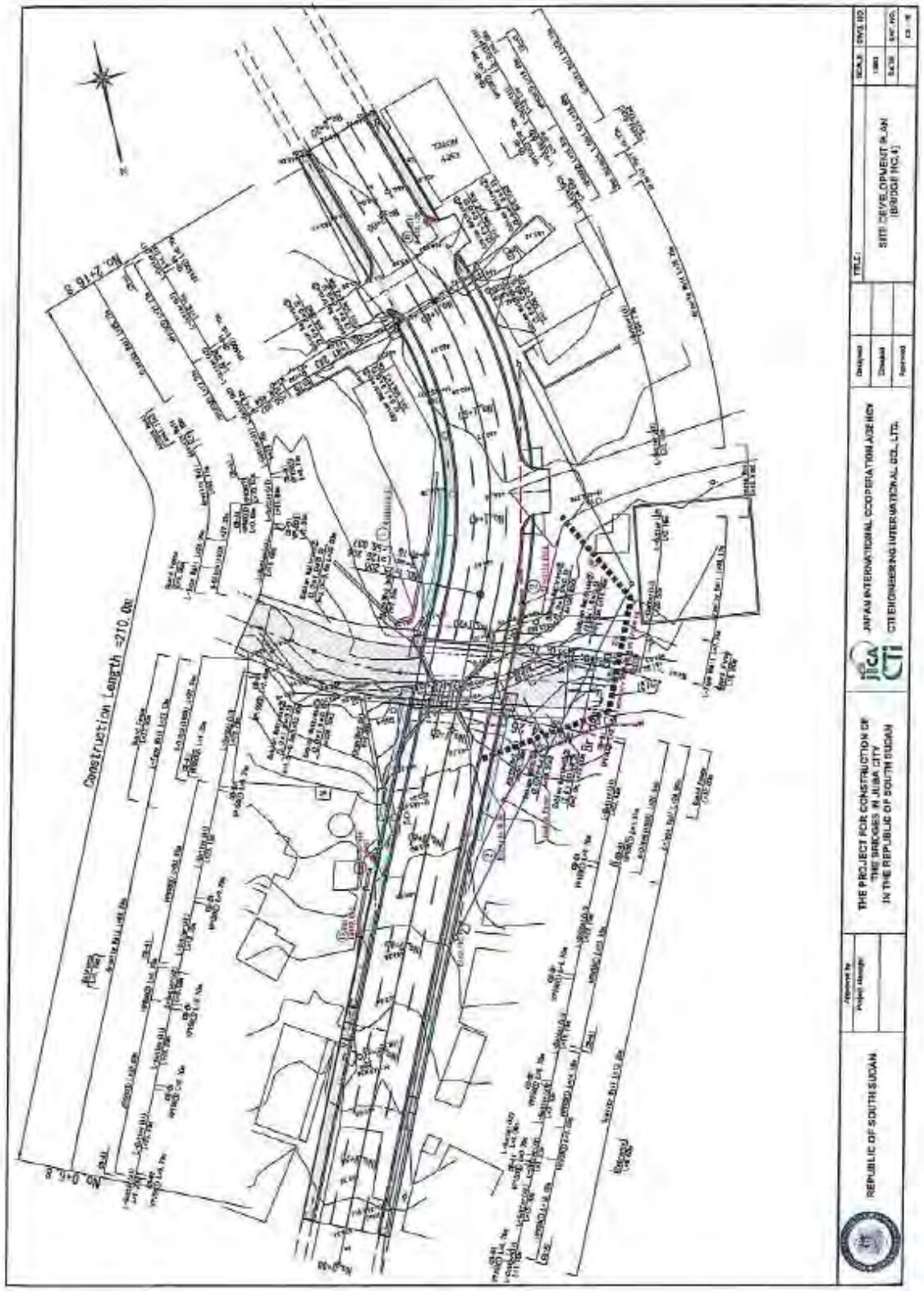
Road Drainage Design Change

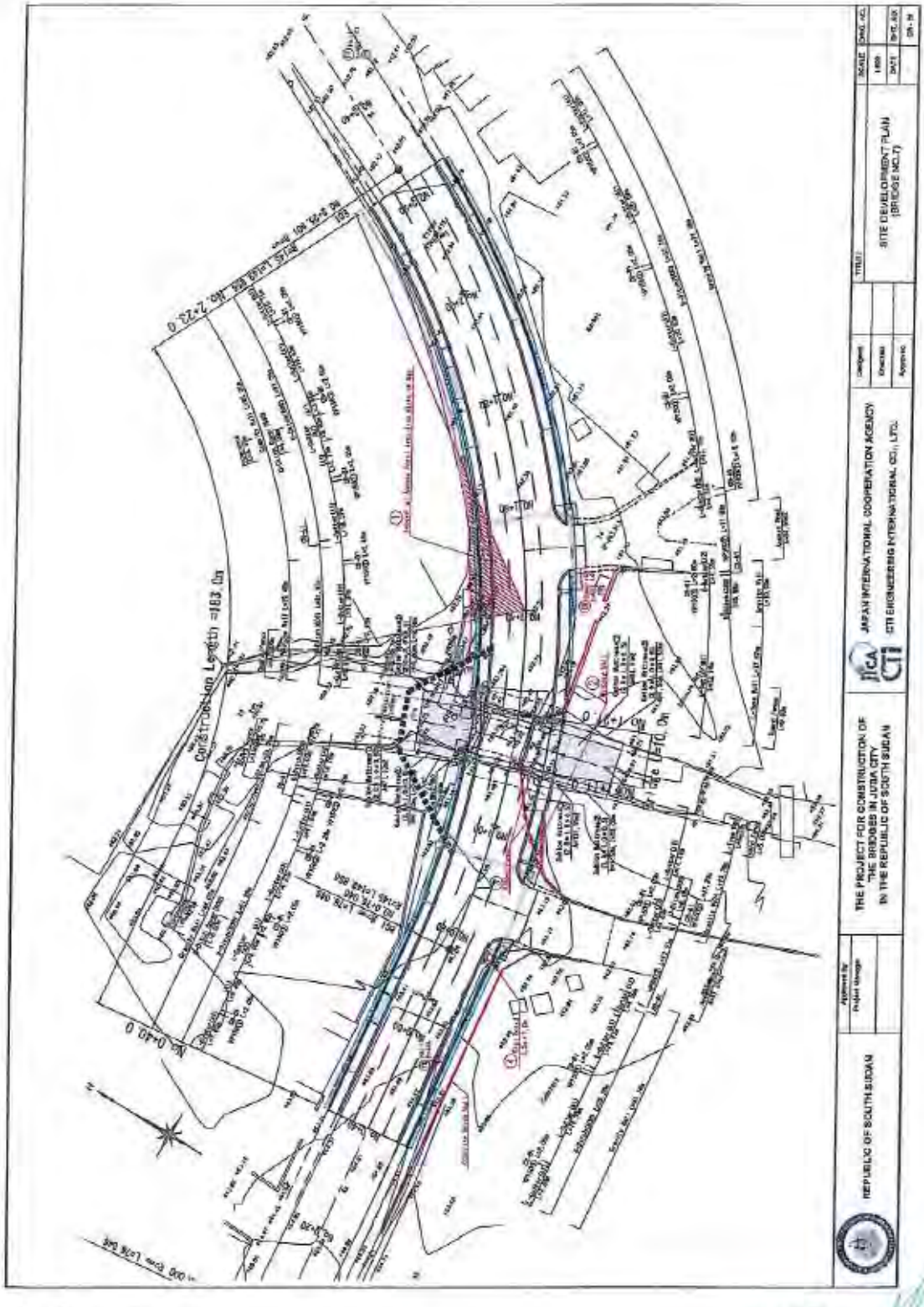

No.0+0.000
L=210.000
No. 0+17.0
No. 0+46.0
Bridge L=15.0m
No. 0+61.0
No. 1+20.0
Construction Length =103.0m

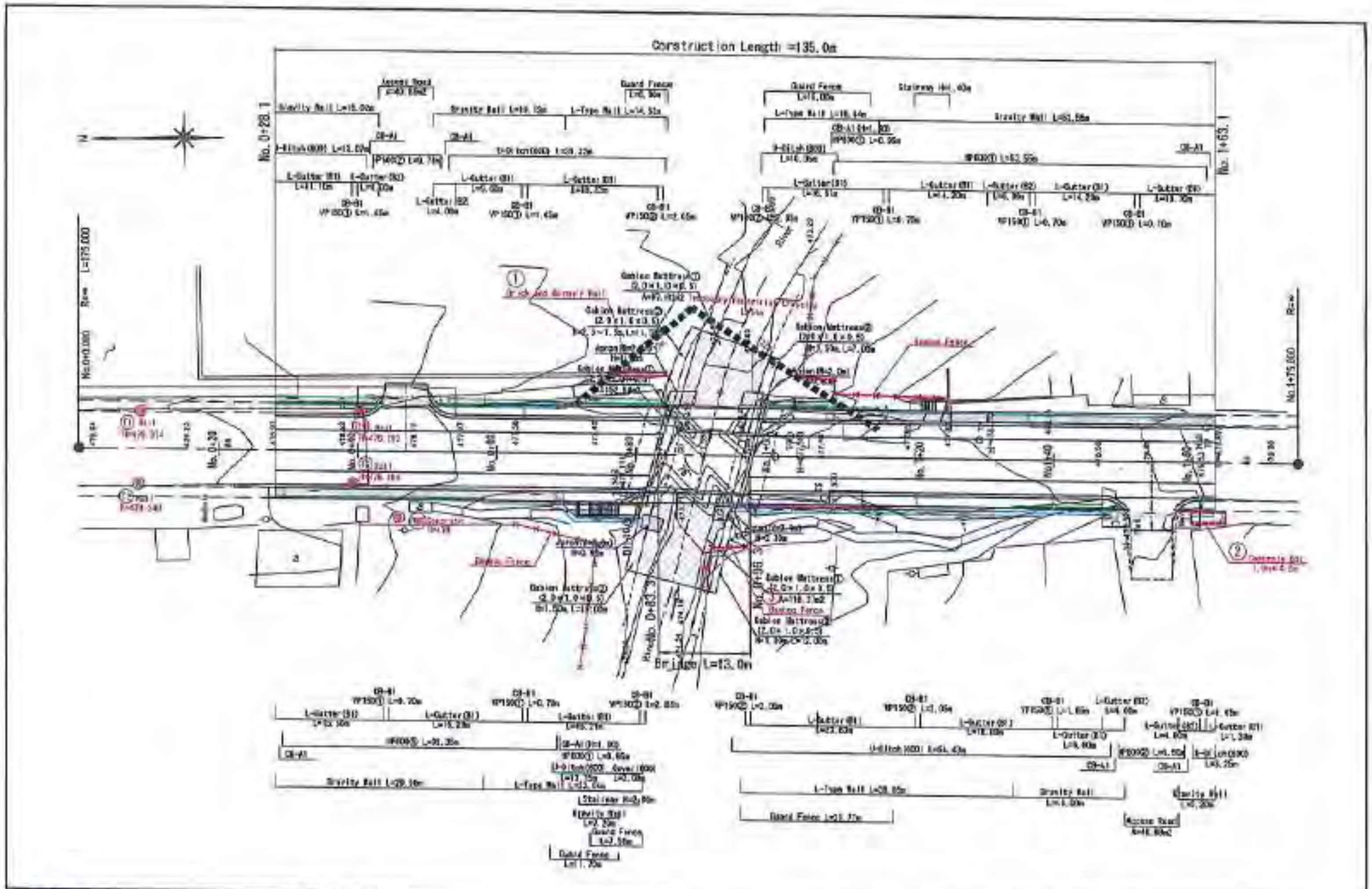
ANNEX- 2

Drawings for Removal of the Obstructions


REPUBLIC OF SOUTH SUDAN
THE PROJECT FOR CONSTRUCTION OF THE BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN
JAPAN INTERNATIONAL COOPERATION AGENCY
CTI ENGINEERING INTERNATIONAL CO., LTD.
SITE DEVELOPMENT PLAN (BRIDGE NO.1)
Construction Length =1005.0m
To Military Camp
To Juba University


Construction Length =210.0m
THE PROJECT FOR CONSTRUCTION OF THE BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN
REPUBLIC OF SOUTH SUDAN
JAPAN INTERNATIONAL COOPERATION AGENCY
CTI ENGINEERING INTERNATIONAL CO., LTD.
SITE DEVELOPMENT PLAN (BRIDGE NO.4)


REPUBLIC OF SOUTH SUDAN
THE PROJECT FOR CONSTRUCTION OF THE BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN
JAPAN INTERNATIONAL COOPERATION AGENCY
CTI ENGINEERING INTERNATIONAL CO., LTD.
SITE DEVELOPMENT PLAN (BRIDGE NO.7)
Construction Length =183.0m



REPUBLIC OF SOUTH SUDAN

Approved by
Project Manager

THE PROJECT FOR CONSTRUCTION OF THE BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
CTI
CTI ENGINEERING INTERNATIONAL CO., LTD.

Designed
Checked
Approved

TITLE:
SITE DEVELOPMENT PLAN (BRIDGE NO.10)

SCALE
DWG. NO.
DATE
SHT. NO.

ANNEX- 3

Construction Condition of Anseba Hotel

Minutes of Meeting

Reference : The Project for Construction of Bridges in Juba City in the Republic of South Sudan

Subject : Construction Condition of Anseba Hotel Near to Salakana Bridge (Bridge No.7) Approach Road

Based on the previous field investigation and discussions held among parties such as Ministry of Transport, Roads, and Bridges (MTRB) of Republic of South Sudan, Ministry of Physical Infrastructure (MOPI) of Central Equatoria State Government and Hotel representative of Anseba Company LTD, the Parties have agreed that the land and facilities of Anseba Company Ltd fall within the Right-of-Way of the approach road to Salakana Bridge (Bridge No. 7), therefore, Anseba Company Ltd should relocate them outside of the Right-of-Way of Salakana Bridge (Bridge No.7) as shown in the enclosed layout drawings of Salakana Bridge (Bridge No.7) and its approach road. The attached documents include the following information:

a. **Approach road layout plan of Salakana bridge (Attachment-1)**
b. **Survey coordinates of Right-of-Way for approach road of Salakana bridge (Attachment-1)**
c. **Possible hotel land area near to Salakana bridge and approach road (Attachment-1)**
d. **Salakana bridge layout plan (Attachment-1)**
e. **Location of Salakana bridge in Juba City (Attachment-2)**

For and on behalf of the MTRB

SIGNED BY:
Eng. Otim Rang Mike
Acting Director for Roads and Bridges
Ministry of Transport, Roads and Bridges
Republic of South Sudan

For and on behalf of the Anseba Hotel

SIGNED BY:
Mr. Merhawi Mesfun
Managing Director
Anseba Company Limited

For and on behalf of the MOPI:

SIGNED BY:
Mr. Roman Marghani
Acting Director General, Roads and Bridges
Ministry of Physical Infrastructure
Central Equatria State Government
Republic of South Sudan

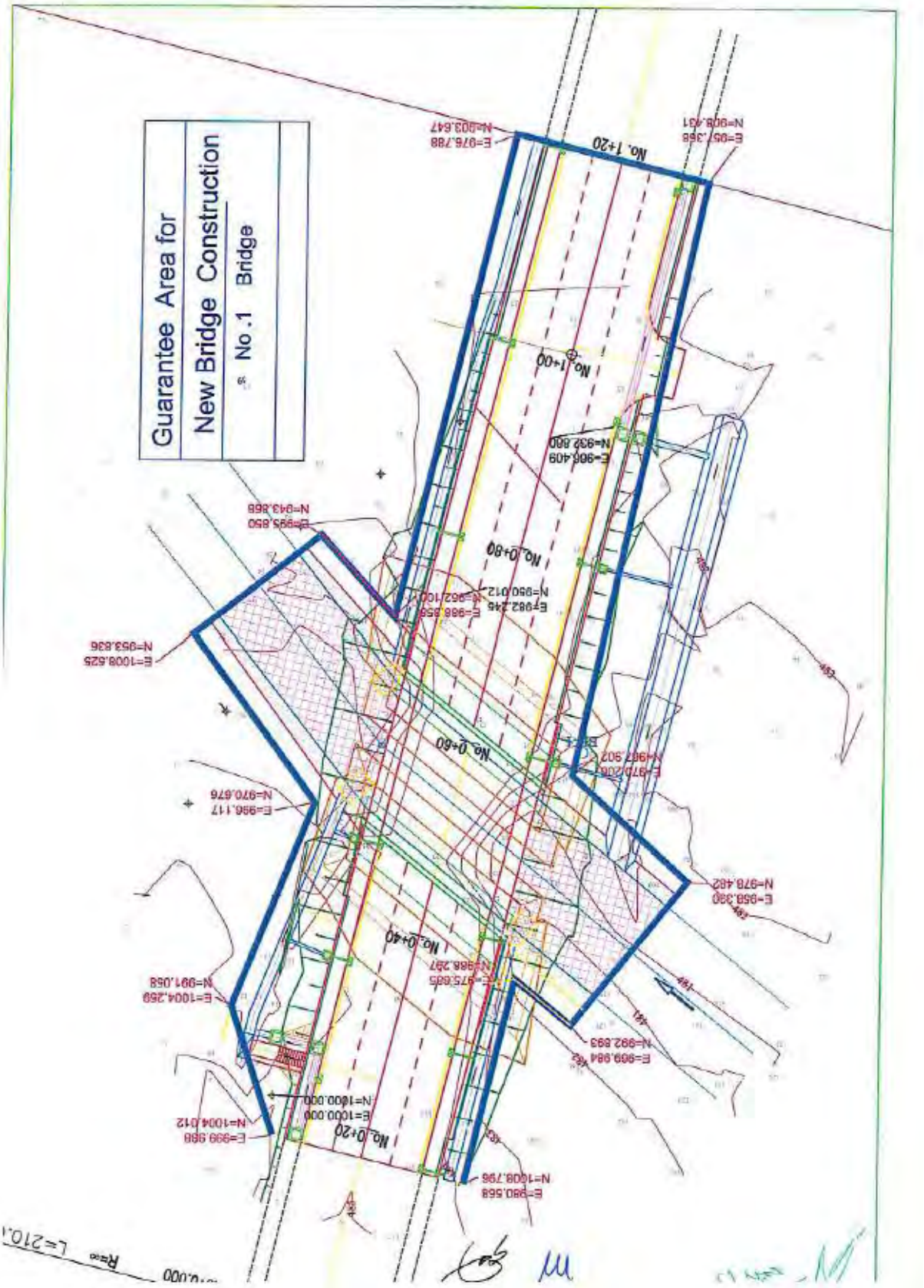
C
D
G
B
H
F
E
A
Possible hotel land area near to Salakana bridge and approach road
Attachment-1
Project Name
The Project for construction of the Bridgs in Juba City in the Republic of South Sudan
Title
Layout Drawing for Bridge NO.7 (Salakana)

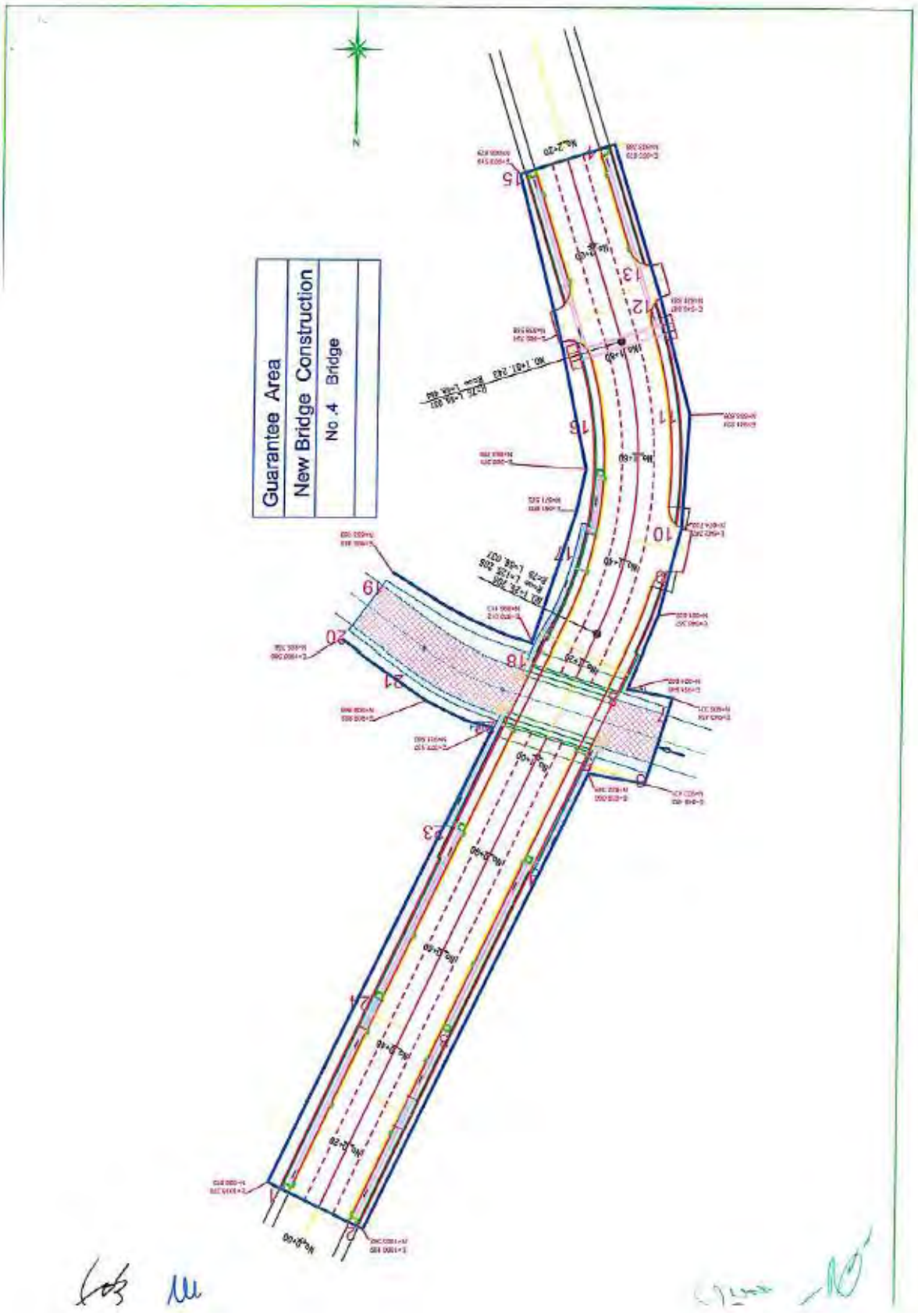
Attachment-2

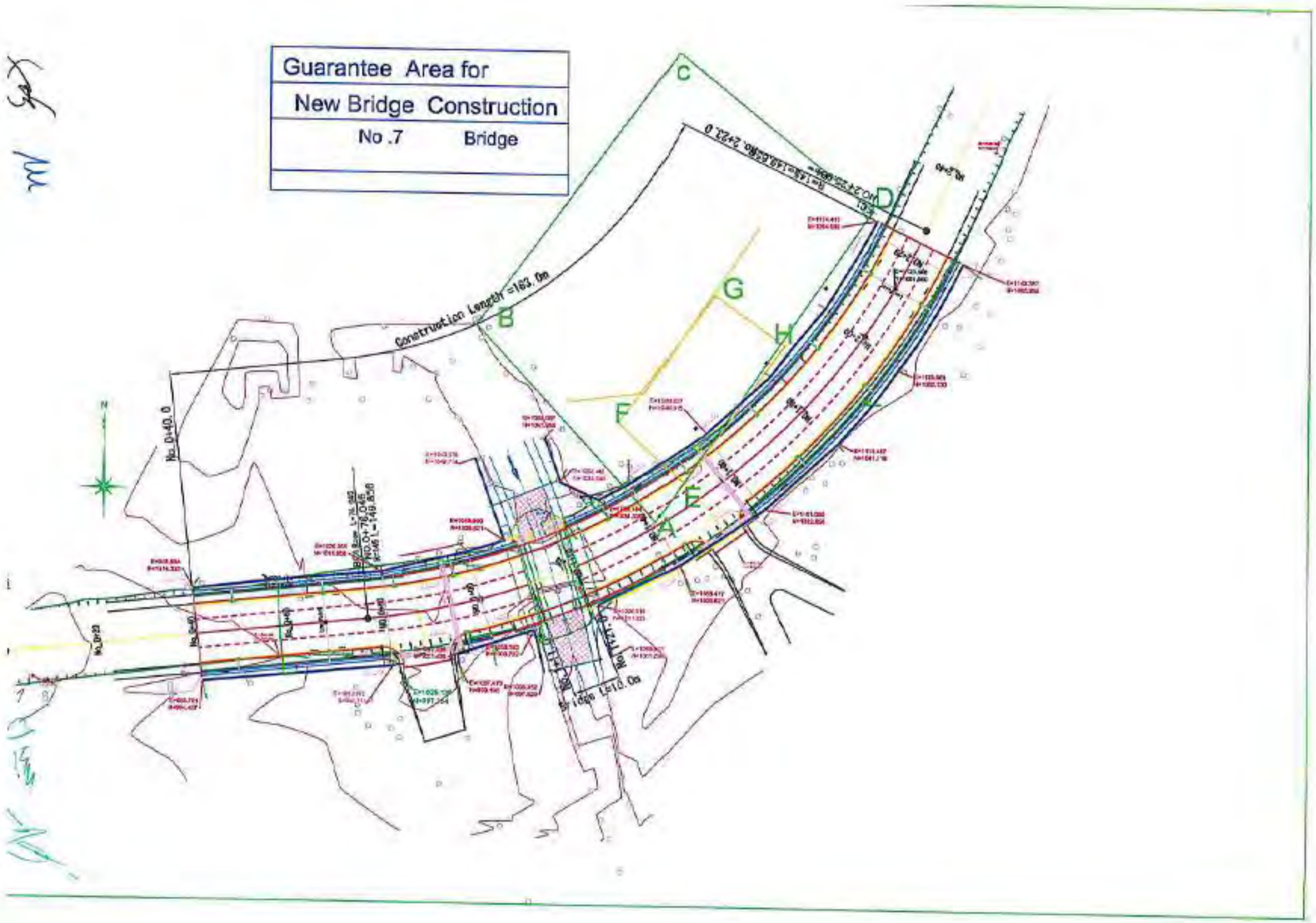
LOCATION MAP

ANNEX- 4

Guarantee Area for New Bridge Construction


Guarantee Area for
New Bridge Construction
No.1 Bridge


Guarantee Area
New Bridge Construction
No.4 Bridge

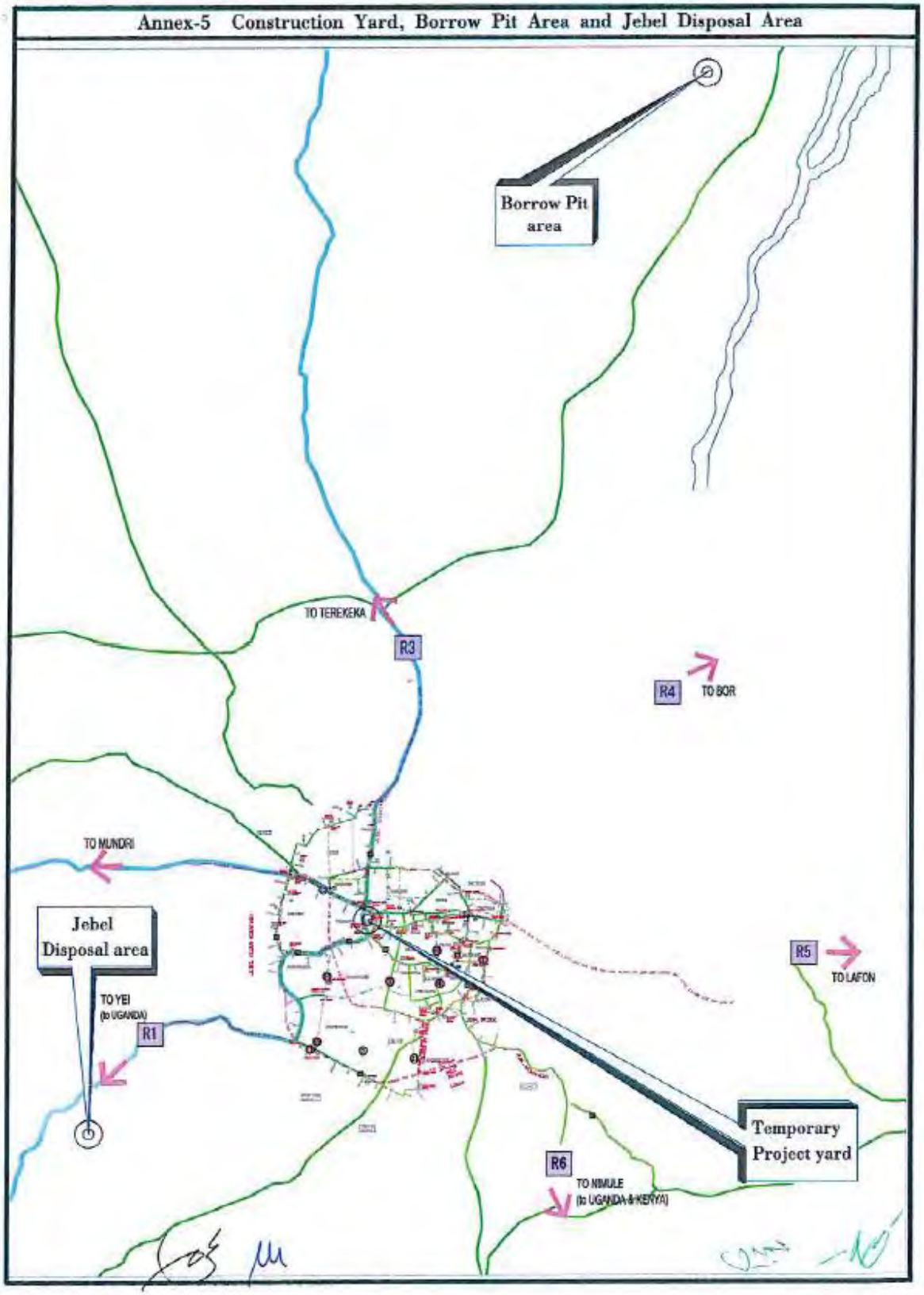


Guarantee Area for
New Bridge Construction
No .7 Bridge
Construction Length =163.0m
C
B
D
G
H
F
E
A
No.0+40.0

Guarantee Area
New Bridge Construction
No .10 Bridge
Construction Length =136.0m
No. 0+28.1
No. 1+63.1
No.0+0.000 R=∞ L=175.000
No.1+75.000 R=∞
No. 0+83.3
No. 0+96.3
Bridge L=13.0m

Annex-5

Construction Yard, Borrow Pit Area and Jebel Disposal Area


Annex-5 Construction Yard, Borrow Pit Area and Jebel Disposal Area
Borrow Pit area
TO TEREKEKA
R3
R4
TO BOR
TO MUNDRI
Jebel Disposal area
TO YEI (to UGANDA)
R1
R5
TO LAFON
Temporary Project yard
R6
TO NIMULE (to UGANDA & KENYA)

資料 4-6　討議議事録（M/D）　2016 年 3 月

資料－1　議事録（M／D）

MINUTES OF DISCUSSIONS
ON
THE PREPARATORY SURVEY
FOR
THE PROJECT FOR CONSTRUCTION OF BRIDGES IN JUBA
IN
THE REPUBLIC OF SOUTH SUDAN
(Explanation of Draft Outline Design Report)

On the basis of the preparatory survey started in March 2013, the Japan International Cooperation Agency (hereinafter referred to as "JICA") prepared a Draft Outline Design Report (hereinafter referred to as "the Report") on the Project for Construction of Bridges in Juba (hereinafter referred to as "the Project").

The Preparatory Survey Team, headed by Mr. Hidetaka Sakabe, Deputy Director, Team 1, Transport and ICT Group, Infrastructure and Peacebuilding Department, JICA, explained to and consulted with the concerned officials of the Government of the Republic of South Sudan (hereinafter referred to as "RSS") on the contents of the Report. As a result of discussions, both sides confirmed the main items described in the attached sheets.

Juba, March 16, 2016

Hidetaka Sakabe
Leader
Preparatory Survey Team
Japan International Cooperation Agency

Gabriel Makur
Undersecretary
Ministry of Transport, Roads and Bridges
Republic of South Sudan

Otim Bong Mike
Acting Director General
Ministry of Transport, Roads and Bridges
Republic of South Sudan
(Witness)

添 1-1

ATTACHMENT

1. Components of the Draft Outline Design Report

1.1. The Ministry of Transport, Roads and Bridges (hereinafter referred to as MTRB) agreed and accepted in principle the contents of the Report explained by the Team. Main components of the Project consist of the following.

a) Bridge No.1 (L=15.0m, 4 lanes), Approach Road (L=88.0m, 4 lanes)
b) Bridge No.4 (L=17.3m, 4 lanes), Approach Road (L=198.5m, 4 lanes)
c) Bridge No.7 (L=10.0m, 4 lanes), Approach Road (L=173.0m, 4 lanes)
d) Bridge No.10 (L=13.0m, 4 lanes), Approach Road (L=122.0m, 4 lanes)

1.2. The Team requested and the South Sudanese side agreed to confirm the components of the Project and submit comments if any for the Report by 15 April 2016.

2. Cost Estimation for the Project

2.1. The Japanese side explained to the South Sudanese side the rough estimate of the Project Cost described in Annex-1; however, the final Project Cost described in the Exchange of Note (hereinafter referred to as "E/N") would be appraised by the Government of Japan (hereinafter referred to as "GOJ").

2.2. Both Sides further confirmed that the Project Cost in Annex-1, and details of the construction works in the Report should never be duplicated and/or disclosed to any third parties until all the contracts for the Project are concluded.

3. Project Implementation Schedule

The Team explained to the South Sudanese side that the expected implementation schedule is as attached in Annex-2.

4. Indicators for Expected Outcomes

Both sides agreed that key indicators for expected outcomes are as follows. The South Sudanese side has responsibility to monitor the progress of the indicators.

[Quantitative Effect]

Indicator: Traffic Volume (PCU/day)	Base year 2013	Target year 2020 (Project completion)
Bridge No.1	11,600	24,220
Bridge No.4	5,480	9,090
Bridge No.7	6,450	13,290
Bridge No.10	10,450	16,400

[Qualitative Effect]

Improved punctuality of passenger and freight traffic

Enhanced convenience of the road network

Improved safety for pedestrians and vehicles

5. Undertaking by South Sudanese Side

Both sides confirmed the undertakings described in Annex-3. The South Sudanese side assured that the necessary measures and coordination including allocation of the necessary budget are taken. It was understood that the costs are indicative, i.e. at Outline Design level. More accurate costs will be calculated at the Detailed Design stage. The Contents of Annex-3 will be updated as the Detailed Design progresses, and will finally be used in the contract document.

3-1.The construction yard will be prepared by MTRB as in Annex-4.

3-2.The Team recommended that the South Sudanese side explain to the residents the Project (necessity and significance, construction period, sites, impact etc.), so that consensus support can be obtained from them for the smooth operation of the Project.

6. Monitoring during the Implementation

The Project will be monitored and reportedquarterly by MTRB and using the Project Monitoring Report (PMR) attached in Annex-5.

7. Ex-Post Evaluation

JICA will conduct ex-post evaluation three (3) years after the project completionwith respect to five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact, Sustainability) of the Project. Result of the evaluation will be publicized. TheSouth Sudanese side is required to provide necessary support for them.

8. Schedule of the Study

JICA will complete the Final Report of the Preparatory Survey in accordance with the confirmed items and send it to the South Sudanese side around May 2016.

9. Environmental and Social Considerations

10-1 Environmental Checklist

The environmental and social considerations including major impacts and mitigation measures for the Project are summarized in the Environmental Checklist attached as Annex-6. Both sides confirmed that in case of major modification of the content of the Environmental Checklist, the South Sudanese side shall submit the modified version to JICA in a timely manner.

12-2 Environmental Monitoring Plan

Both sides agreed that the South Sudanese side will submit results of environmental monitoring to JICA by using the monitoring form attached as Annex-7.

10. Other Relevant Issues

13-1. Operation and Maintenance of the Facilities

The team explained the importance of operation and maintenance of the facilities constructed by the Project considering that proper asset management impacts greatly on life-span of the facilities and its maintenance cost. Ministry of Physical Infrastructure, Central Equatoria Stateshall secure enough staff and budgets necessary for appropriate operation and maintenance of the facilities.

13-2. Disclosure of Information

Both sides confirmed that the study results excluding the Project cost will be disclosed to the public after completion of the Preparatory Survey. All the study results including the project cost will be disclosed to the public after all the contracts for the Project are concluded.

13-3. Creation of the South Sudan Roads Authority (SSRA)

The South Sudanese side explained that the Bill for the creation of South Sudan Roads Authority (SSRA) was enacted in January 2011, but the authority is not fully functional. The MTRB assured that it continues to assume its responsibilities as the implementing agency upto the project completion. After the completion MoPI shall be in charge of maintenance of the four bridges.

Annex-1 Project Cost Estimation
Annex-2 Project Implementation Schedule
Annex-3 Major Undertakings to be taken by Each Government
Annex-4 Construction yard
Annex-5 Project Monitoring Report
Annex-6 Environmental Checklist
Annex-7Environmental Monitoring Form

Annex-1: Project Cost Estimation

CONFIDENTIAL

(1) Cost Borne by the Government of Japan

Total: 2,720 million JPY
- Civil Work: 2,216 million JPY
- Detailed Design and Construction Supervisory Service: 256 million JPY
- Contingency: 248 million JPY

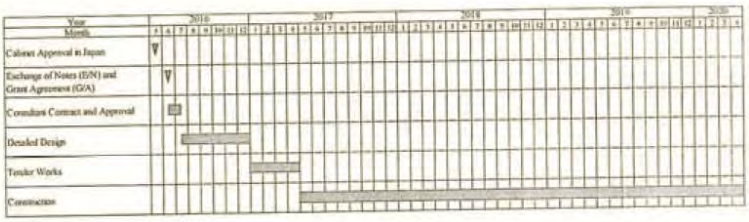
(2) Cost Borne by the Government of South Sudan

- Removal of obstructions, bank charges etc.: 12 million JPY

(3) Conditions of Cost Estimation

- Estimated timing: August 2015
- Exchange rates: 1.00 USD = 122.20 JPY
  1.00 USD = 2.95 SSP
- Others: The project is implemented in accordance with the system of Japan's Grant Aid. The above cost estimation does not assure the ceiling cost on the E/N and shall be reviewed by GOJ before signing of the E/N between the two Governments.

Annex-2: Project Implementation Schedule



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Annex-3 Major Undertakings to be taken by Each Government

Major Undertakings to be taken by Recipient Government

1. Before the Tender

NO	Items	Deadline	In charge	Cost	Ref.
1	To approve ESIA	within 1 month after G/A	Ministry of Environment	-	approved in Oct 2013
2	To implement ESIA	before start of the construction	MTRB	-	ESIA submitted to MOE in Aug 2013
3	To open Bank Account (Banking Arrangement (B/A))	within 1 month after G/A	MTRB	-	
4	To secure lands 1) temporary construction yard and stock yard near the Project area 2) borrow pit and disposal site near the Project area	before notice of the tender document	MTRB	-	
5	To obtain the planning, zoning, building permit when needed.	before notice of the tender document	MTRB	-	
6	To clear, level and reclaim when needed	before notice of the tender document	MTRB	-	

2. During the Project Implementation

NO	Items	Deadline	In charge	Cost	Ref.
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A				
	1) Advising commission of B/A: 0.1 % of total project cost)	within 1 month after the singing of the contract	MTRB	US$20,200	
	2) Payment commission for B/A: (0.12% of every payment *15,000 Yen) x 5 times)	every payment	MTRB	US$24,900	
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country				
	1) Tax exemption and customs clearance of the products at the port of disembarkation	during the Project	MTRB	-	
	2) Internal transportation from the port of disembarkation to the project site	during the Project	N.A.	-	None
3	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work	during the Project	MTRB	-	
4	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the Products and/or the Services be exempted. Such customs duties, internal taxes and other fiscal levies mentioned above include VAT, commercial tax, income tax and corporate tax of Japanese nationals, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract	during the Project	MTRB	-	

5	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for constructionof the facilities as well as for the transportation and installation of the equipment	during the Project	MTRB	-	
6	Relocation of Utilities(Installation of water pipe, electric cable and communication cable)		MTRB	US$6,000	Removal of Electric cable and post
7	Removal of obstruction in the construction site		MTRB	US$15,000	Removal of fence , well, etc
8	To submit environmental monitoring report to JICA South Sudan Office	during the Project	MTRB	-	

3. After the Project

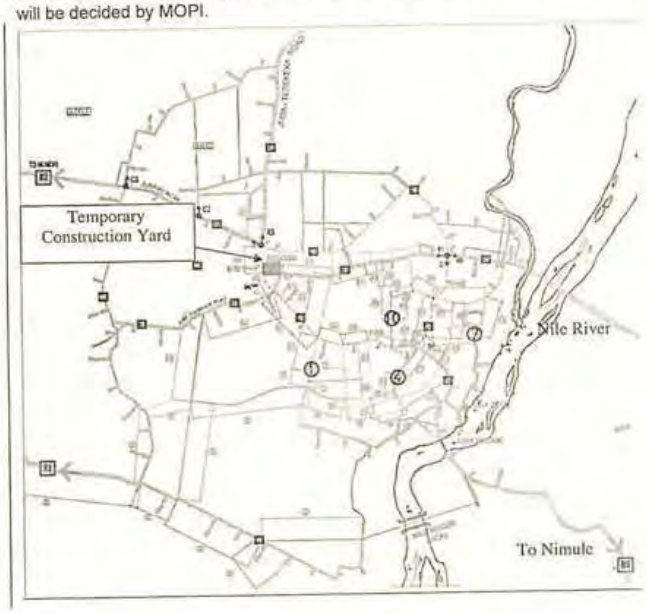
NO	Items	Deadline	In charge	Cost	Rel.
1	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure 3) Routine/Periodic inspection	After completion of the construction	MTRB	USD9,960 per year	

Costs to be covered by the Grant Aid

No	Items	Deadline	Cost Estimated (Million Japanese Yen)	
1	Civil Work		2,216	
2	To implement detailed design, tender support and construction supervision (Consultant)		256	
3	Contingencies		248	
	Total		2,720	

Annex-4: Construction Yard

Candidate of the temporary construction yard was proposed to MTRB by the Team. It will be decided by MOPI.



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Annex-5 Project Monitoring Report

Project Monitoring Report

on

Project Name

Grant Agreement No. XXXXXXX

20XX, Month

Organization Information

Authority (Signer of the G/A)	Person in Charge (Division) Contacts Address: Phone/FAX: Email:
Executing Agency	Person in Charge (Division) Contacts Address: Phone/FAX: Email:
Line Agency	Person in Charge (Division) Contacts Address: Phone/FAX: Email:

Outline of Grant Agreement:

Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of ():

Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:



1: Project Description

1-1 Project Objective

1-2 Necessity and Priority of the Project

- Consistency with development policy, sector plan, national/regional development plans and demand of target group and the recipient country.

1-3 Effectiveness and the indicators

- Effectiveness by the project

Quantitative Effect (Operation and Effect indicators)		
Indicators	Original (Yr)	Target (Yr)
Qualitative Effect		

2: Project Implementation

2-1 Project Scope

Table 2-1-1a: Comparison of Original and Actual Location

Location	**Original:** *(M/D)* Attachment(s):Map	**Actual:** *(PMR)* Attachment(s):Map

Table 2-1-1b: Comparison of Original and Actual Scope

Items	Original	Actual
(M/D)	*(M/D)*	*(PMR)*

'Soft component' shall be included in 'Items'.		Please state not only the most updated schedule but also other past revisions chronologically. All change of design shall be recorded regardless of its degree.

(Sample)Table 2-1-1b: Comparison of Original and Actual Scope

Items	Original	Actual
1. Bridges (No.1, 4, 7, 10) 2. Approach Road		

2-1-2 Reason(s) for the modification if there have been any.

(PMR)

2-2 Implementation Schedule

2-2-1 Implementation Schedule

Table 2-2-1: Comparison of Original and Actual Schedule

Items	Original		Actual
	DOD	G/A	
[M/D] 'Soft component' shall be stated in the column of 'Items'. Project Completion Date*	*(M/D)*		*(PMR)* As of (Date of Revision) Please state not only the most updated schedule but also other past revisions chronologically.

*Project Completion was defined as at the time of G/A.

(Sample)Table 2-2-1: Comparison of Original and Actual Schedule

Items	Original		Actual
	DOD	G/A	
Cabinet Approval			

E/N G/A Detailed Design Tender Notice Tender (Lot1) Construction Period (Lot2) Installation of Equipment Project Completion Date Defect Liability Period			

*Project Completion was defined as Check-out of Construction work at the time of G/A.

2-2-2 Reasons for any changes of the schedule, and their effects on the project.

2-3 Undertakings by each Government

2-3-1 Major Undertakings

See Attachment *.

2-3-2 Activities

See Attachment *.

2-3-3 Report on RD

See Attachment *.

2-4 Project Cost

2-4-1 Project Cost

Table 2-4-1a Comparison of Original and Actual Cost by the Government of Japan

(Confidential until the Tender)

Items			Cost (Million Yen)	
	Original	Actual	Original	Actual
Construction Facilities	'Soft component' shall be included in 'Items'.			Please state not only the most

(or Equipment)				updated schedule but also other past revisions chronologically.
Consulting Services	- Detailed design -Procurement Management -Construction Supervision			
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = Yen

Table 2-4-1b Comparison of Original and Actual Cost by the Government of XX

Items			Cost (Million USD)	
	Original	Actual	Original	Actual
				Please state not only the most updated schedule but also other past revisions chronologically.
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = (local currency)

(Sample)Table 2-4-1a Comparison of Original and Actual Cost by the Government of Japan

(Confidential until the Tender)

Items	Cost

			(Million Yen)	
	Original	Actual	Original[1,2]	Actual
Construction Facilities	1.			
Equipment				
Consulting Services				
Total				

Note: 1) Date of estimation: Month, Year
2) Exchange rate: 1 US Dollar = ** Yen

(Sample)Table 2-4-1b Comparison of Original and Actual Cost by the Government of RSS

Items			Cost (SSP)	
	Original	Actual	Original[1,2]	Actual
Total				

Note: 1) Date of estimation: Month, Year
2) Exchange rate: 1 US Dollar = ** Yen (local currency)

2-4-2 Reason(s) for the wide gap between the original and actual, if there have been any, the remedies you have taken, and their results.

(PMR)

2-5 Organizations for Implementation

2-5-1 Executing Agency:

- Organization's role, financial position, capacity, cost recovery etc.,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original: *(M/D)*
Actual, if changed: *(PMR)*

2-6 Environmental and Social Impacts

- The results of environmental monitoring as attached in Attachment * in accordance with Schedule * of the Grant Agreement.

- The results of social monitoring as attached in Attachment * in accordance with Schedule 4 of the Grant Agreement.

- Information on the disclosed results of environmental and social monitoring to local stakeholders, whenever applicable.

3: Operation and Maintenance (O&M)

3-1 O&M and Management

- Organization chart of O&M
- Operational and maintenance system (structure and the number ,qualification and skill of staff or other conditions necessary to maintain the outputs and benefits of the project soundly, such as manuals, facilities and equipment for maintenance, and spare part stocks etc.)

Original: *(M/D)*

Actual: *(PMR)*

3-2 **O&M Cost and Budget**

- The actual annual O&M cost for the duration of the project up to today, as well as the annual O&M budget.

Original: *(M/D)*

4: Precautions (Risk Management)

- Risks and issues, if any, which may affect the project implementation, outcome, sustainability and planned countermeasures to be adapted are below.

Original Issues and Countermeasure(s): *(M/D)*	
Potential Project Risks	Assessment
1.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
2.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:

	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
3.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
Actual issues and Countermeasure(s)	
(PMR)	

5: Evaluation at Project Completion and Monitoring Plan

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 **Lessons Learnt and Recommendations**

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 **Monitoring Planfor the Indicators for Post-Evaluation**

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

Attachment

1. Project Location Map
2. Undertakings to be taken by each Government
3. Monthly Report
4. Report on RD
5. Environmental Monitoring Form / Social Monitoring Form
6. Monitoring sheet on price of specified materials (Quarterly)
7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)
   (Final Report Only)

Annex-6 Environmental Checklist

Category	Environmental Item	Major Items to be checked	Yes: Y No: N	Confirmation of Environmental Consideration
1. Permit and Explanation	(1)EIA and Environmental Permit	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports have 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) Y (b) Y (c) Y (d) N	(a) ESIA reports have been already prepared in official process. (b)ESIA reports was approved in October 2013 by authorities of the host country's government, MOE. (c) ESIA reports been unconditionally approved . (d) Nothing.
	(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) N	(a) Stake Holder Meetings were held on 28th March, 2013, 5th April, 2013 and 27th June, 2013. (b) The stakeholders have no comment on proceeding the project.
	(3) Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) One alternative plan without the project was examined. Without the project, sufficient width of the bridge will not be obtained and the bridge will always be a bottleneck. Hence, heavy traffic jam is expected at each bridge. In addition, it is expected that there will be increase in traffic accidents/road crashes, and air pollution and serious soil erosion in rainy season.
2. Pollution Control	(1)Air Quality	(a) Is there observation that air pollution emitted from traveling vehicles affects ambient air quality? Does ambient air quality comply with the country's air quality standards? Are any mitigating measures taken? (b) Will project make air quality worsen in case the existing air quality exceeds the air quality standard? Are any mitigating measures taken?	(a) Y (b) N	(a) The urban network will be improved and traffic congestion will be relieved with less emission. (b) Current air quality which is the monitoring data at Juba downtown near Juba port is less than the reference values in Japanese air quality standards.
	(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	(a)Y (b) N (c) Y	(a) River banks near the bridges are to be protected from erosion. (b)There is no well near the project area. (c) Liquid waste from workers, camp is dumped at the official dumping site.

21

		quality standards? Is there a possibility that the effluents will cause areas not to comply with the country's ambient water quality standards?		
	(3)Waste	(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 generated from the workers camp 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 could become greater than standard during construction to the area facing the road. Monitoring will be implemented and noise prevention sheet 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) Nature of project site is city area
	(2)Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?	(a) N	(a) Nature of project site is city area. Ecosystem is far from this area.
	(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) The project does not requires land modification due to reconstruction of bridges and roads.
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?	(a) N	(a) No involuntary resettlement is expected
	(2)Living and livelihood	(a) Where 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 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 son shading and radio interference?	(a) N (b) Y (c) Y (d) Y (e) N (f) N	(a) Contents of the project is the bridge reconstruction and improvement of existing roads of both sides of bridge will be given within existing ROW which does not make significant environment change. (b) Special consideration and arrangement such as diversion is required for the pedestrian during the project as the number of pedestrian is large. (c) Provision of safety measures and prevention campaigns are planned. (d)In order to mitigate the traffic congestion, simultaneous construction of four bridges is planned to be avoided. (e) Due to the widening the road to 4 lanes and installation of sidewalks the movement of inhabitants will be more free. (f) There will be hardly radio interference during the project due to small size of bridge construction area which will be very limited and momentary.

	(3)Heritage	(a) Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a) N	(a) No cultural heritage exists within the project site.
	(4)Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) There will be negative impact on landscape which will however be limited and momentary during the project.
	(5)Ethnic Minorities and Indigenous People	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples?	(a) N	(a) There are no ethnic minorities and indigenous peoples within the project site.
5. Working Environment	(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 first prioritized policy in Environmental Monitoring Plan. (b) Health and safety for employees and residents are planned properly and secured. Safety Board for workers and pedestrians should be installed to keep safety. Provision of adequate sanitary facilities e.g. washroom and clean water should be installed. (c) Safety education, including how to use safety accessories and how to behave in emergency case, are to be implemented. (d) The safety control person should employed to supervise the safety control and safety guideline.
6. 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	The following appropriate countermeasures are expected to reduce impacts during construction: - Air pollution: to apply sprinkle water for dust prevention. - Water pollution: to treat a turbid water. - Waste: to dispose construction wastes at the specified disposal site. - Noise: to prevent noise using sound-proof construction equipment. Monthly meeting will be held to monitor the complains about construction. Based on the meeting, mitigation measures are taken when necessary. (a) Impact to ecosystem is negligible due to the bridge reconstruction and reconstruction of approach roads. (b) 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 the 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 Environmental Monitoring Plan. (c) Only one specialist is available but without any equipment. However proponent is going to request enough budget to fulfil the requirement of JICA Environmental and Social Considerations Guidelines as much as possible. (d) The contractor shall report the results of monitoring to Ministry of Environment and the Ministry will manage them. Every month the monitoring report is submitted to JICA.

Annex-7: Environmental Monitoring Form

1. Permit and Explanation

Monitoring Items	Actions to be taken
• ESIA and proposed monitoring plan need to be submitted: Approval from MOE • Monitoring shall be carried out according to approved plan	• Monitoring result: The result needs to be reported to MOE.

2. Pollution Control

Air Quality

Items	Sampled Value (Average)	Sampled Value (Maximum)	Standard Value	Referred Standard	Sampling Point, Time, Method
Sulphur Dioxides : SO_2			20-125 (daily)	WHO WHO Japan	• Nos. of Sampling: 1 point per bridge • Sampling Items: SO_2, NO_2, CO, SPM, • Sampling Times: 2 times per year • Others: Traffic Volume, Metrological Data
Nitrogen dioxides : NO_2			40 (yearly)		
Carbon monoxide: CO			200 (8 hours)		
Ozone : O_3			-		
Suspended Particulate Matter : SPM			100 (daily) 200 (hourly)	Japan	
Dust			600	Japan	Physical Observation

Water Quality

Items	Sampled Value (Average)	Sampled Value (Maximum)	Standard Value	Referred Standard	Sampling Point, Time, Method
pH			6.5-8.5	Japan	During & After Construction • Sampling Point:4 • Sampling Times:2 times per year • Sampling Items: PH, EC,SS.
Electric Conductivity : EC			<2000mS/m	Environmental Protection Agency, USA	
Turbidity			<5 NTU	Japan	
Dissolved Oxygen : DO			>2	Japan	
Coliform				Not detected	
Oil			<0.50mg/L	Japan	
SS			50mg/m3	Japan	

Waste Material

Monitoring Items	Monitoring Point, Time, Method
• Physical observation of waste materials during the construction: Construction waste material, Deleterious material, Garbage • Physical observation of waste materials after the construction	• Monitoring of treatment of waste material and report: Time per month

Noise and Vibration

Items	Sampled Value (Average)	Sampled Value (Maximum)	Standard Value	Referred Standard	Monitoring Point, Time, Method
Noise			Day:70dB Night:65 dB	Japan	• During and After Construction • Monitoring Points:2 • Monitoring Items: Noise and Vibration : 3times per monitoring day • Monitoring Times: 4 times per year
Vibration			Day:70dB Night: 65dB	Japan	

3. Natural Environment

Ecosystem

Monitoring Items	Monitoring Point, Time, Method
1) Hydrometeor · Physical observation to storm water during rain · Condition of storm water discharge	· Monitoring of discharge condition at drainage system: 1time per month

4. Social Environment

Living and Livelihood

Monitoring Items	Monitoring Point, Time, Method
1) During Construction: Pollution status by Air quality, Noise, Waste material to residents 2) During Construction: Monitoring of Road Users and Residents	· During the construction: 1 time per month

Existing Social Infrastructure

Monitoring Items	Monitoring Point, Time, Method
1) During Construction: Pollution status by Air quality, Noise, Waste material to residents 2) During Construction: Monitoring of Road Users and Residents	· During the construction: 1 time per month

Road Safety

Monitoring Items	Monitoring Point, Time, Method
1) Grasping situation of intersection crossing by school children	· During the construction: 1 time per month

Working Environment

Monitoring Items	Monitoring Point, Time, Method
1) Grasping situation of EHS during the construction	· During the construction: 1 time per week

Traffic Accident

Monitoring Items	Monitoring Point, Time, Method
1) Grasping situation of traffic congestion during the construction 2) Grasping situation of traffic accident during the construction	· During the construction: 1 time per week

資料 4-7　Technical Notes　2016 年 3 月

資料—2　TECHNICAL NOTES

Ministry of Transport, Roads and Bridges
Republic of South Sudan

Ministry of Physical Infrastructure, Central Equatoria
Republic of South Sudan

PREPARATORY SURVEY
ON

THE PROJECT FOR CONSTRUCTION
OF
THE BRIDGES IN JUBA CITY
IN THE REPUBLIC OF SOUTH SUDAN

TECHNICAL NOTES

MARCH 2016

JAPAN INTERNATIONAL COOPERATION AGENCY

CTI ENGINEERING INTERNATIONAL CO., LTD.

添 2-1

Preparatory Survey on the Project for Construction of the Bridges in Juba City
in the Republic of South Sudan

Technical Notes

JICA Survey Team for the Preparatory Survey (the Survey Team) has confirmed the items described in the attached Technical Notes concluded by the representative of the Ministry of Transport, Roads and Bridges (MTRB) which is the responsible and implementing organization on the Project for Construction of the Bridges in Juba City in the Republic of South Sudan (the Project). Based on the Technical Notes, the Survey Team plans to conduct the basic design for the Project including the project cost estimate through analysis of the site survey findings after obtaining the approval from Japan International Cooperation Agency (JICA).

Juba City, Republic of South Sudan
March, 2016

YUZO, MIZOTA
Chief Consultant
JICA Survey Team

Undersecretary's Office
23 MAR 2016

GABRIEL MAKUR
Undersecretary
Ministry of Transport,
Roads and Bridges
Republic of South Sudan

DOMINIC PITIA
Acting Director General
Ministry of Physical Infrastructure
Central Equatoria State

OTIM BONG MIKE
Acting Director General
Ministry of Transport,
Roads and Bridges
Republic of South Sudan
(Witness)

Footpath Design

(1) Pavement Design

Concrete pavement is adopted for the footpath pavement in the view of high durability and commonly-used footpath pavement type in Juba.

(2) Ramp Type Footpath

The design of step for No.1 Bridge (Left side at 0+25m) shall be changed to ramp type foot path at maximum slope of 8% considering universal design.

資料 5　収集資料リスト

5. 収集資料リスト

調査名　南スーダン国　ジュバ市内小規模橋梁整備計画準備調査

番号	名　　称	形態 (図書/ビデオ/地図/写真等)	オリジナル/コピー	発行機関	発行年
1	Drainage Design Manual, 2006	図書	コピー	MTR	2006
2	Bridge Design Manual, 2006	図書	コピー	MTR	2006
3	Geometric Design Manual, 2006	図書	コピー	MTR	2006
4	Pavement Design Manual, 2006	図書	コピー	MTR	2006
5	Site Investigation Manual, July 2006	図書	コピー	MTR	2006
6	Strategic Plan for Road Sector, July 2006	図書	コピー	MTR	2006
7	Invitation for Bids, May 2007	図書	コピー	MTR	2007
8	Monitoring and Evaluation, June 2008	図書	コピー	MTR	2007
9	Training Needs Analysis Report, July 2007	図書	コピー	MTR	2007
10	HIV AIDS Gender Strategic Plan, August 2007	図書	コピー	MTR	2007
11	Training Plan, August 2007	図書	コピー	MTR	2007
12	Human Resource Development, October 2007	図書	コピー	MTR	2007
13	Standard Bid Documents-Procurement of Small Works, October 2007	図書	コピー	MTR	2007
14	Transport Sector Policy (Long), October 2007	図書	コピー	MTR	2007
15	Transport Policy Sector (Abbreviated)	図書	コピー	MTR	2007
16	Environmental Guidelines - Roads & Bridges, Nov 2007	図書	コピー	MTR	2007
17	Environmental Guidelines - Road Transport & Safety, Nov 2007	図書	コピー	MTR	2007
18	Environmental Guidelines - Air, River and Railways, Nov 2007	図書	コピー	MTR	2007
19	MTR Standard Technical Specifications	図書	コピー	MTR	2006
20	Land Act 2009	図書	コピー	RSS	2009
21	National Environmental Policy	図書	コピー	MOE	2012/3
22	Draft Land Policy	図書	コピー	South Sudan Land Commission, RSS	2013/2
23	Landmine/ERW Threat Map, Juba- Kayam Road as of march 2013	図面	コピー	UNMAS	2013/3
24	Environmental Protection Bill,2011	図書	コピー	RSS	2010
25	Proposed Fiscal Year 2013/14 Budget, Directorate of Roads and Bridges Ministry of Physical Infrastructure, Directorate of Roads and Bridges, CES/JUBA	図書	コピー	MOPI	2013
26	MOPI DRB CES Budget Request 2013/14	図書	コピー	MOPI, DRB	2013
27	National Budget Plan Financial Year 2012/13	図書	コピー	MFEP	2012/6
28	Master Plan Lologo North	図面	コピー	MOPI	2012
29	List of land owner	図書	コピー	Lologo	2013

参考：
MTR：Ministry of Transport and Road （現在 MTRB）
MTRB：Ministry of Transport, Roads and Bridges
RSS：Republic of South Sudan
MOE：Ministry of Environment
UNMAS：United Nations Mission Action Service
CES：Central Equatoria States
MOPI：Ministry of Physical Infrastructure
DRB：Directorate of Roads and Bridges
MFEP：Ministry of Finance and Economic Planning

資料 6　概略設計図

MINISTRY OF TRANSPORT, ROADS AND BRIDGES
REPUBLIC OF SOUTH SUDAN

THE PROJECT FOR CONSTRUCTION OF THE BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN

資 6 - 1

DRAWINGS

MARCH 2016

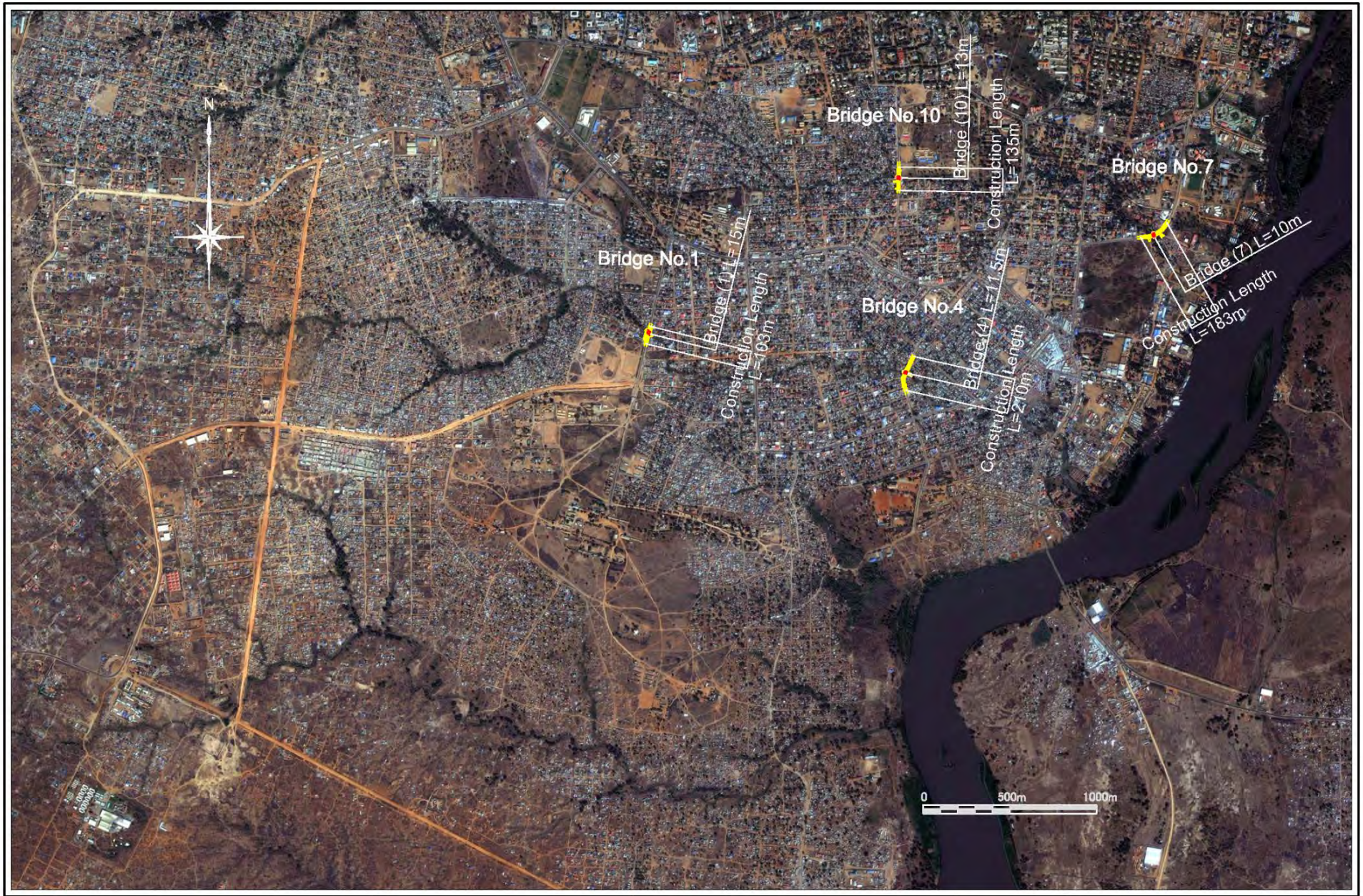
JAPAN INTERNATIONAL COOPERATION AGENCY

CTI ENGINEERING INTERNATIONAL CO., LTD.

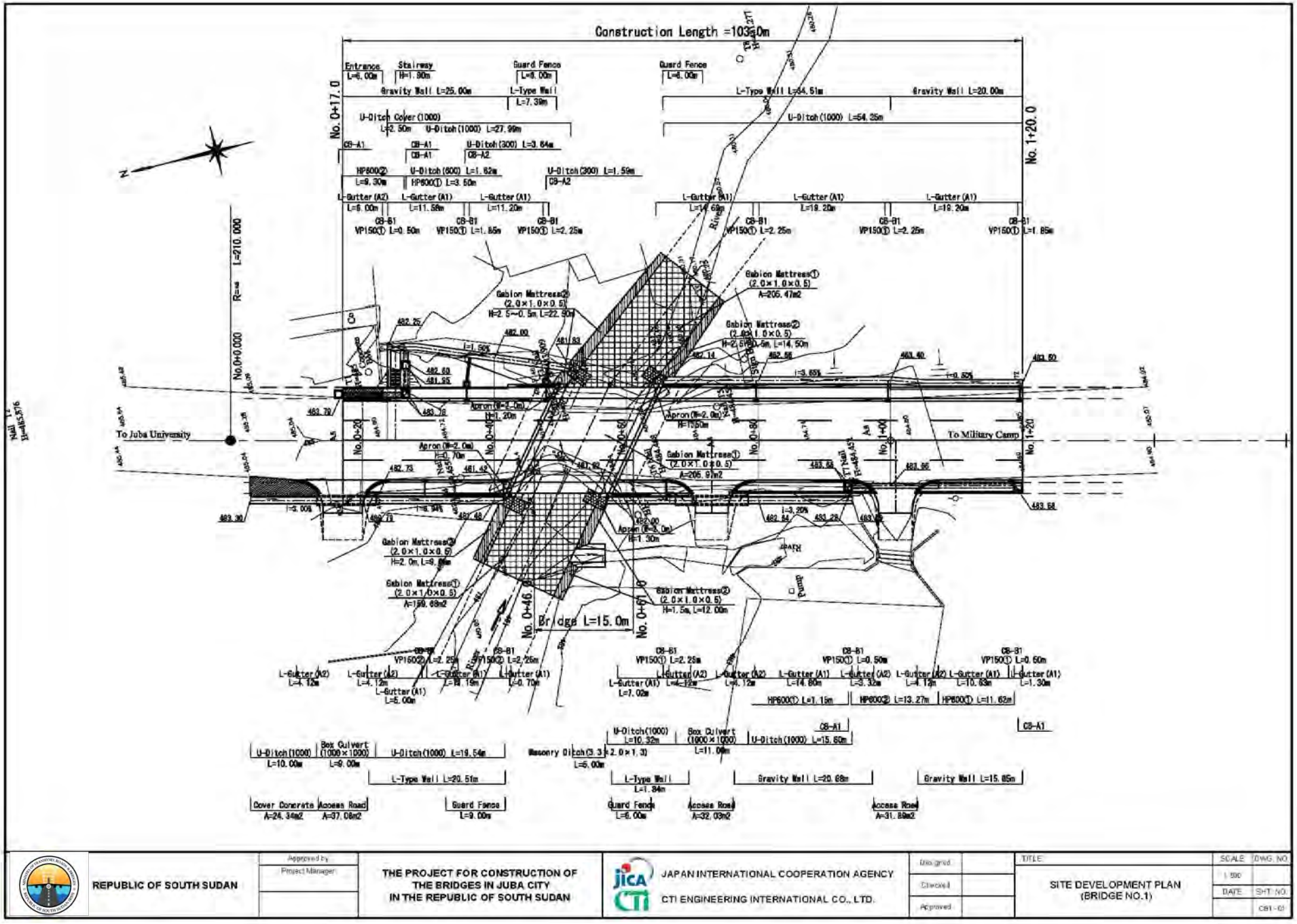
DRAWING LIST

DRAWING TITLE	SHEET NO.	No. of Sheets
GENERAL		
1. LOCATION MAP	GN - 01	1
2. GENERAL NOTES	GN - 02 ～ 04	3
3. PROJECT SITE DEVELOPMENT PLAN	GN - 05	1
4. HORIZONTAL ALIGNMENT	GN - 06 ～ 07	2
BRIDGE NO.1		
5. PLAN	CB1 - 01	1
6. PROFILE	CB1 - 02	1
7. TYPICAL CROSS SECTION	CB1 - 03	1
8. CROSS SECTIONS	CB1 - 04	1
9. JOINT INSTALLATION LAYOUT	CB1 - 05	1
10. FRONT VIEW OF RETAINING WALL	CB1 - 06	1
11. GENERAL VIEW OF BRIDGE	CB1 - 07	1
12. DECK AND GIRDER LAYOUT	CB1 - 08 ～ 09	2
13. DETAIL OF ABUTMENT A1	CB1 - 10	1
14. DETAIL OF ABUTMENT A2	CB1 - 11	1
BRIDGE NO.4		
15. PLAN	CB4 - 01	1
16. PROFILE	CB4 - 02	1
17. TYPICAL CROSS SECTION	CB4 - 03	1
18. CROSS SECTIONS	CB4 - 04 ～ 05	2
19. JOINT INSTALLATION LAYOUT	CB4 - 06	1
20. FRONT VIEW OF RETAINING WALL	CB4 - 07 ～ 08	2
21. GENERAL VIEW OF BRIDGE	CB4 - 09	1
22. DECK AND GIRDER LAYOUT	CB4 - 10	1
23. DETAIL OF ABUTMENT A1	CB4 - 11	1
24. DETAIL OF ABUTMENT A2	CB4 - 12	1

DRAWING TITLE	SHEET NO.	No. of Sheets
BRIDGE NO.7		
25. PLAN	CB7 - 01	1
26. PROFILE	CB7 - 02	1
27. TYPICAL CROSS SECTION	CB7 - 03	1
28. CROSS SECTIONS	CB7 - 04 ～ 05	2
29. JOINT INSTALLATION LAYOUT	CB7 - 06	1
30. FRONT VIEW OF RETAINING WALL	CB7 - 07 ～ 08	2
31. GENERAL VIEW OF BRIDGE	CB7 - 09	1
32. DECK AND GIRDER LAYOUT	CB7 - 10	1
33. DETAIL OF ABUTMENT A1	CB7 - 11	1
34. DETAIL OF ABUTMENT A2	CB7 - 12	1
BRIDGE NO.10		
35. PLAN	CB10 - 01	1
36. PROFILE	CB10 - 02	1
37. TYPICAL CROSS SECTION	CB10 - 03	1
38. CROSS SECTIONS	CB10 - 04 ～ 05	2
39. JOINT INSTALLATION LAYOUT	CB10 - 06	1
40. FRONT VIEW OF RETAINING WALL	CB10 - 07	1
41. GENERAL VIEW OF BRIDGE	CB10 - 08	1
42. DECK AND GIRDER LAYOUT	CB10 - 09	1
43. DETAIL OF ABUTMENT A1	CB10 - 10	1
44. DETAIL OF ABUTMENT A2	CB10 - 11	1
BRIDGE FROM NO.1 TO NO.10		
45. CONCRETE PAVEMENT	CP - 01 ～ 02	2
46. DETAIL OF STRUCTURES	CP - 03 ～ 11	9

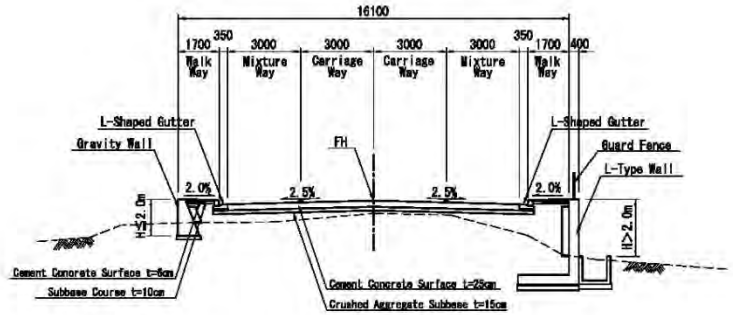


REPUBLIC OF SOUTH SUDAN	Approved by Project Manager	THE PROJECT FOR CONSTRUCTION OF THE BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed Checked Approved	TITLE : PROJECT SITE DEVELOPMENT PLAN	SCALE 1:20,000 DATE	DWG. NO. SHT. NO. GN - 05



REPUBLIC OF SOUTH SUDAN	Approved by: Project Manager	THE PROJECT FOR CONSTRUCTION OF THE BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed Checked Approved	TITLE: SITE DEVELOPMENT PLAN (BRIDGE NO.1)	SCALE: 1:500 DWG. NO. DATE SHT. NO.: CB1-01

BRIDGE (NO. 1)



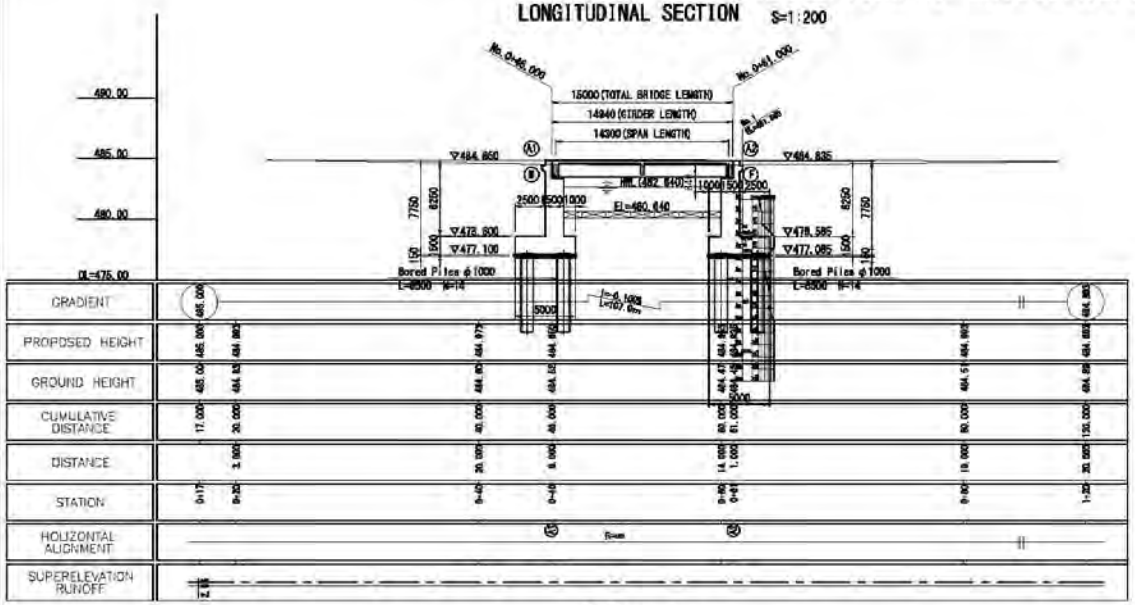
EMBANKMENT SECTION

NOTES : Expansion joints of walkway are installed at 3.0m interval.

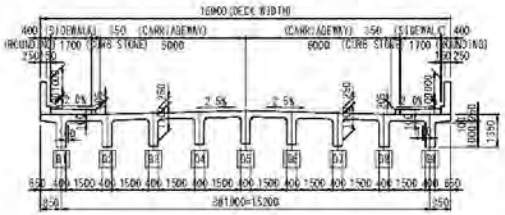
REPUBLIC OF SOUTH SUDAN	Approved by: Project Manager	THE PROJECT FOR CONSTRUCTION OF THE BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed / Checked / Approved	TITLE: TYPICAL CROSS SECTION BRIDGE NO.1	SCALE: 1:200	DWG. NO. CB1 - 03
						DATE:	SHT. NO.

GENERAL VIEW OF BRIDGE NO.1

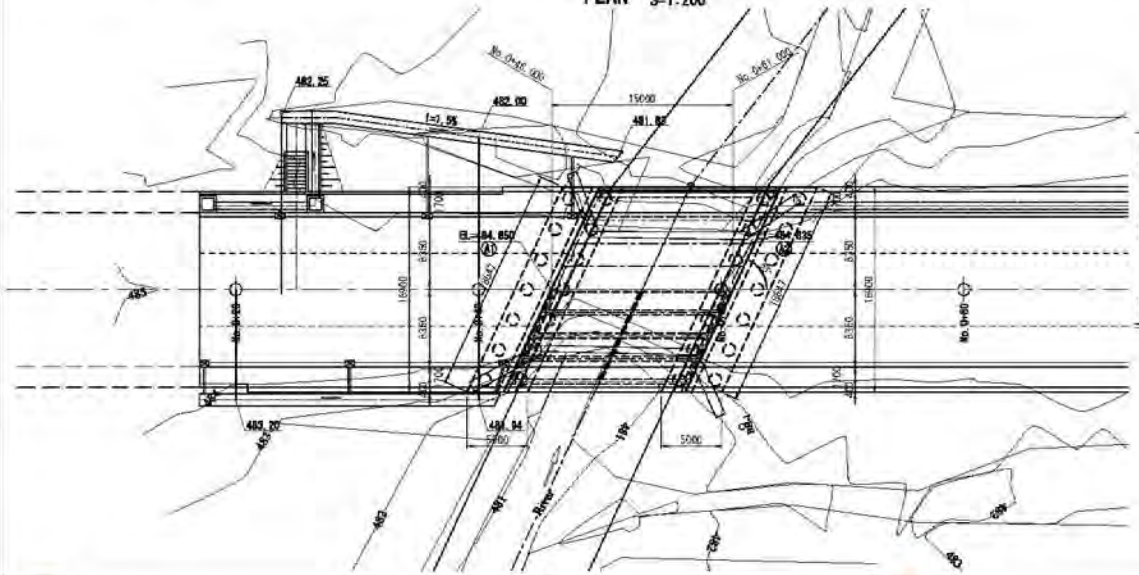
LONGITUDINAL SECTION S=1:200



Cross Section S=1:100

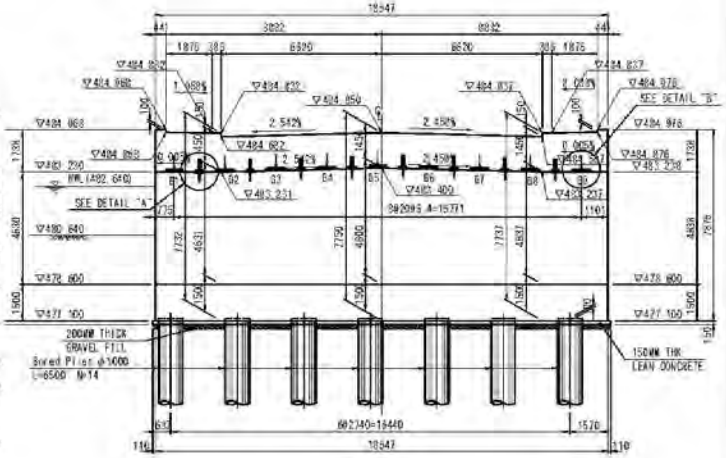


PLAN S=1:200

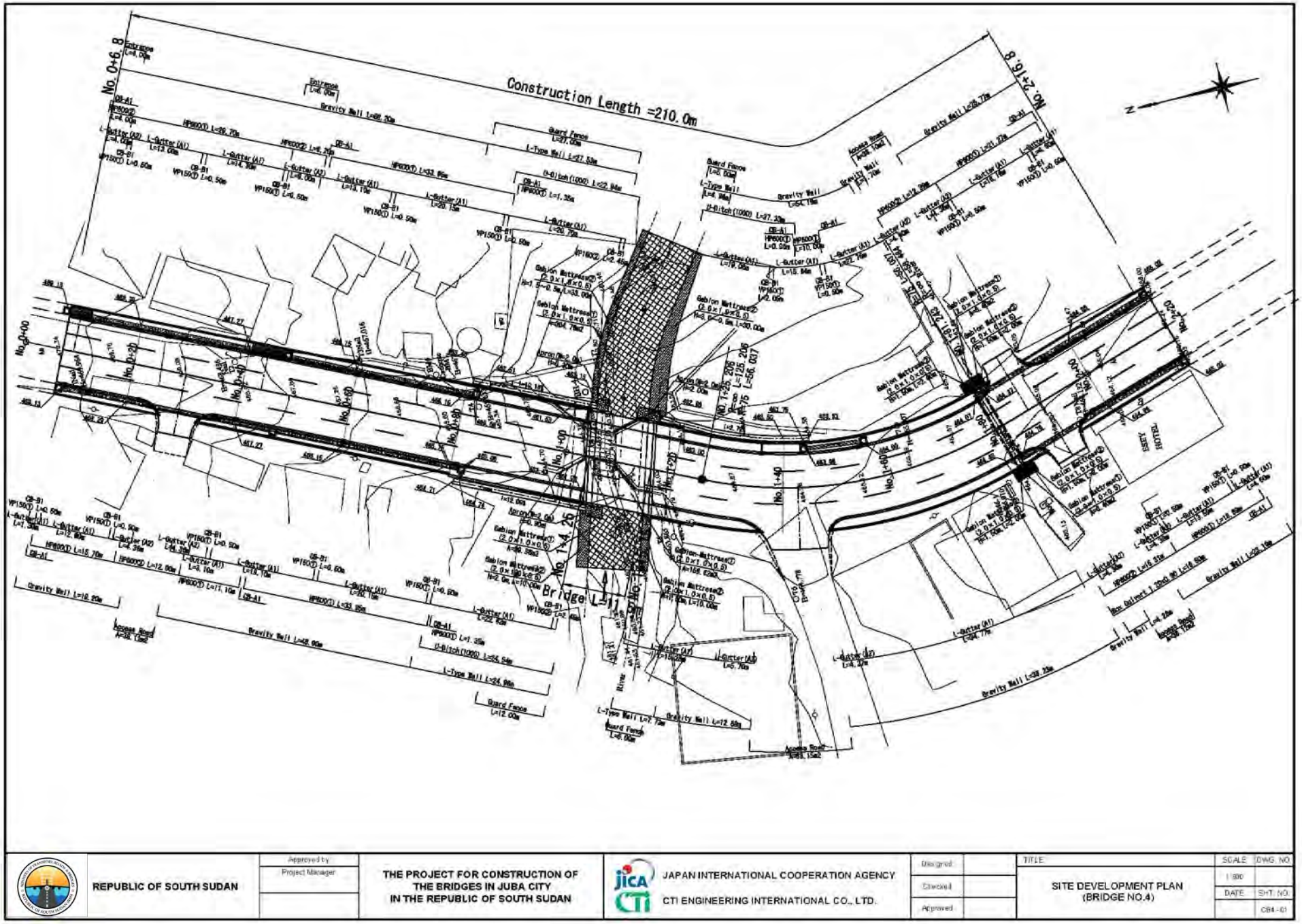


Front View S=1:100

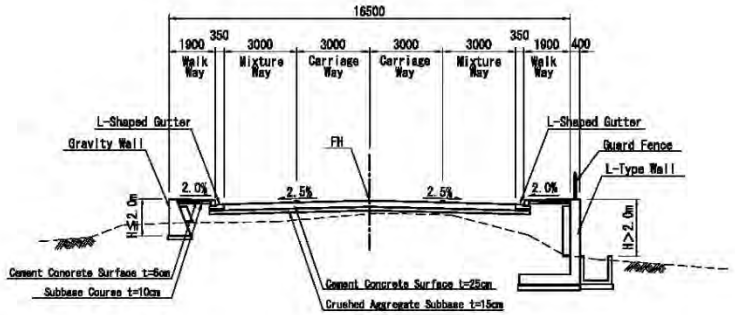
(A1)



MINISTRY OF TRANSPORT, ROADS AND BRIDGES (MTRB) REPUBLIC OF SOUTH SUDAN	Approved by: Project Manager	THE PROJECT FOR CONSTRUCTION OF BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JICA CTI	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed: Checked: Approved:		TITLE: GENERAL VIEW OF BRIDGE NO.1	SCALE: 1:200	DWG. NO.
								DATE:	SHEET NO.


Construction Length =210.0m
No.0+6.8
No.2+16.8
Bridge L=11.20m
REPUBLIC OF SOUTH SUDAN
Approved by
Project Manager
THE PROJECT FOR CONSTRUCTION OF THE BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN
JAPAN INTERNATIONAL COOPERATION AGENCY
CTI ENGINEERING INTERNATIONAL CO., LTD.
Designed
Checked
Approved
TITLE
SITE DEVELOPMENT PLAN (BRIDGE NO.4)
SCALE
1:800
DWG. NO.
DATE
SHT. NO.
CB4-01

BRIDGE (NO. 4)



EMBANKMENT SECTION

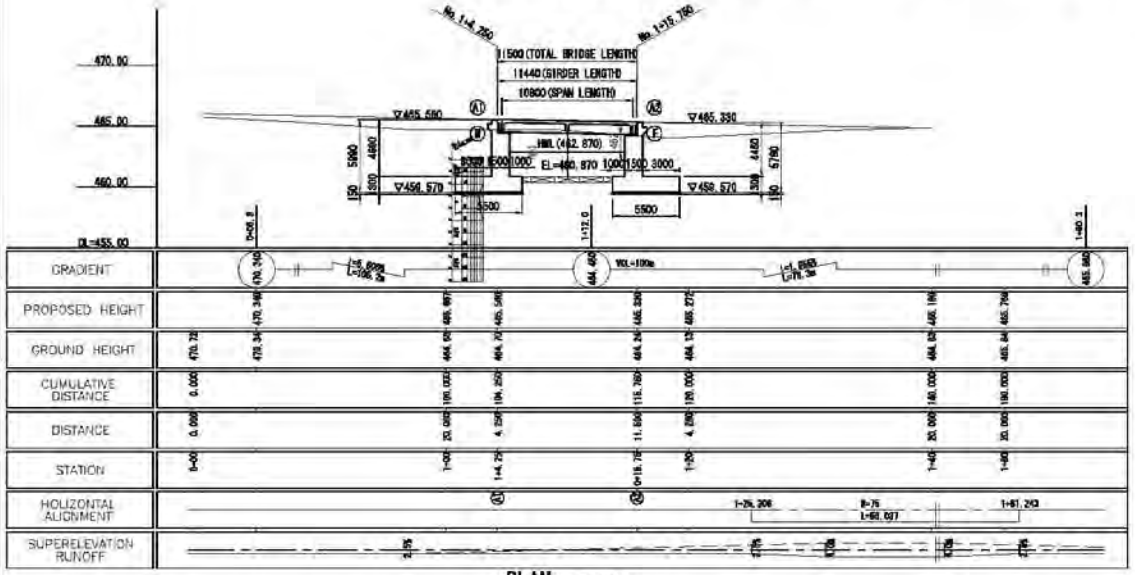
NOTES : Expansion joints of walkway are installed at 3.0m interval.

REPUBLIC OF SOUTH SUDAN	Approved by: Project Manager	THE PROJECT FOR CONSTRUCTION OF THE BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed / Checked / Approved	TITLE: TYPICAL CROSS SECTION BRIDGE NO.4	SCALE: 1:200	DWG. NO.: CB4 - 03
						DATE:	SHT. NO.:

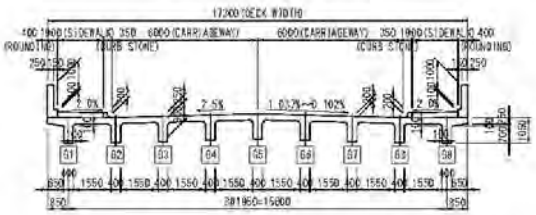
資 6 - 8

GENERAL VIEW OF BRIDGE NO. 4

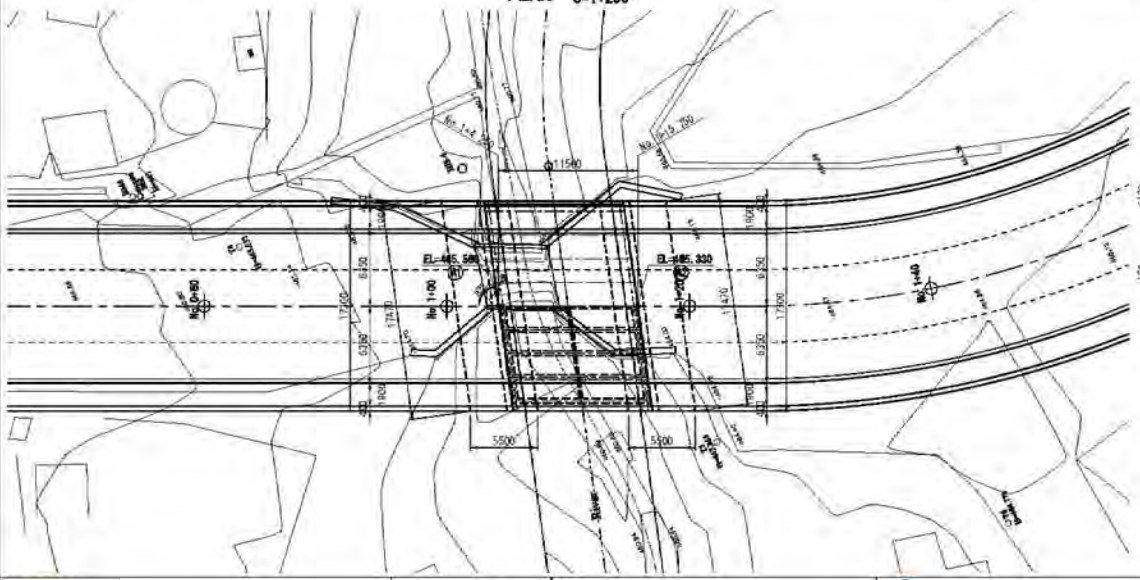
LONGITUDINAL SECTION S=1:200



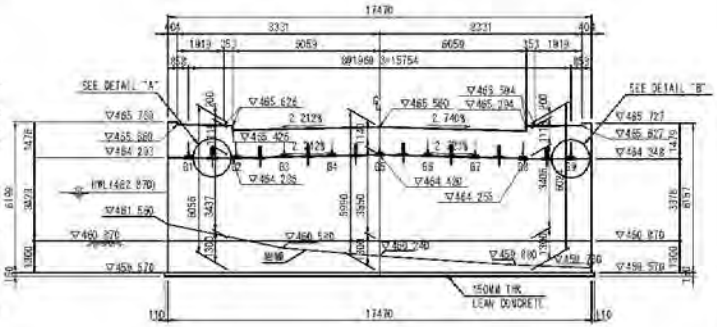
Cross Section S=1:100



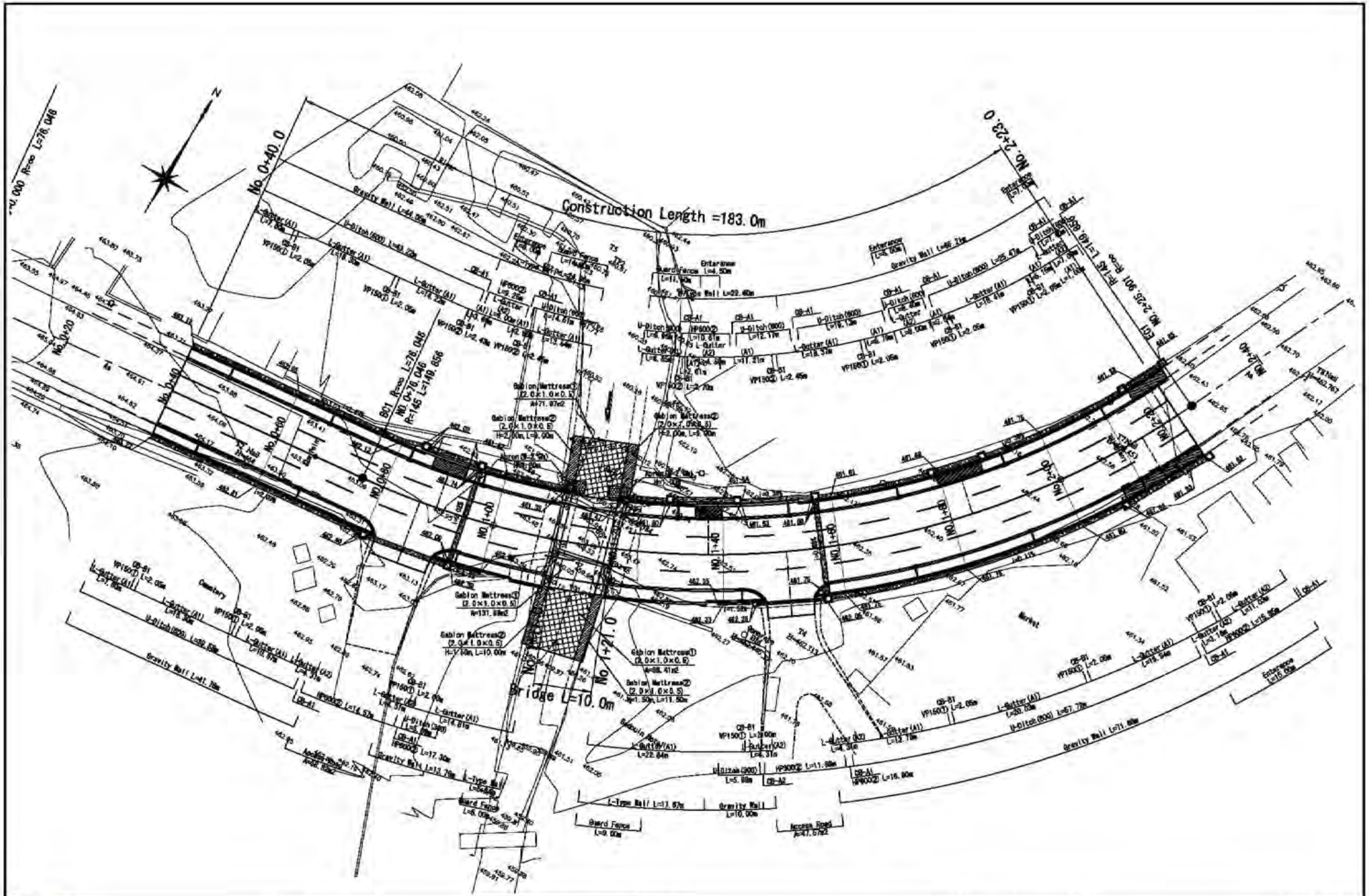
PLAN S=1:200



Front View S=1:100 (A1)

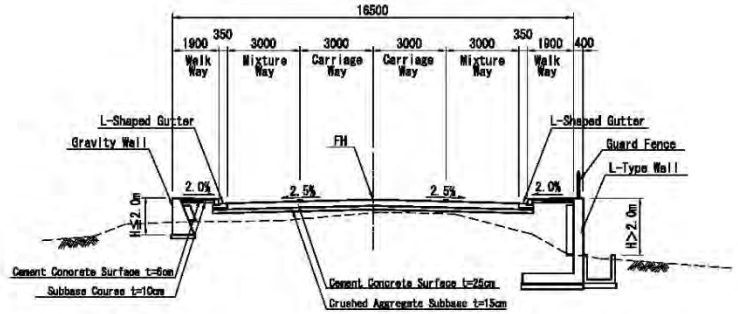


MINISTRY OF TRANSPORT, ROADS AND BRIDGES (MTRB) REPUBLIC OF SOUTH SUDAN	Approved by: Project Manager	THE PROJECT FOR CONSTRUCTION OF BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed		TITLE: GENERAL VIEW OF BRIDGE NO.4	SCALE: 1:200
				Checked			DWG. NO.
				Approved			DATE
							SHEET NO. GB4-60



REPUBLIC OF SOUTH SUDAN	Approved by Project Manager	THE PROJECT FOR CONSTRUCTION OF THE BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed Checked Approved	TITLE SITE DEVELOPMENT PLAN (BRIDGE NO.7)	SCALE 1:500 DATE	DWG. NO. SHT. NO. CB7-01

BRIDGE (NO. 7)



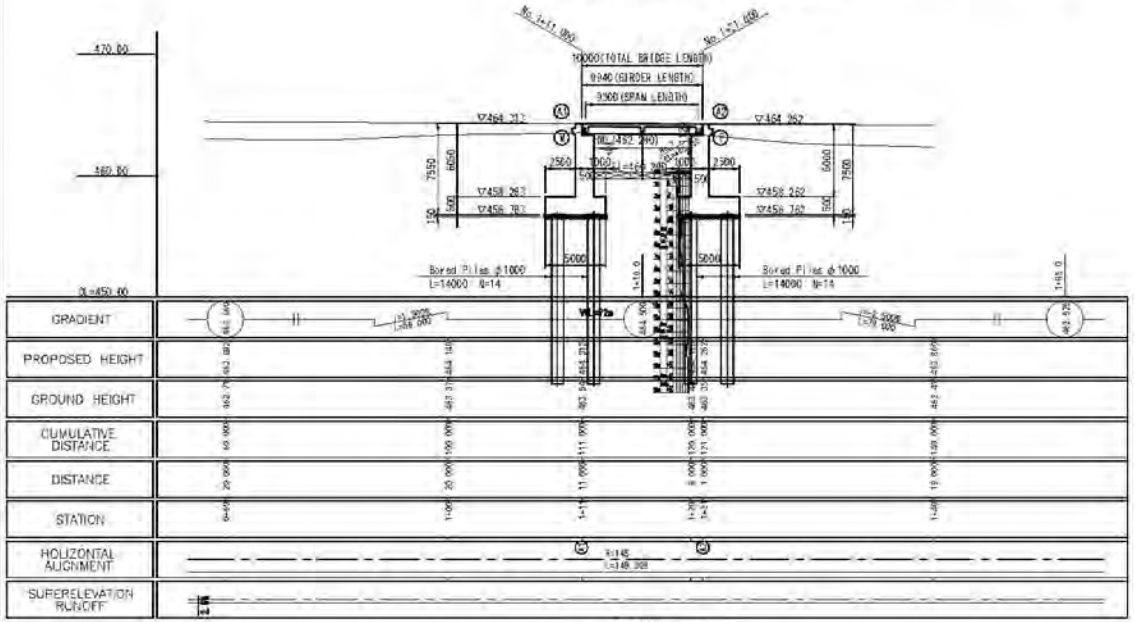
EMBANKMENT SECTION

NOTES : Expansion joints of walkway are installed at 3.0m interval.

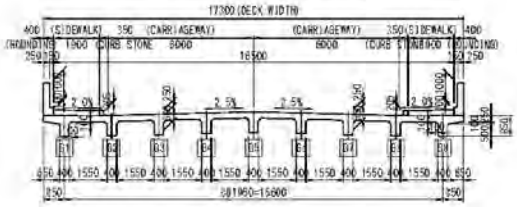
REPUBLIC OF SOUTH SUDAN	Approved by: Project Manager	THE PROJECT FOR CONSTRUCTION OF THE BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed / Checked / Approved	TITLE: TYPICAL CROSS SECTION BRIDGE NO.7	SCALE: 1:200	DWG. NO. CB7 - 03
						DATE	SHT. NO.

GENERAL VIEW OF BRIDGE NO.7

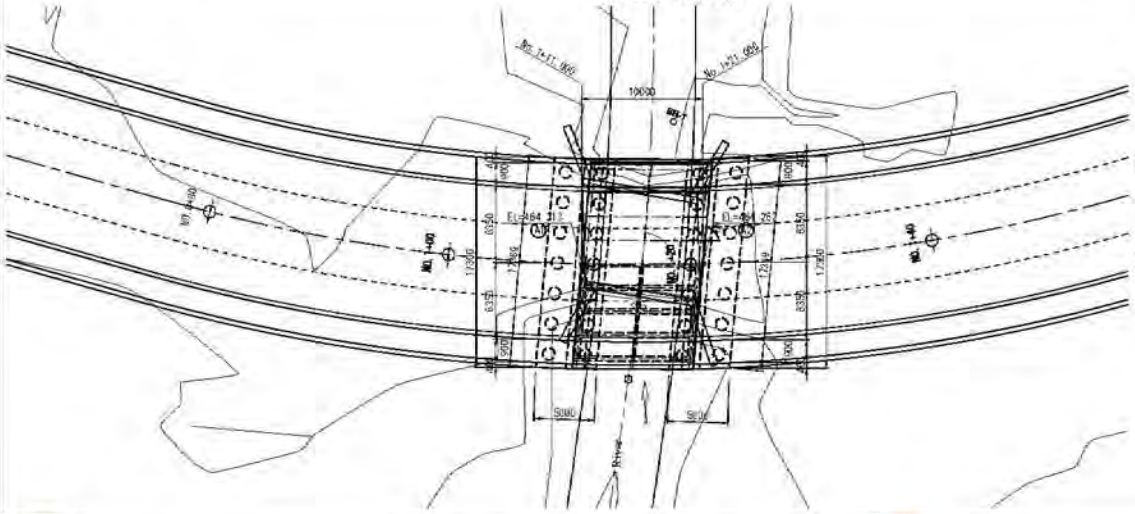
LONGITUDINAL SECTION S=1:200



Cross Section S=1:100

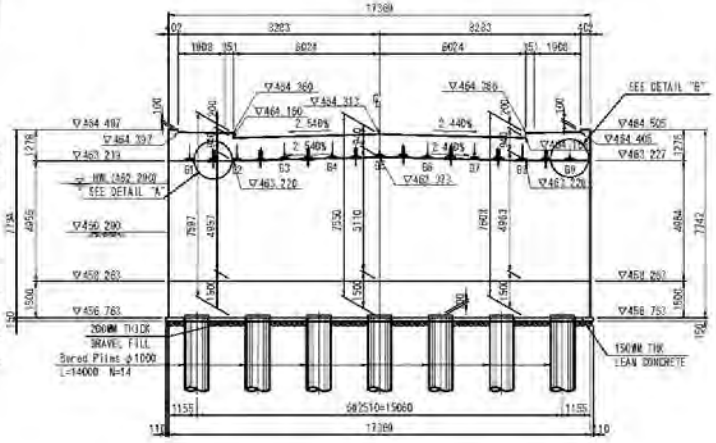


PLAN S=1:200

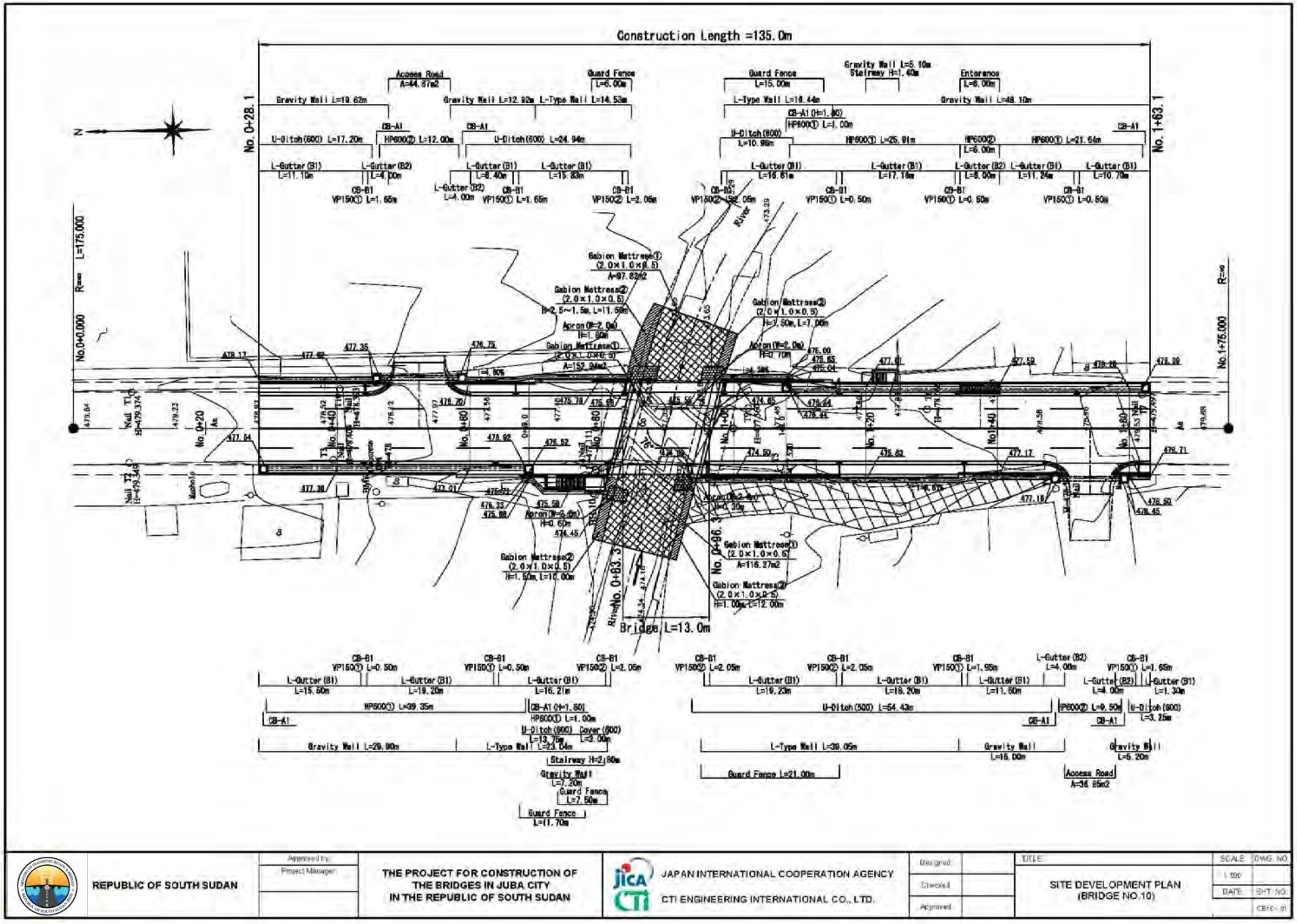


Front View S=1:100

(A1)

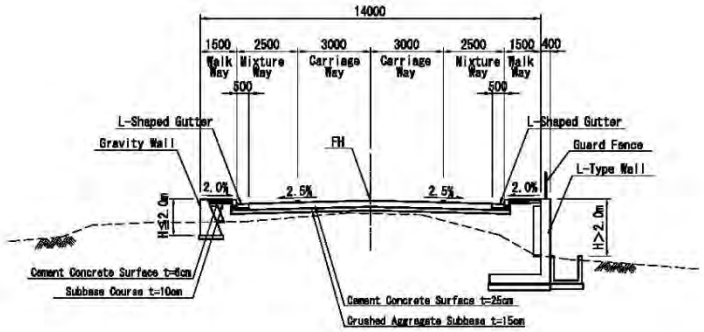


MINISTRY OF TRANSPORT, ROADS AND BRIDGES (MTRB) REPUBLIC OF SOUTH SUDAN	Approved by: Project Manager	THE PROJECT FOR CONSTRUCTION OF BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed: Checked: Approved:		TITLE: GENERAL VIEW OF BRIDGE NO.7	SCALE: 1:200 DATE: SHEET NO. GBR-00



REPUBLIC OF SOUTH SUDAN	Approved by: Project Manager	THE PROJECT FOR CONSTRUCTION OF THE BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed Checked Approved	TITLE: SITE DEVELOPMENT PLAN (BRIDGE NO.10)	SCALE: 1:500	DWG. NO.
						DATE	SHT NO. CB10-01

BRIDGE (NO.10)



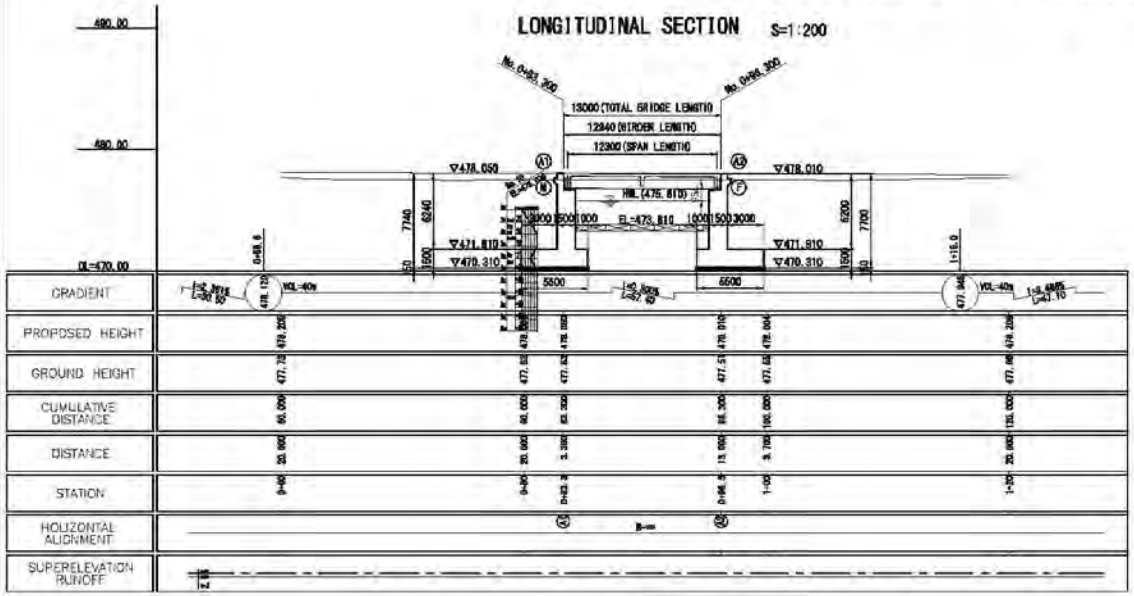
EMBANKMENT SECTION

NOTES : Expansion joints of walkway are installed at 3.0m interval.

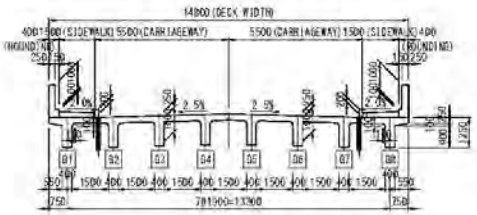
REPUBLIC OF SOUTH SUDAN	Approved by: Project Manager	THE PROJECT FOR CONSTRUCTION OF THE BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed / Checked / Approved	TITLE: TYPICAL CROSS SECTION BRIDGE NO.10	SCALE: 1:200	DWG NO.
						DATE:	SHT NO. CB10-03

GENERAL VIEW OF BRIDGE NO.10

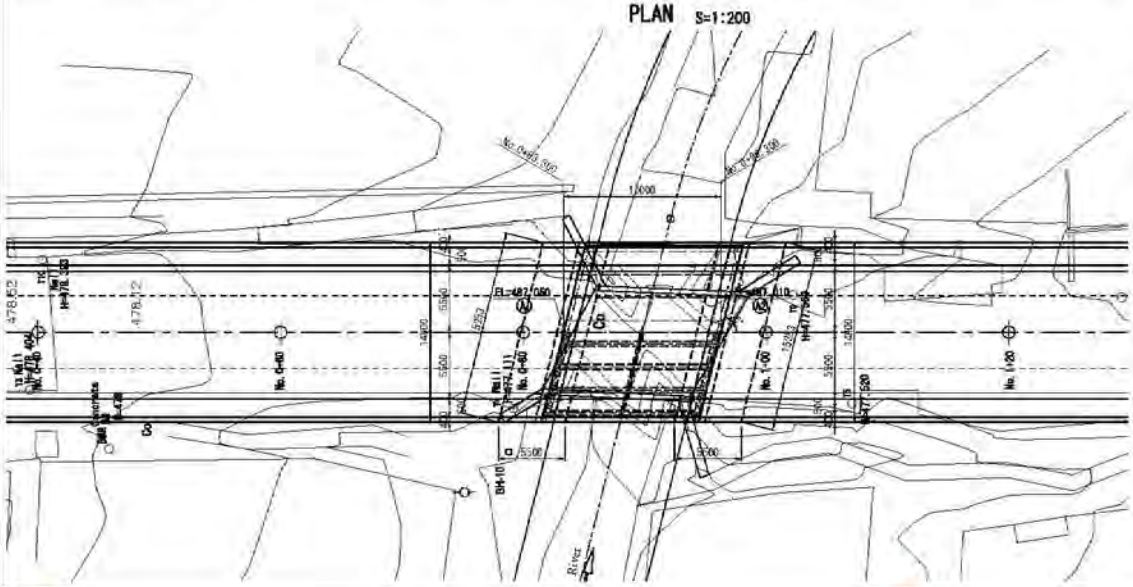
LONGITUDINAL SECTION S=1:200



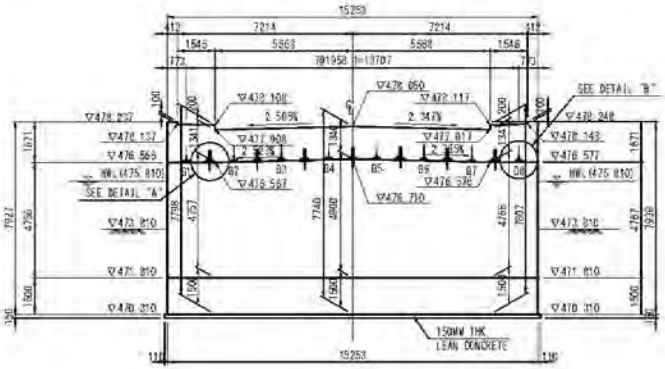
Cross Section S=1:100



PLAN S=1:200



Front View S=1:100 (A1)



MINISTRY OF TRANSPORT, ROADS AND BRIDGES (MTRB) REPUBLIC OF SOUTH SUDAN	Approves by: Project Manager	THE PROJECT FOR CONSTRUCTION OF BRIDGES IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN	JAPAN INTERNATIONAL COOPERATION AGENCY CTI ENGINEERING INTERNATIONAL CO., LTD.	Designed: Checked: Approved:		TITLE: GENERAL VIEW OF BRIDGE NO.10	SCALE: 1:200 DATE: SHEET NO.