

## **6-5: Soundness of Bridges**

### Evaluation Method of Bridge Soundness

Evaluation Item			Rating Point (E.P.)	Bridge (E.P.)	Weight Factor(W/F)	Point (E.P.)*(W/F)
Durability	Degree of superstructure damage and defect		good to bad 1 2 3 4		0.6	
	Degree of substructure damage and defect		good to bad 1 2 3 4		0.4	
Load Capacity	Low traffic volume ( heavy vehicle with axle load less than 7 ton )		1		0.2	
	High traffic volume ( heavy vehicle with axle load greater than 7 ton)(Heavy Vehicle ratio 12%)		3		0.2	
Function	Construction record	Constructed after 1970 (use less than 30 years )	1		0.1	
		Constructed before 1970 (use more than 30 years )	3		0.1	
	Effective width and Flood flow	Sufficient width for traffic capacity and flood flow	1		0.2	
		Insufficient width for traffic capacity and flood flow	3		0.2	
Overall evaluation for bridge (Range of point)		D: Sound	1.5~2.5		Min. 1.5	D
		C: Fairly sound	2.5~3.5			C
		B: Unsound / Lack of safety	3.5~4.5			B
		A: Danger	4.5~5.5			A
					Max. 5.5	

### Table-A Bridge Soundness Sheet (Sheet No.1)

NAME OF BRIDGE: Dood Selbe River B Trunk Road		CROSSING: Selbe River		INSPECTION BY		INSPECTION: 2000, June 9		INSPECTION BY			
Design Information		* Yes No		Construction By China		Date of Construction: 1963		Maintenance by			
Superstructure		Reinforced Concrete T-Girder		Reinforced Concrete		Russian 22 ton		Load limitation *No			
Substructure		Reinforced Concrete		Reinforced Concrete		Reversed		Design Loading			
Substructure		Reinforced Concrete		Reinforced Concrete		Tetrapole column		Design Standard			
Pier		45.6m		Span		4@11.4m		Skew of Bridge			
Overall		9.0m		Carriage: 7.0m		Pedestrian: 2@1m		Condition of Crossing			
Kind: communication		Number		4		Ratio of Heavy Veh. 2.3 (0veh./day)		Others			
Traffic Volume		19,500veh./day		Ratio of Heavy Veh. 2.3 (0veh./day)		Others		Others			
Pavement		Deck Slab		Main Beam		Painting		Expansion Joint			
Others		Others		Others		Others		Others			
Component		Conditions Of Damage		Rating		Component		Conditions of Damage		Rating	
Pavement		Good, Wave, *Rut, *Crack, *Pothole		4		Abutment: Reversed		Good, *Crack, *Spall, Deformation, *Rebar-exposed, *Broken, Settlement, Scouring,		3	
Surface		Others (Wear, bumpy surface)		4		(Type: RC)		Others (Especially broken at shoe beds)		3	
Curb, Sidewalk		Good, *Scale, *Crack, *Spall, *Rebar-exposed		3		Abutment		Good, Crack, Spall, Deformation, Rebar-exposed, Broken, Settlement, Scouring,		4	
Railing		Good, Scale, Crack, *Spall, Rebar-exposed		4		(Type)		Others		4	
Deck slab		Good, (Broken, nothing)		4		Pier: T-Circle column		Good, *Crack, *Spall, Deformation, *Rebar-exposed, *Broken, Settlement, Scouring,		4	
(Type: Steel pipe)		Good, Honeycombs, *Crack, Deformation, *Rebar-exposed		3		(Type: RC)		Others (Especially broken at shoe beds)		4	
(Type: RC)		Others (Lime water leakage, Gap at slab joints)		4		Pier		Good, Crack, Spall, Deformation, Rebar-exposed, Broken, Settlement, Scouring,		4	
Main Beam		Good, Honeycombs, *Crack, Deformation, *Rebar-exposed, *Lime water		4		Others		Others		4	
(Type: RC)		Others (Crack at outside beam, all parts and end parts)		2		*		corroded mark		2	
Cross Beam		Good, Crack, Deformation, Rebar-exposed		2		Condition		OVERALL EVALUATION RATING		Final rating	
(Type: RC)		Gap at joint of cross beams		2		Condition		1. No damage detected on the basis of the inspection results.		Super Structure	
Painting		Good, Abnormal Sound, Deformation, *Gap, Broken		4		Condition		2. Damage has been detected and a follow-up survey is required.		Sub Structure	
Exp Joint		Others (None)		4		Condition		3. There is significant damage and a detailed survey needs to be carried out to establish whether repair work is to be carried out or not.		3	
(Type: None)		Good, Abnormal Sound, *Deformation, Gap, Broken		4		Condition		4. There is significant damage and urgent repair is required on the bridge has to be closed to traffic or restriction on vehicle weight to be imposed.		3	
Shoe		(Type: None, only sheets)		4		Condition		(or to be re-constructed new bridge)		3	
Drainage		Good, Closed Leakage, Broken, Others		2		Condition		<Remarks>		3	
(Type: Hole only)		<Existing conditions of Bridge >		2		Condition		<Remarks>		3	

See Table-B Photo Sheet

Table-B Photo for Existing Conditions of Bridge (No.1-1)





<p>Kind 1. Road 2. Bridge</p>	<p>Location Doon Selbe Bridge 4880m</p>	<p>Investigated on 2000, June 7, 8</p>	<p>Photo by Y.TAKAI</p>
<p>Comments General view: Bridge length: 45.6m Carrageway: 7m Sidewalk: 2@1m (from West to East)</p>		<p>Location</p>	
<p>Comments Profile of bridge, revetment of Selbe river (from downstream)</p>		<p>Location</p>	

Table-B Photo for Existing Conditions of Bridge (No.1 – 2)









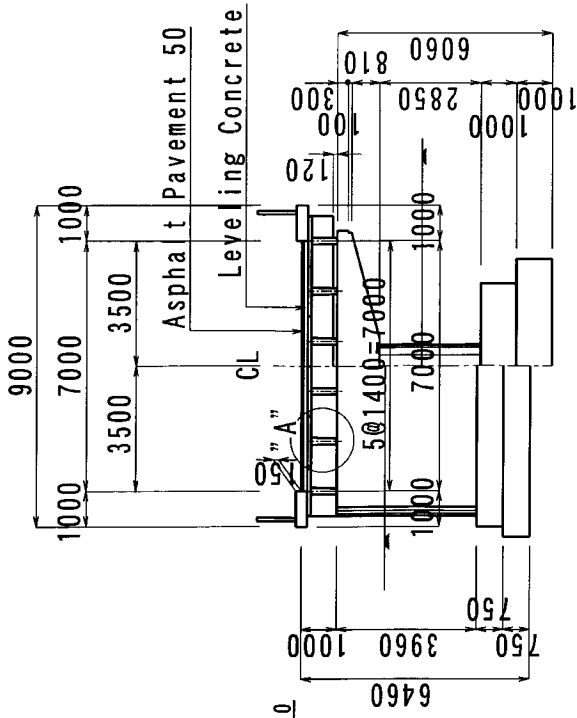
Kind	Investigated on	Photo by
1. Road	2. Bridge	
<p>Location</p> 	<p>Comments</p> <p>General view of beam, sub-structure:                      Poor conditions, scaling of beam &amp; slab                      Scouring at piers</p>	<p>Location</p> 
<p>Location</p> 	<p>Comments</p> <p>East abutment:                      Spalling, destruction at shoe beds                      None shoes</p>	<p>Comments</p> <p>West abutment:                      Spalling, destruction at shoe beds (10cm depth)                      None shoes</p>
<p>Location</p> 	<p>Comments</p> <p>2nd pier from West:                      Spalling, destruction at shoe beds, reinforced bars exposed                      Overage of concrete                      None shoes</p>	<p>Comments</p> <p>West abutment:                      Spalling, destruction at shoe beds (10cm depth)                      None shoes</p>

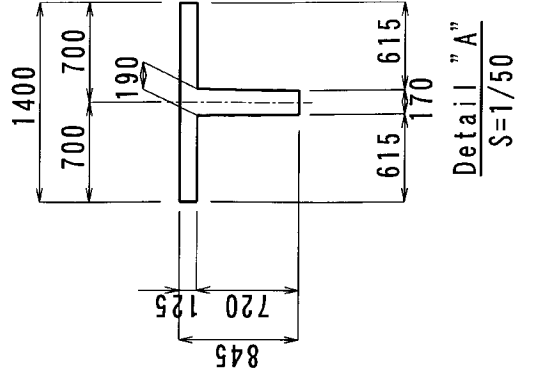
Table-B Photo for Existing Conditions of Bridge (No.1-3)

Kind	Investigated on	Photo by	Comments
1. Road	2. Bridge		
Location	Location		<p>Beam conditions:                      Vertical crack at beam end (1 to 3 cm )                      Lime-water leakage, scaling at beams                      Shoe beds broken                      Heavy damage of all structures</p>
Location	Location		<p>Comments                      Embankment part of East side: RC pipe for drain <math>\phi</math> 1.2m, thickness 8cm</p>
Comments	Comments		<p>Beam conditions:                      Vertical cracks at outside beams (less than 0.5mm width)</p>
Comments	Comments		<p>Comments                      Railway at downstream                      Bridge length 40m, 3 span (from North to South)</p>

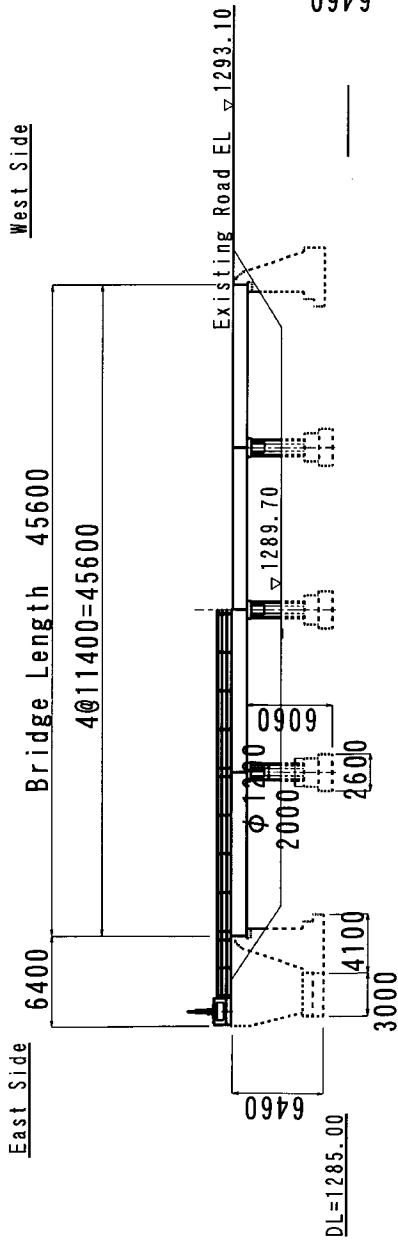
General View Of Existing Selbe River Bridge  
(Dood Selbe Bridge)



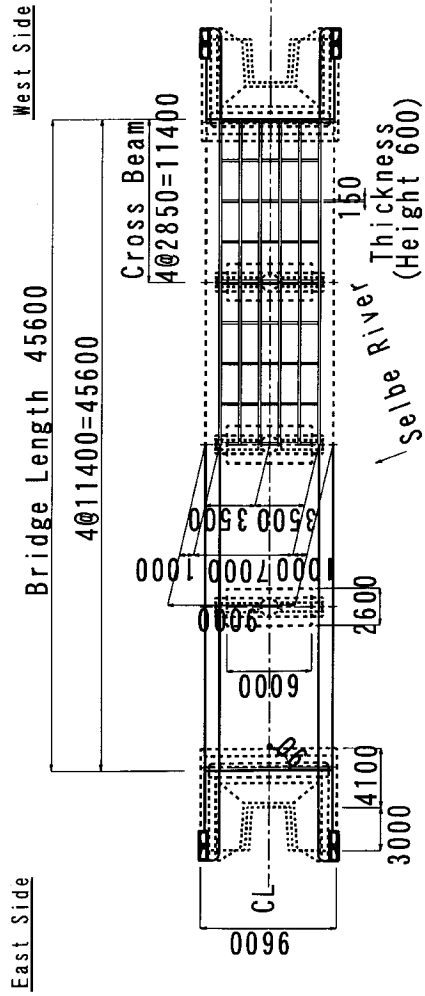
Abutment Pier  
Cross Section  
S=1/200



Detail "A"  
S=1/50



Profile  
S=1/500




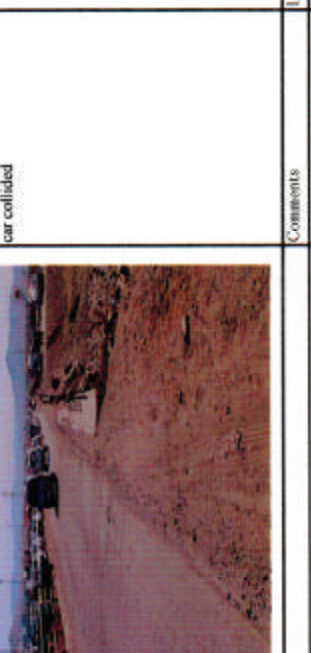
Plan  
S=1/500

**Table-A Bridge Soundness Sheet (Sheet No. 2)**

NAME OF BRIDGE: Khoroolol Br.		Trunk Road		INSPECTION: 2000, June 10		INSPECTION BY		Y. Takai	
Design Information		*No		Construction By: China		Date of Construction: 1963		Maintenance by: UB City	
Type of Bridge		Superstructure		Reinforced Concrete T-Girder		Design Loading		Russian 22 ton	
Substructure		Abutment		Reinforced Concrete Reverse U		Design Standard		BS AASHTO * RUSSIA OTHERS( )	
Pier		Pier		Skew of Bridge		*Square		Skew (deg. R= )	
Length of Bridge		11.4m		Span		11.4m		Condition of Crossing	
Width of Bridge		9.0m		Carriage: 7.0m		Pedestrian: 2@1m		Old River	
Affixed Articles		Kind/communication		Number		1		Free Board	
Traffic Volume		19,500veh./day		Ratio of Heavy Veh. 2,310veh./day		Others		11m	
Final Record of Repair		Pavement		Deck Slab		Main Beam		Painting	
Others		Expansion Joint		Bearing		Drainage		Railing	
		Substructure		Curb		Affixed Articles			
Component	Conditions Of Damage	Rating	Component	Conditions of Damage	Rating				
Pavement	Good, Wave, *Rut, *Crack, *Pothole	4	Abutment	Good, *Crack, *Spall, Deformation, *Rebar-exposed, Broken, Settlement, Scouring,	3				
(Type: As)	Others (Wear, bumpy surface)	4	(Type: RC)	Others (Especially broken at shoe beds)					
Curb, Sidewalk	Good, *Scale, *Crack, *Spall, *Rebar-exposed	4	Abutment	Good, Crack, Spall, Deformation, Rebar-exposed, Broken, Settlement, Scouring,					
(Type: RC)	Others (Wear, bumpy surface)	4	(Type)	Others					
Railing	Good, Seale, Crack, *Spall, Rebar-exposed	3	Pier	Good, Crack, Spall, Deformation, Rebar-exposed, Broken, Settlement, Scouring,					
(Type: Steel Pipe)	Others (Broken)	3	(Type)	Others					
Deck slab	Good, Honeycombs, *Crack, Deformation, Rebar-exposed	3	Pier	Good, Crack, Spall, Deformation, Rebar-exposed, Broken, Settlement, Scouring,					
(Type: RC)	Others (Lime water leakage, Gap at slab joints)	3	(Type)	Others					
Main Beam	Good, Honeycombs, *Crack, Deformation, Rebar-exposed	4	Others						
(Type: RC)	Others (Crack at outside beam, all parts)	4							
Cross Beam	Good, *Crack, Deformation, Rebar-exposed	4							
(Type: RC)	Others (Gap at joint of cross beam)	4							
Painting	Condition								
Exp. Joint	Good, Abnormal Sound, Deformation, *Gap, Broken		OVERALL EVALUATION RATING						
(Type: None)	Others (None)		1. No damage detected on the basis of the inspection results.						
Shoe	Good, Abnormal Sound, *Deformation, Gap, Broken, Others	4	2. Damage has been detected and a follow-up survey is required.						
(Type: None, only sheets)	Good, Abnormal Sound, *Deformation, Gap, Broken, Others	4	3. There is significant damage and a detailed survey needs to be carried out to establish whether repair work is to be carried out or not.						
Drainage	Good, Clogged Leakage, Broken, Others	4	4. There is significant damage and urgent repair is required or the bridge has to be closed to traffic or restriction on vehicle weight to be imposed.						
(Type: Hole only)		2	(or to be re-constructed new bridge)						
<- Existing conditions of Bridge >  Sec Table-B Photo Sheet  <- Remarks >									



Table-B Photo for Existing Conditions of Bridge (No.2-1)

<p>Kind</p>	<p>1. Road</p>	<p>2. Bridge</p>	<p>Investigated on</p>	<p>Photo by</p>
<p>Location</p>	<p>14th Khorocotol Bridge 5K815m</p>	<p>2000, June 7, 8</p>	<p>Y.TAKAI</p>	<p>Comments</p>
<p>General view of bridge:                  Bridge length 11.4m                  Carriageway 7m                  Sidewalk 2@1m                  Surface of unevenness,                  wear,deformed,                  broken curb by                  car collided</p>			<p>Profile, revetment of bridge:                  Ground for market parking                  at upstream side                  No river at upstream side                  (from downstream)</p>	<p>Comments</p>
<p>Location</p>	<p>Main beam, cross beam:</p>	<p>Leakage of water, lime at                  slab joints</p>	<p>Defects at cross beam due                  to joint gap (not rigid)                  Overage of all concrete                  structures</p>	<p>Beam conditions:                  Vertical cracks at out side                  beams                  (less than 0.5mm)</p>
