A P P E N D I X

A P P E N D I X

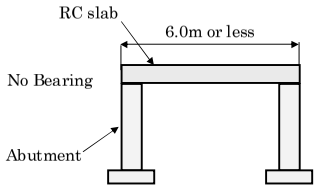
BASIC KNOWLEDGE OF BRIDGE

Bridge and Culvert Type

<Concrete Bridge >

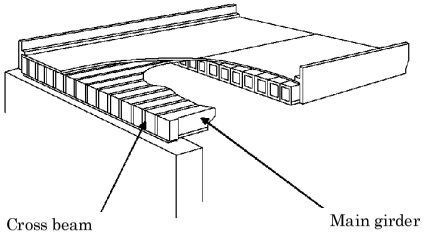
1. Small Slab Bridge (Former "Slab Culvert")

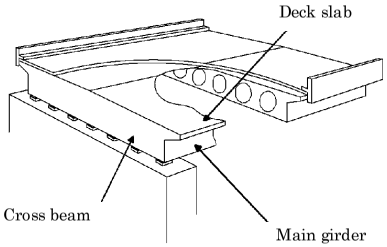
A structure comprising a slab(s) without girders supported on abutments/piers and having a length of 6.0m or less measured at right angles between the extreme vent way boundaries.



2. RC Slab Bridge

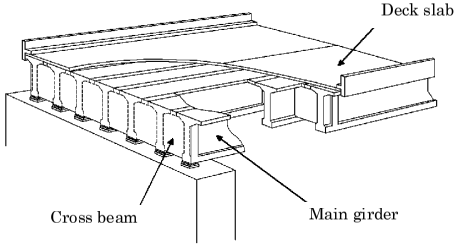
In general, the span is less than 16m





3. RC Girder Bridge

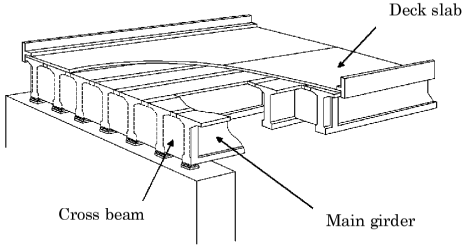
In general, the span is less than 20m. In special case It can be less than 30m



Bhuvagati Bridge in SirajGanj

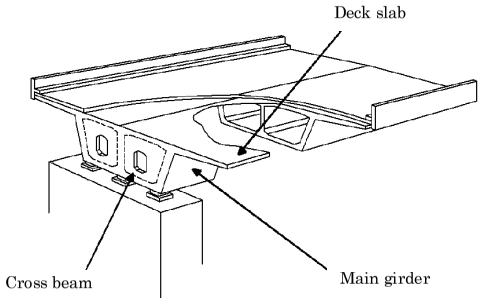
4. PC Girder Bridge

In general, the span is more than 20m



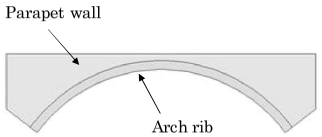
Kanchpur Bridge in Narayanganj

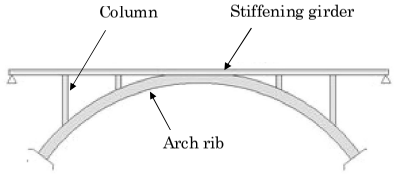
5. PC Box Girder Bridge

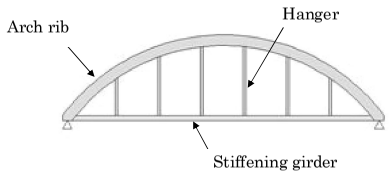


Rupsha Bridge

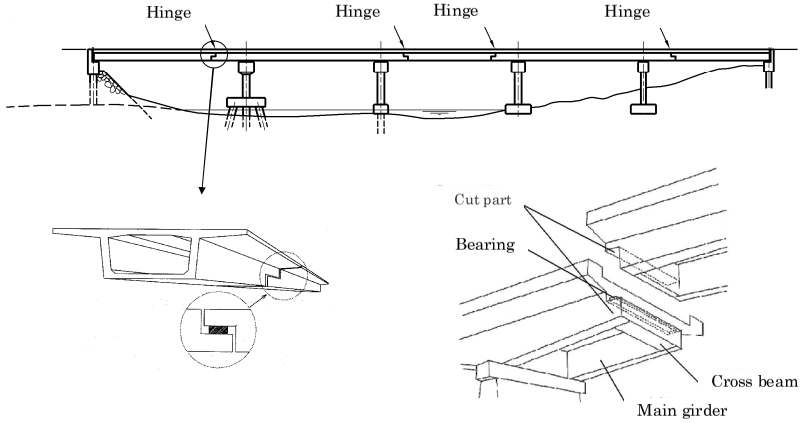
6. Concrete Arch Bridge



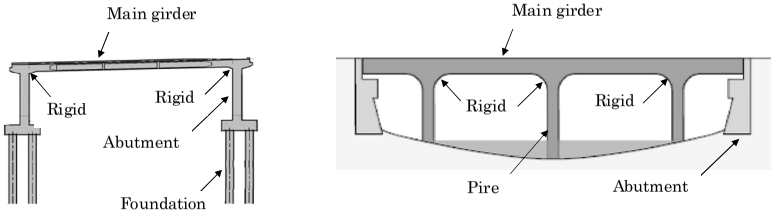




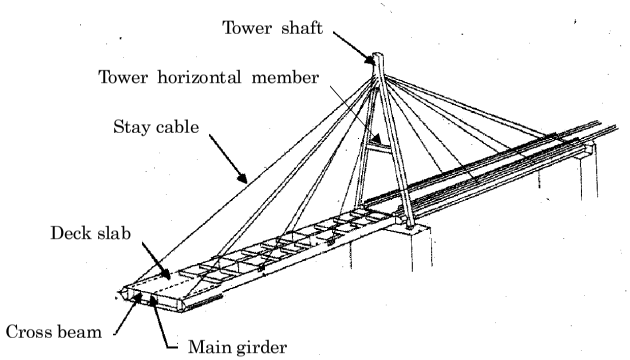
7. Cantilever Bridge with Hinge

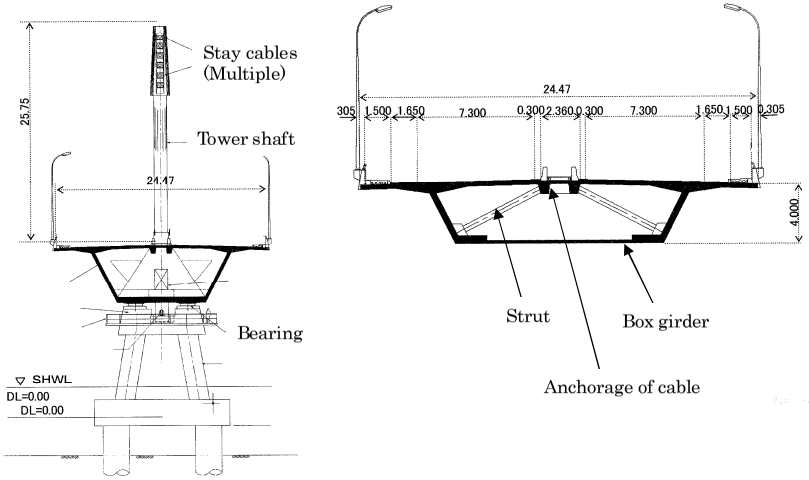


8. Rigid Frame Bridge



9.Cable- Stayed Bridge

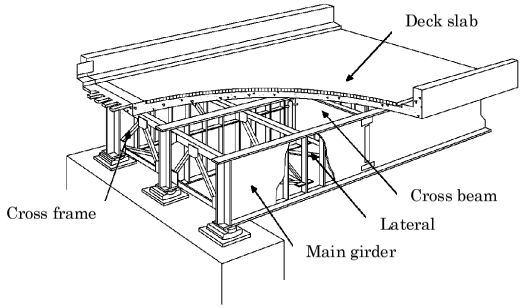




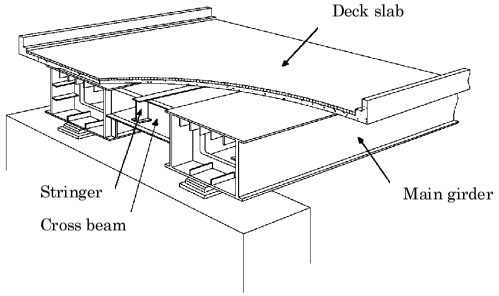
Section and elements of the 3rd Kamaphuli Bridge (Extradosed bridge)

< Steel Bridge >

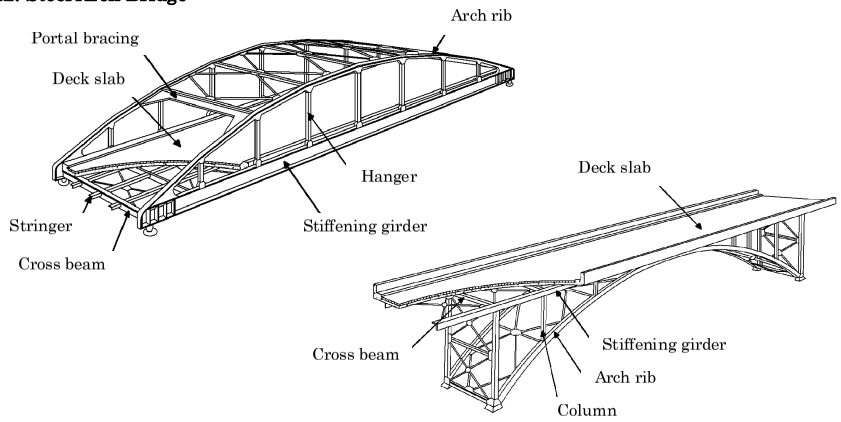
10. Steel Girder Bridge



11. Steel Box Girder Bridge



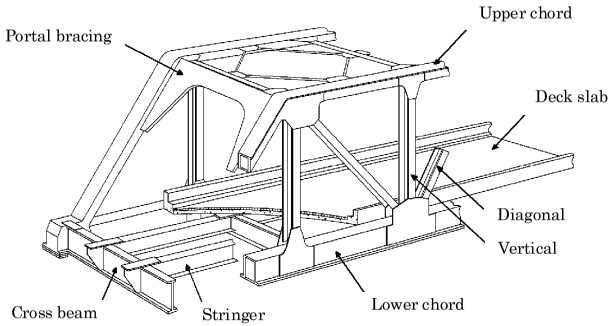
12. Steel Arch Bridge



13. Truss Bridge with Steel Deck

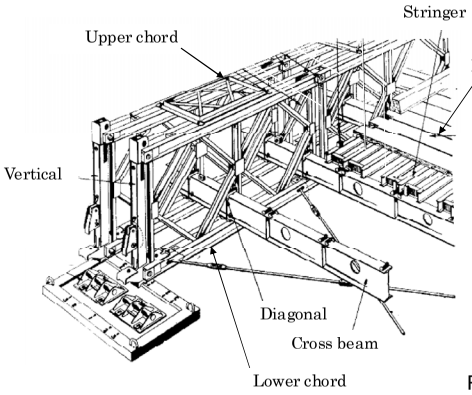
14. Truss Bridge with RC slab

15. Truss Bridge with Timber Deck



16. Portable Steel Bridge with Steel Deck

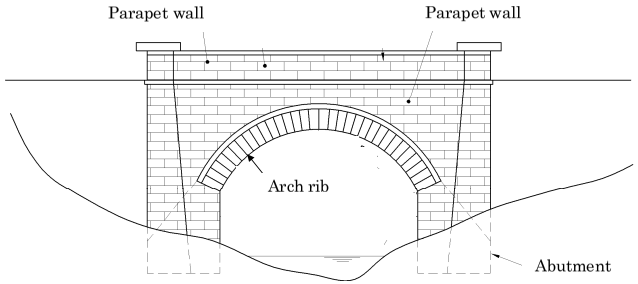
17. Portable Steel Bridge with Timber Deck



Rodal Tlki Portable Steel Bridge in Manikganj

< Masonry Arch Bridge >

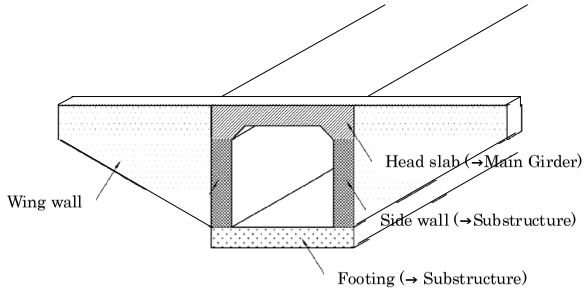
18. Masonry Arch Bridge



< Culvert >

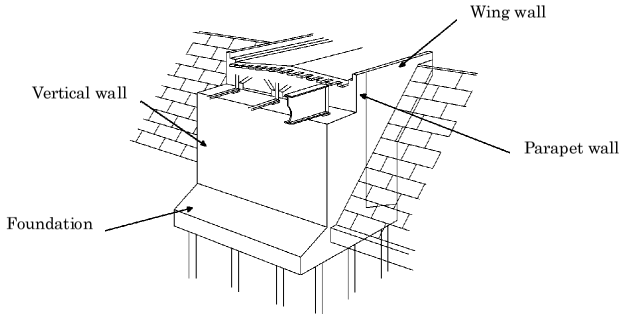
19. Box Culvert

A structure which is in a box form (single or multiple cell) in cross-section which contains a ground slab, and where the floor, walls and deck are of monolithic construction, i.e. there are no joints or bearings within the structural unit.

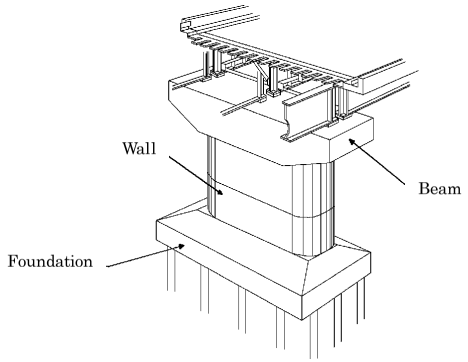


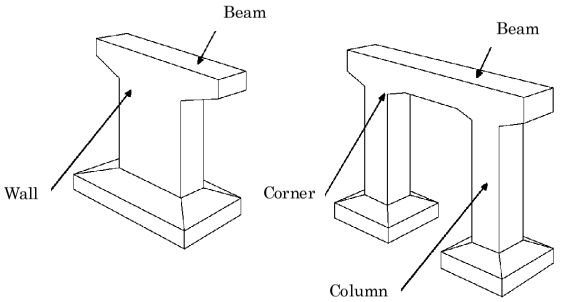
Substructure Type

<Abutment>

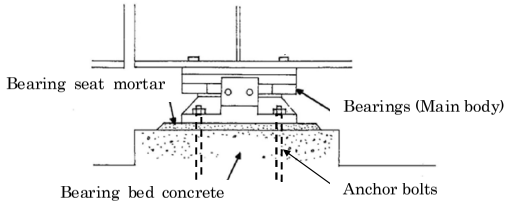


<Pier>



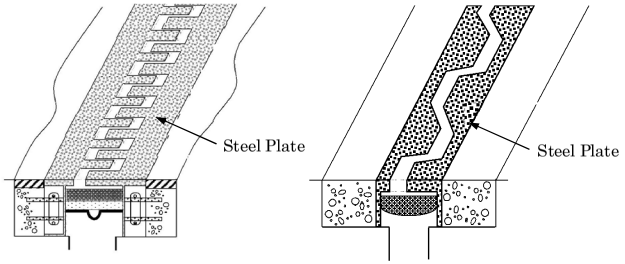


Bearings

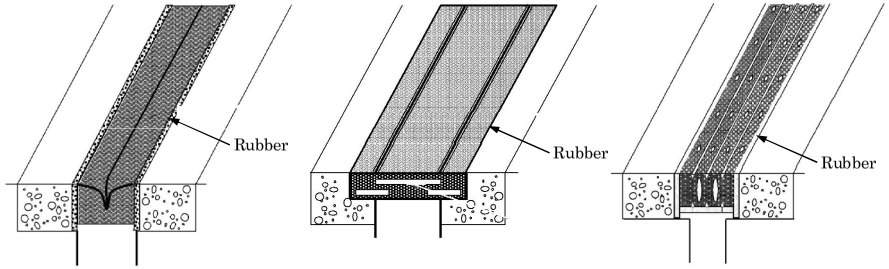


Expansion Joint

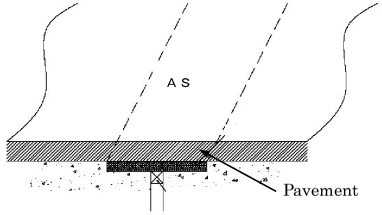
<Steel>



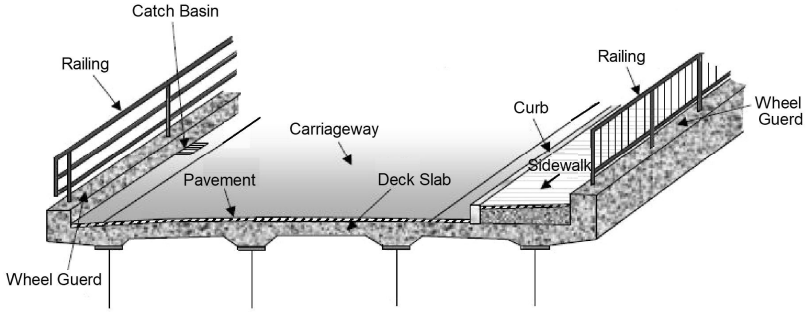
<Rubber>

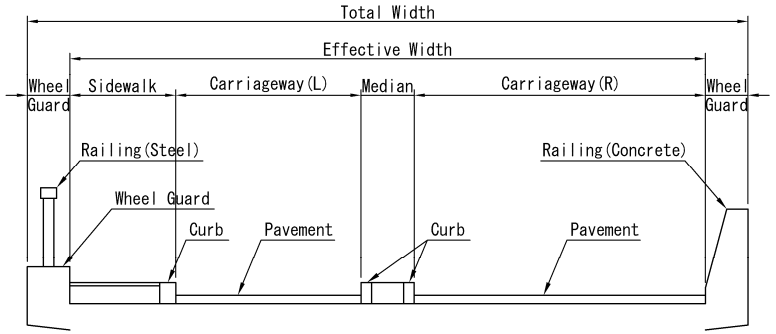


<Others>



Deck Surface





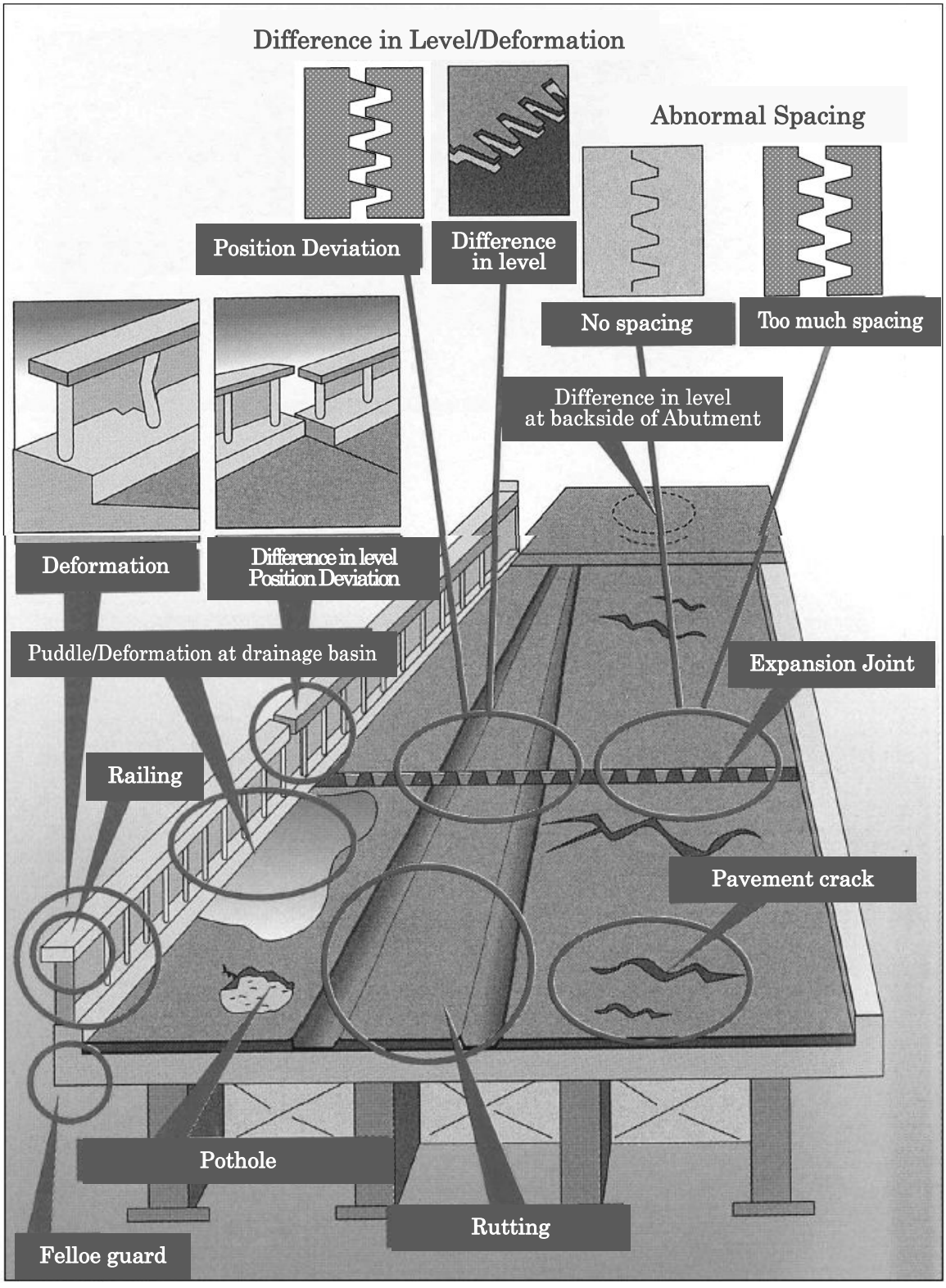


Figure Summary of Possible Defects and Locations

A P P E N D I X

RECORDING OF INVENTORY AND RESULT

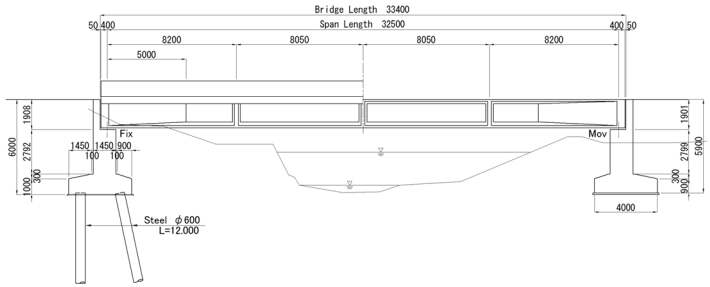
Periodic Inspection/Evaluation Report Form (Sample)

File Number	N1, 8b			Inspector			Date		
Zone	Dhaka	Circle	Dhaka	Division	Narayangnj-1		Sub-Division	Narayangnj-1	
District		Upazilla		Union			Village		
Road No.	N1	Road Name	Dhaka(Jatrabari)-Comilla-Chittagong-Taknaf		LRP Name	8b	GPS	Lat	23d-42'-7.5"
								Long	90d-30'-57.3"
Bridge Name	Yamato Bridge			LRP+Offset (m)	5+3976		Chainage (km)		8.976
Year of Construction	1972	Design Standard		Design Load	TL-20	Load Ristriction			(ton)
Feature Intersected	River		Owner	Public Utilities Carried	telephone line		Owner		
	Road		Owner		water		Owner		
	Railway		Owner						
Bridge Length	33.4	No. of Spans	1	Span Arrangement	33.4		Skew Angle (degree)		85

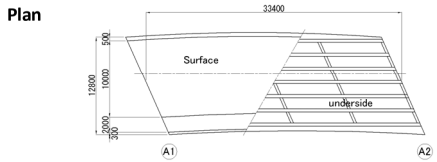
		Type	Material		Type	Material
Superstructure		PC Girder Br	Concrete	Deck Slab	RC	Concrete
Substructure	Abutment	Semi-Gravity type	Concrete	Foundation (Abutment)	Pile Foundation	Steel
	Pier	---		Foundation (Pier)	---	
Other Elements	Pavement	Asphalt		Bearings	Rubber	
	Expansion Joint	Steel		Railing	Others	

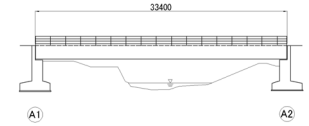
Width	Total Width	12.8 m	Wheel Guard-L	Sidewalk-L	Carriage way-L	Median	Carriage way-R	Sidewalk-R	Wheel Guard-R	
	Effective Width	12.0 m	0.5 m	0.0 m	5.5 m	4.5 m	2.0 m	0.3 m	0.0 m	
Traffic Conditions	Census (year)	2014				Heavy Vehicle Traffic Rate (%)		0~10・10~20・20~30・30~		
	Traffic Volume	10,500	Vehicles (Daytime 12 hours)			Condition Category for Entire Bridge		85	D	

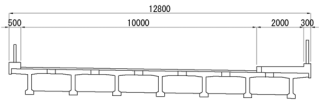
General View



General View of the Span







Aug 2018

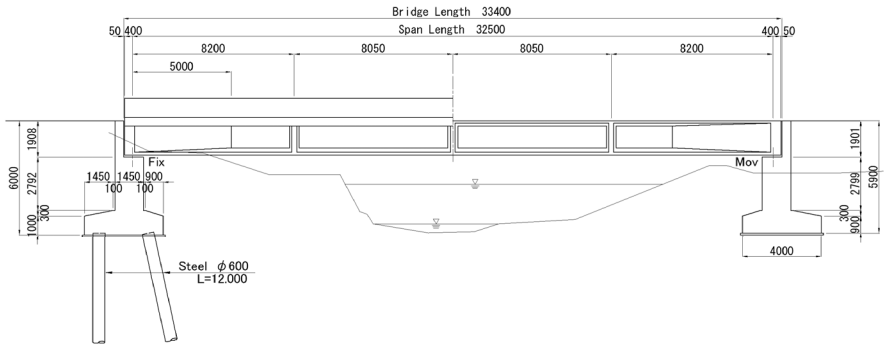
Page No.11 of Appendix

Sample of PC Bridge

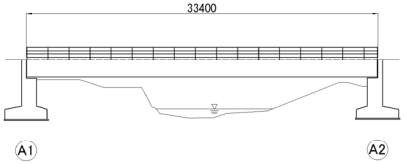
General Drawings

Bridge Number		Bridge Name	Yamato Bridge	Route Name	

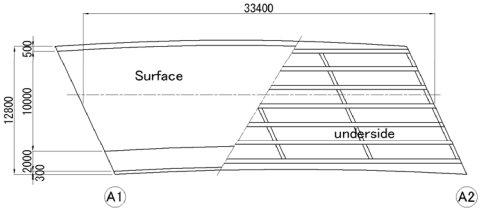
General View



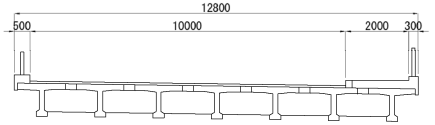
Side View



Plan



Cross Section



Overall View Photo

Bridge Number		Bridge Name	Yamato Bridge	Route Name	

Viewpoint	Side View
Date	

Viewpoint	Front View
Date	

Viewpoint	Under Bridge
Date	

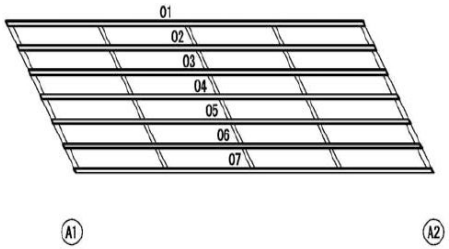
Sample of PC Bridge

Element Numbering System

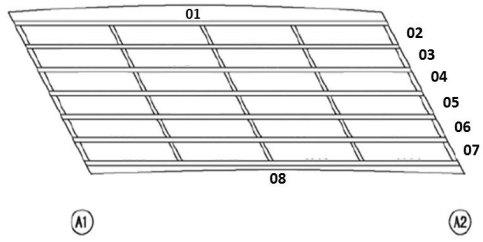
Bridge Number		Bridge Name	Yamato Bridge	Route Name	

Span No.	1

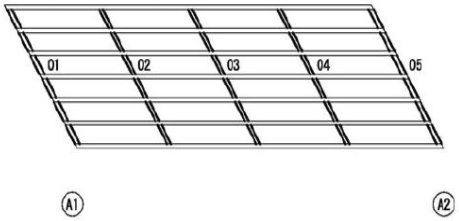
Main Girder (Mg)



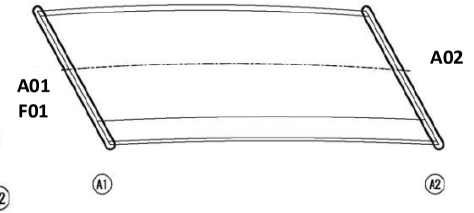
Deck Slab (Ds)



Cross Girder (Cr)

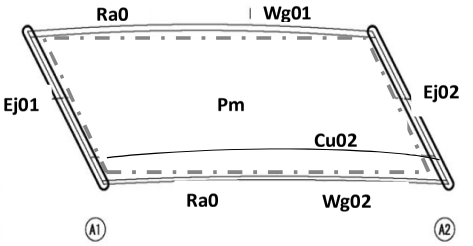


Substructure
Abutment (A), Foundation (F)



Bearings (Bh)

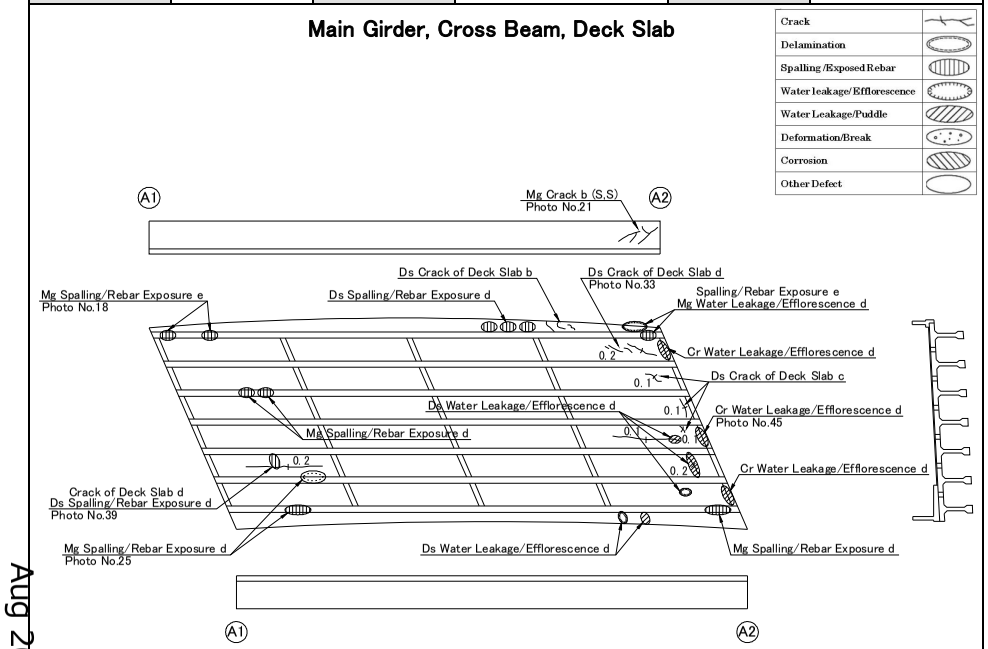
Railing (Ra), Wheel Guard (Wg)
Expansion Joint (Ej), Curb (Cb), Pavement (Pm)



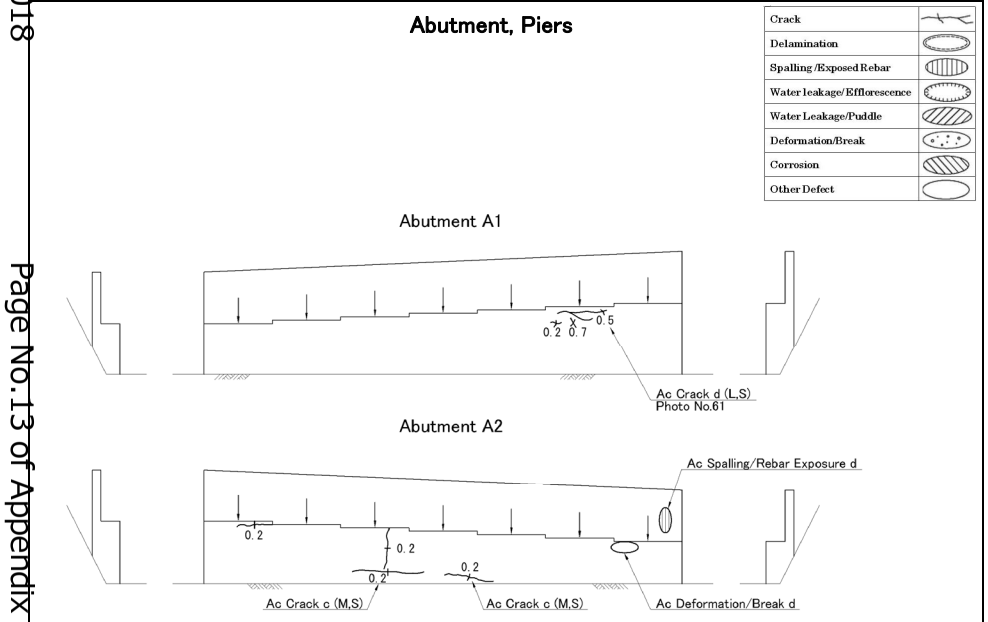
Defect Sketch

Bridge Number		Bridge Name	Yamato Bridge	Route Name	

Main Girder, Cross Beam, Deck Slab



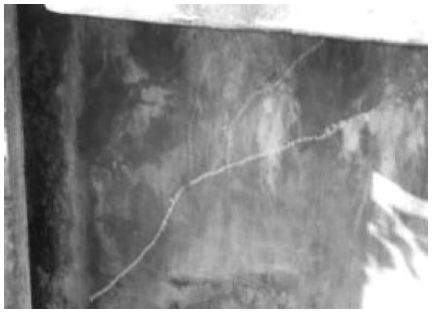
Abutment, Piers



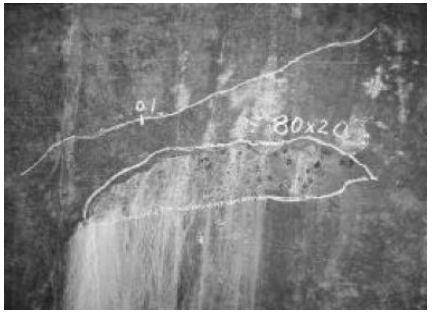
Defect Photos

Bridge Number		Bridge Name	Yamato Bridge	Route Name	

Span No.	1	Photo No.	18	Span No.	1	Photo No.	21
Element	Main Girder	Defect	Spalling/Rebar Exposure	Element	Main Girder	Defect	Crack
		Rating	e			Rating	b



Span No.	1	Photo No.	25	Span No.	1	Photo No.	45
Element	Main Girder	Defect	Spalling/Rebar Exposure	Element	Cross Beam	Defect	Leakage/Efflorescence
		Rating	d			Rating	d



Span No.	1	Photo No.	33	Span No.	1	Photo No.	39
Element	Deck Slab	Defect	Crack of Deck Slab	Element	Deck Slab	Defect	Spalling/Rebar Exposure
		Rating	d			Rating	d

Periodic Inspection Report Form

Inspector Date

File Number		Bridge Name	Yamato Bridge	Superstructure	.PC Girder Bridge	Year	1972
Zone		Circle		Division		Sub-Division	
Survey Result				No. of Hinge	0	Span Length	33.4 m	Span No.	1

Items of Defects		Steel Material					Concrete Material						Others				Common									Remarks
		Corrosion	Crack	Loose or Missing Bolts	Fracture	Deterioration of Paint System	Crack	Spalling/Exposed Rebar	Water Leakage/Efflorescence	Fallen out of Deck Slab	Crack of Deck Slab	Delamination	Abnormal Spacing	Difference in Level	Pavement Crack	Functional disorder of Bearings	Others	Defects of Reinforced Materials	Abnormal Anchorage	Discoloration/deterioration	Water Leakage /Puddle	Abnormal Noise/Vibration	Abnormal Deflection	Deformation/Break	Accumulation of Debris	Settlement/Tilt/Movement	Scour	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
Main Girder	01						b	e	c																			
Main Girder	02																											
Main Girder	03							d																				
Main Girder	04																											
Main Girder	05																											
Main Girder	06						b	c																				
Main Girder	07							d	d																			
Cross Beam	01								d																			
Cross Beam	02																											
Cross Beam	03																											
Cross Beam	04								d																			
Cross Beam	05																											
Cross Beam	06								d																			
Deck Slab (RC)	01							d			b																	
Deck Slab (RC)	02										d																	
Deck Slab (RC)	03										c																	
Deck Slab (RC)	04										c																	
Deck Slab (RC)	05								d		c																	
Deck Slab (RC)	06							d	d		d																	
Deck Slab (RC)	07								d																			
Deck Slab (RC)	08								d																			
Abutment	01						d	d																				
Abutment	02						c																	c				
Foundation (RC)	01																											
Foundation (RC)	02																											
Bearing	01	d																			e							
Bearing	02	d																			e							
Expansion Joint (Rubber)	01																				e							
Railing (Steel)	01																											
Wheel Gurad	01																							c				
Drainage System	01	c																							e			
Pavement	01													e														
Bridge Approaches	01																											
Bridge Approaches	02																											
Lighting Facility	01																											
Utility Pipe	01																							c				
Summary and Recommendation																												

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Bridge Evaluation Report Form

Evaluator Date

File Number		Bridge Name	Yamato Bridge	Superstructure	PC Girder Bridge	Year	1972
Zone		Circle		Division		Sub-Division	
Evaluation Result					Span No.	1	Page No.	1/3

Component	Element Type	Material	Type of Defects	At No Repair	Bt Minor Repair	Ct Major Repair	Dt Emer-gency	Public Safety	Detailed investi-gation	Remarks
Superstructure	Main Girder	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
	Main Truss	Concrete	6.Crack	✔						
	Main Arch		7.Spalling / Exposed Rebar			✔				
			8.Water leakage /Efflorescence		✔					
	Outer Cable		11.Delamination	✔						
	Main Tower	Others	12.Abnormal Spacing	✔						
			16.Other Types of Defects	✔						
	Arch Rib	Common	17.Defects of Reinforcing material	✔						
	Top Slab		18.Abnormal Anchorage	✔						
			19.Discolorlation / Deterioration	✔						
			20.Water Leakage / Puddle	✔						
			21.Abnormal Noise / Vibration	✔						
			22.Abnormal Deflection	✔						
	* Primary element		23.Deformation / Break	✔						
	Cross Beam	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
	Stringer	Concrete	6.Crack	✔						
			7.Spalling / Exposed Rebar	✔						
			8.Water leakage /Efflorescence		✔					
			11.Delamination	✔						
		Others	16.Other Types of Defects	✔						
		Common	17.Defects of Reinforcing material							
			18.Abnormal Anchorage	✔						
			19.Discolorlation / Deterioration	✔						
			21.Abnormal Noise / Vibration	✔						
			22.Abnormal Deflection							
	* Primary element		23.Deformation / Break	✔						
	Lateral Bracing	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Others	16.Other Types of Defects							
		Common	17.Defects of Reinforcing material							
			21.Abnormal Noise / Vibration							
	- Secondary element		23.Deformation / Break							
	Deck Slab	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Concrete	7.Spalling / Exposed Rebar		✔					
			8.Water leakage /Efflorescence		✔					
			9.Fallen out of Deck Slab	✔						
			10.Crack of Deck Slab			✔				
			11.Delamination	✔						
		Others	16.Other Types of Defects	✔						
		Common	17.Defects of Reinforcing material							
			18.Abnormal Anchorage	✔						
			19.Discolorlation / Deterioration	✔						
			20.Water Leakage / Puddle	✔						
	* Primary element		23.Deformation / Break	✔						

Bridge Evaluation Report Form

Evaluator: Date:

File Number		Bridge Name	Yamato Bridge	Superstructure	PC Girder Bridge	Year	1972
Zone		Circle		Division		Sub-Division	
Evaluation Result				Span No.	1	Page No.	2/3

Component	Element Type	Material	Type of Defects	At No Repair	Bt Minor Repair	Ct Major Repair	Dt Emergency	Public Safety	Detailed investigation	Remarks
Substructure	Abutment, Pier, Side Wall, Parapet Wall	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Concrete	6.Crack			✔				
			7.Spalling / Exposed Rebar		✔					
			8.Water leakage /Efflorescence	✔						
			11.Delamination	✔						
		Others	16.Other Types of Defects	✔						
		Common	17.Defects of Reinforcing material							
			19.Discolorlation / Deterioration	✔						
			20.Water Leakage / Puddle	✔						
			21.Abnormal Noise / Vibration							
	* Primary element		23.Deformation / Break	✔						
	Foundation, Footing	Steel	1.Corrosion							
			2.Crack in Steel							
			5.Deterioration of Paint System							
		Concrete	6.Crack	✔						
			7.Spalling / Exposed Rebar	✔						
		Others	16.Other Types of Defects	✔						
		Common	25.Settelment / Tilt / Movement	✔						
	* Primary element		26.Scouring	✔						
	Retaining Wall	Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
			8.Water leakage /Efflorescence							
			11.Delamination							
		Others	16.Other Types of Defects							
		Common	17.Defects of Reinforcing material							
			19.Discolorlation / Deterioration							
			23.Deformation / Break							
			25.Settelment / Tilt / Movement							
	- Secondary element		26.Scour							
Bearings	Bearing Main Body, Anchor Bolts	Steel (Rubber)	1.Corrosion			✔				
			2.Crack in Steel	✔						
			3.Loose or Missing Bolts	✔						
			4.Fracture	✔						
			5.Deterioration of Paint System	✔						
		Others	12.Abnormal Spacing	✔						
			15.Function Disorder of Bearings	✔						
			16.Other Types of Defects	✔						
		Common	20.Water Leakage / Puddle	✔						
			21.Abnormal Noise / Vibration	✔						
			23.Deformation / Break	✔						
			24.Accumulation of Debris	✔						
	* Primary element		25.Settelment / Tilt / Movement	✔						
	Bearing Seat Mortal, Bearing Bed concrete	Concrete	6.Crack	✔						
			7.Spalling / Exposed Rebar	✔						
			11.Delamination	✔						
		Others	16.Other Types of Defects	✔						
		Common	20.Water Leakage / Puddle		✔					
	* Primary element		23.Deformation / Break	✔						

Sample of PC Bridge

Bridge Evaluation Report Form

Evaluator: Date:

File Number		Bridge Name	Yamato Bridge	Superstructure	PC Girder Bridge	Year	1972
Zone		Circle		Division		Sub-Division	
Evaluation Result				Span No.	1	Page No.	3/3

Element Type	Material	Type of Defects	At No Repair	Bt Minor Repair	Ct Major Repair	Dt Emergency	Public Safety	Detailed investigation	Remarks
Pavement	Others	13.Differnce in Level			✔				
		14.Abnormal Bituminous Pavement	✔						
		16.Other Types of Defects	✔						
- Secondary element	Common	24.Accumulation of Debris	✔						
Bridge Approaches	Others	13.Differnce in Level	✔						
		14.Abnormal Bituminous Pavement	✔						
		16.Other Types of Defects	✔						
- Secondary element	Common	24.Accumulation of Debris	✔						
Expansion Joints (Rubber / Steel) > Including - elements of post-cast concrete	Steel (Rubber)	1.Corrosion	✔						
		2.Crack in Steel	✔						
		3.Loose or Missing Bolts	✔						
		4.Fracture	✔						
		5.Deterioration of Paint System	✔						
	Concrete	6.Crack							
		11.Delamination							
	Others	12.Abnormal Spacing	✔						
		13.Differnce in Level	✔						
		16.Other Types of Defects	✔						
	Common	20.Water Leakage / Puddle		✔					
		21.Abnormal Noise / Vibration	✔						
		23.Deformation / Break	✔						
- Secondary element		24.Accumulation of Debris	✔						
Railing (Steel / Concrete) Wheel Guard (Concrete) > Including - Guard Fence - Median - Curb	Steel	1.Corrosion	✔						
		2.Crack in Steel	✔						
		3.Loose or Missing Bolts	✔						
		4.Fracture	✔						
		5.Deterioration of Paint System	✔						
	Concrete	6.Crack							
		7.Spalling / Exposed Rebar							
		8.Water leakage /Efflorescence							
		11.Delamination							
	Others	16.Other Types of Defects	✔						
	Common	19.Discolorlation / Deterioration		✔					
- Secondary element		23.Deformation / Break	✔						
Drainage System > Including - Catch-Basin - Drainage Pipe	Steel Polyvinyl	1.Corrosion		✔					
		4.Fracture	✔						
		5.Deterioration of Paint System	✔						
	Others	16.Other Types of Defects	✔						
	Common	19.Discolorlation / Deterioration	✔						
		20.Water Leakage / Puddle	✔						
		23.Deformation / Break	✔						
- Secondary element		24.Accumulation of Debris		✔					
Lighting Facility Road Sign Facility	Steel	1.Corrosion	✔						
		2.Crack in Steel	✔						
		3.Loose or Missing Bolts	✔						
		4.Fracture	✔						
		5.Deterioration of Paint System	✔						
	Others	16.Other Types of Defects	✔						
	Common	19.Discolorlation / Deterioration	✔						
- Secondary element		23.Deformation / Break	✔						
Inspection Facility Utility Pipe	Steel	1.Corrosion	✔						
		2.Crack in Steel	✔						
		3.Loose or Missing Bolts	✔						
		4.Fracture	✔						
		5.Deterioration of Paint System	✔						
	Others	16.Other Types of Defects	✔						
	Common	21.Abnormal Noise / Vibration	✔						
- Secondary element		23.Deformation / Break		✔					

Periodic Inspection/Evaluation Report Form (Sample)

File Number				Inspector		Date	
Zone	Rajshahi	Circle	Pabna	Division	Sirajganj	Sub-Division	Sirajganj-1
District		Upazilla		Union		Village	
Road No.	R451	Road Name	Nalka-Sirajganj Road	LRP Name	LRP001	GPS	Lat 24d-25'-47" / Long 89d-36'-4"
Bridge Name	Naiori Bridge	LRP+Offset (m)				Chainage (km)	0.907
Year of Construction	1980	Design Standard		Design Load		Load Ristriction	(ton)
Feature Intersected	River	Owner		Public Utilities Carried	telephone line	Owner	
	Road	Owner			water	Owner	
	Railway	Owner					
Bridge Length	50.08	No. of Spans	2	Span Arrangement	25+25	Skew Angle (degree)	90

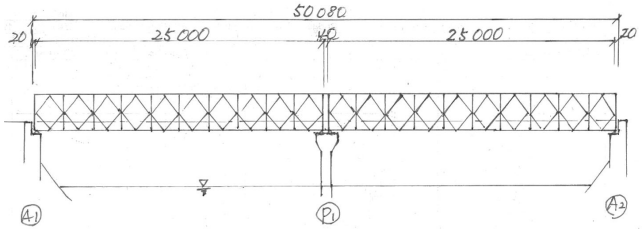
		Type	Material		Type	Material
Superstructure		Portable Steel Bridge with Steel Deck	Steel	Deck Slab	Steel	Steel
Substructure	Abutment	Inverted T-type	Concrete	Foundation (Abutment)	Piled	---
	Pier	Wall Type	Concrete	Foundation (Pier)	Piled	---
Other Elements	Pavement	None		Bearings	Steel	Steel
	Expansion Joint	None		Railing	None	

			Wheel Guard-L	Sidewalk-L	Carriage way-L	Median	Carriage way-R	Sidewalk-R	Wheel Guard-R
Width	Total Width	7.50 m							
	Effective Width	6.05 m	0.1 m	0.0 m	7.30 m	m	0.0 m	0.1 m	0.0 m

Traffic Conditions	Census (year)	Heavy Vehicle Traffic Rate (%)	0~10 ・10~20 ・20~30 ・30~
	Traffic Volume Vehicles (Daytime 12 hours)	Condition Category for Entire Bridge	35 B

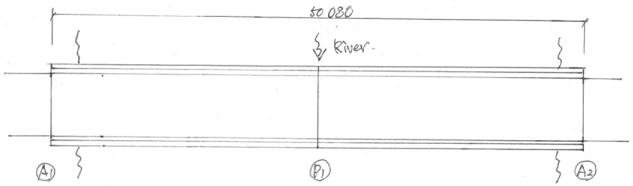
General View

Side View

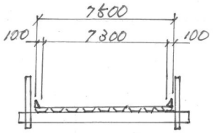


General View of the Span

Plan



Cross Section



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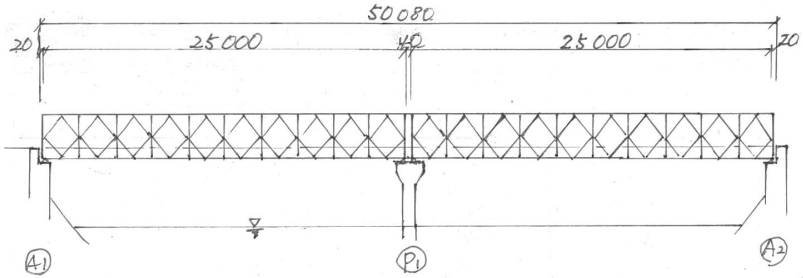
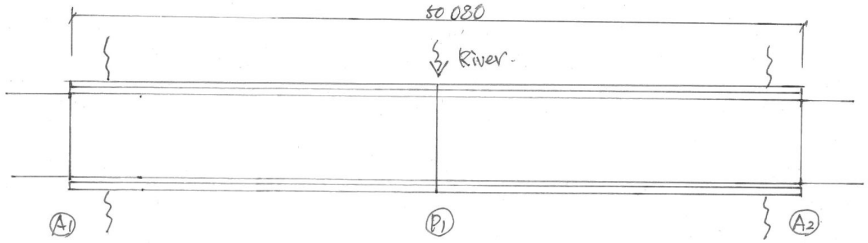
General Drawings

Bridge Number		Bridge Name	Naiori Bridge	Route Name	

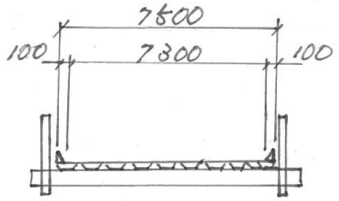
General View



Plan



Cross Section



Overall View Photo

Bridge Number		Bridge Name	Naiori Bridge	Route Name	

Viewpoint	Side View
Date	23.08.15

Viewpoint	Front View
Date	23.08.15

Viewpoint	Under Bridge
Date	23.08.15

Sample of PSB

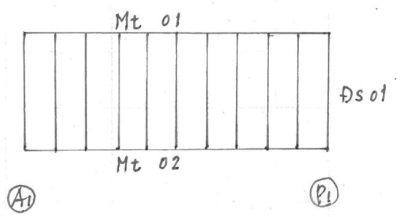
Element Numbering System

Bridge Number		Bridge Name	Naiori Bridge	Route Name	

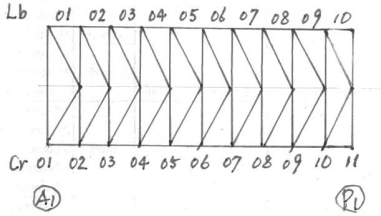
Span No.	1

Main Truss (Mt)

Deck Slab (Ds)

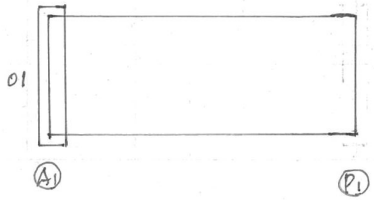


Cross Beam (Cb), Lateral Bracing (Rb)

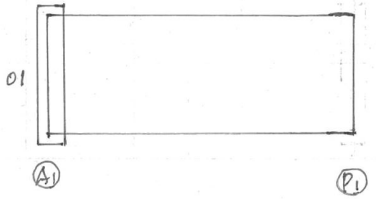


Substructure

Abutment(A) ,Foundation(F)

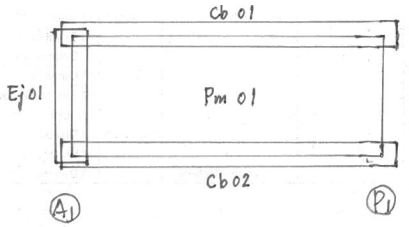


Bearing(Br)



Curb(Cb)

Expansion Joint (Ej), Pavement (Pm)

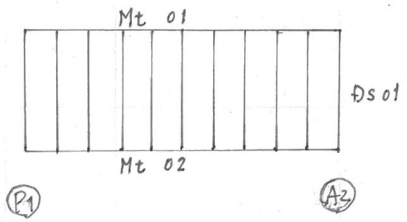


Element Numbering System

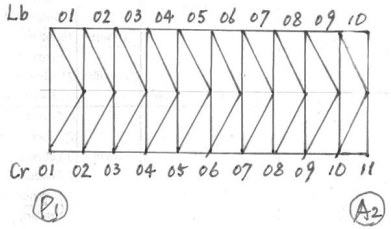
Bridge Number		Bridge Name	Naiori Bridge	Route Name		Span No.	2

Main Truss (Mt)

Deck Slab (Ds)

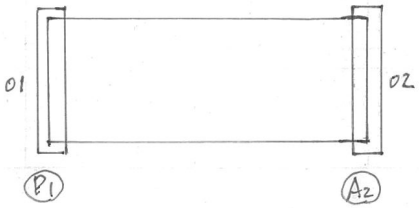


Cross Beam (Cb), Lateral Bracing (Rb)

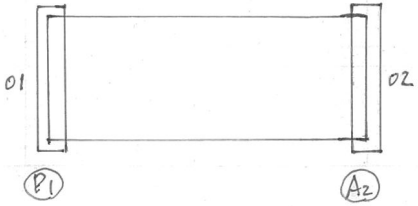


Substructure

Abutment(A) ,Pire(P), Foundation(F)

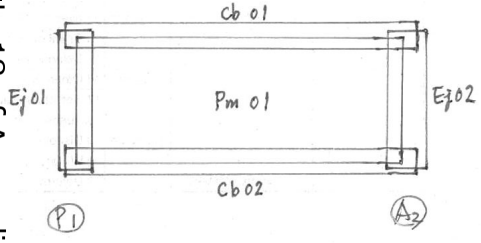


Bearing(Br)



Curb(Cb)

Expansion Joint (Ej), Pavement (Pm)



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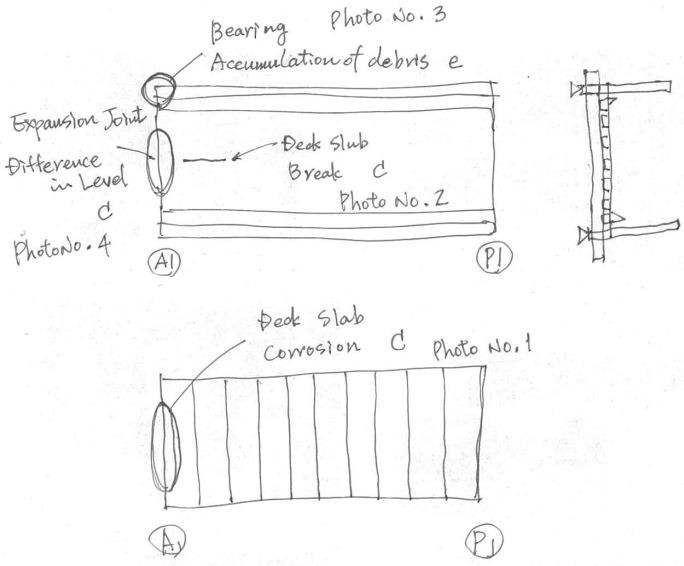
Sample of PSB

Defect Sketch

Bridge Number		Bridge Name	Naiori Bridge	Route Name	



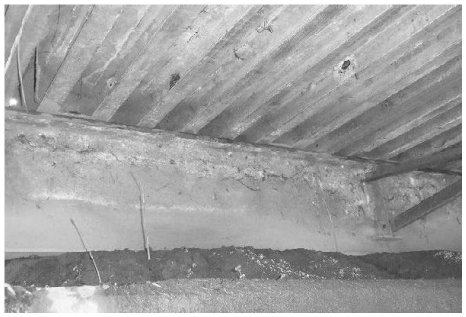
Crack
Delamination
Spalling /Exposed Rebar
Water leakage/Efflorescence
Water Leakage/Puddle
Deformation/Break
Corrosion
Other Defect

Crack
Delamination
Spalling /Exposed Rebar
Water leakage/Efflorescence
Water Leakage/Puddle
Deformation/Break
Corrosion
Other Defect

Defects Photos

Bridge Number		Bridge Name	Naiori Bridge	Route Name	

Span No.	1	Photo No.	1	Span No.	1	Photo No.	2
Element	Deck Slab	Defect	Corrosion	Element	Deck Slab	Defect	Break
		Rating	C			Rating	C



Span No.	1	Photo No.	3	Span No.	1	Photo No.	4
Element	Bearing	Defect	Accumulation of debris	Element	Expansion Joint	Defect	Difference in Level
		Rating	e			Rating	C

Span No.		Photo No.		Span No.		Photo No.	
Element		Defect		Element		Defect	
		Rating				Rating	

Sample of PSB

Periodic Inspection Report Form

Inspector HARAZAKI, Ikuo Date 23.08.15

File Number		Bridge Name	Naiori Bridge	Superstructure	PSB with Steel Deck	Year	1980
Zone	Rajshahi	Circle	Pabna	Division	Sirajganj	Sub-Division	Sirajganj-1
Survey Result				No. of Hinge	0	Span Length	25.0	Span No.	1

Items of Defects		Steel Material					Concrete Material						Others				Common									Remarks
		Corrosion	Crack	Loose or Missing Bolts	Fracture	Deterioration of Paint System	Crack	Spalling/Exposed Rebar	Water Leakage/Efflorescence	Fallen-out of Deck Slab	Crack of Deck Slab	Delamination	Abnormal Spacing	Difference in Level	Abnormal Bituminous Pavement	Functional disorder of Bearings	Others	Defects of Reinforced Materials	Abnormal Anchorage	Discoloration/deterioration	Water Leakage /Puddle	Abnormal Noise/Vibration	Abnormal Deflection	Deformation/Break	Accumulation of Debris	Settlement/Tilt/Movement	Scour	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
Main Truss	01																											
Main Truss	02																											
Cross Beam	01																											
Cross Beam	02																											
Cross Beam	03																											
Cross Beam	04																											
Cross Beam	05																											
Cross Beam	06																											
Cross Beam	07																											
Cross Beam	08																											
Cross Beam	09																											
Cross Beam	10																											
Cross Beam	11																											
Lateral Bracing	01																											
Lateral Bracing	01																											
Lateral Bracing	02																											
Lateral Bracing	03																											
Lateral Bracing	04																											
Lateral Bracing	05																											
Lateral Bracing	06																											
Lateral Bracing	07																											
Lateral Bracing	08																											
Lateral Bracing	09																											
Lateral Bracing	10																											
Deck Slab (Steel)	01	C																						C				
Abutment / Pier (RC)	01																											
Foundation (RC)	01																											
Retaining Wall	01																											
Bearing	01																								e			
Expansion Joint (Steel)	01													C														
Curb	01																											
Pavement	01																											
Bridge Approaches	01																											
Summary Recommendation																												

Bridge Evaluation Report Form

					Evaluator	KONISHI, Toshiyuki		Date	23.08.15				
File Number		Bridge Name	Naiori Bridge	Superstructure	PSB with Steel Deck		Year	1980					
Zone	Rajshahi	Circle	Pabna	Division	Sirajganj		Sub-Division	Sirajganj-1					
Evaluation Result					Span No.	1	Page No.	1/3					

Component	Element Type	Material	Type of Defects	At No Repair	Bt Minor Repair	Ct Major Repair	Dt Emer-gency	Public Safety	Detailed investi-gation	Remarks
Superstructure	Main Girder Main Truss Main Arch Outer Cable Main Tower Arch Rib Top Slab * Primary element	Steel	1.Corrosion	✔						
			2.Crack in Steel	✔						
			3.Loose or Missing Bolts	✔						
			4.Fracture	✔						
			5.Deterioration of Paint System	✔						
		Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
			8.Water leakage /Efflorescence							
			11.Delamination							
		Others	12.Abnormal Spacing	✔						
			16.Other Types of Defects	✔						
		Common	17.Defects of Reinforcing material	✔						
			18.Abnormal Anchorage							
			19.Discolorlation / Deterioration							
			20.Water Leakage / Puddle	✔						
			21.Abnormal Noise / Vibration	✔						
			22.Abnormal Deflection	✔						
			23.Deformation / Break	✔						
	Cross Beam Stringer * Primary element	Steel	1.Corrosion	✔						
			2.Crack in Steel	✔						
			3.Loose or Missing Bolts	✔						
			4.Fracture	✔						
			5.Deterioration of Paint System	✔						
		Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
			8.Water leakage /Efflorescence							
			11.Delamination							
		Others	16.Other Types of Defects	✔						
		Common	17.Defects of Reinforcing material	✔						
			18.Abnormal Anchorage							
			19.Discolorlation / Deterioration							
			21.Abnormal Noise / Vibration	✔						
			22.Abnormal Deflection							
			23.Deformation / Break	✔						
	Lateral Bracing - Secondary element	Steel	1.Corrosion	✔						
			2.Crack in Steel	✔						
			3.Loose or Missing Bolts	✔						
			4.Fracture	✔						
			5.Deterioration of Paint System	✔						
		Others	16.Other Types of Defects	✔						
		Common	17.Defects of Reinforcing material	✔						
			21.Abnormal Noise / Vibration	✔						
			23.Deformation / Break	✔						
	Deck Slab * Primary element	Steel	1.Corrosion		✔					
			2.Crack in Steel	✔						
			3.Loose or Missing Bolts	✔						
			4.Fracture	✔						
			5.Deterioration of Paint System	✔						
		Concrete	7.Spalling / Exposed Rebar							
			8.Water leakage /Efflorescence							
			9.Fallen out of Deck Slab							
			10.Crack of Deck Slab							
			11.Delamination							
		Others	16.Other Types of Defects	✔						
		Common	17.Defects of Reinforcing material	✔						
			18.Abnormal Anchorage							
			19.Discolorlation / Deterioration							
			20.Water Leakage / Puddle	✔						
			23.Deformation / Break		✔					

Sample of PSB

Bridge Evaluation Report Form

					Evaluator	KONISHI, Toshiyuki		Date	23.08.15				
File Number		Bridge Name	Naiori Bridge	Superstructure	PSB with Steel Deck		Year	1980					
Zone	Rajshahi	Circle	Pabna	Division	Sirajganj		Sub-Division	Sirajganj-1					
Evaluation Result					Span No.	1	Page No.	2/3					

Component	Element Type	Material	Type of Defects	At No Repair	Bt Minor Repair	Ct Major Repair	Dt Emer-gency	Public Safety	Detailed investi-gation	Remarks
Substructure	Abutment Pier Side Wall Parapet Wall * Primary element	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
			8.Water leakage /Efflorescence							
			11.Delamination							
		Others	16.Other Types of Defects							
		Common	17.Defects of Reinforcing material							
			19.Discolorlation / Deterioration							
			20.Water Leakage / Puddle							
			21.Abnormal Noise / Vibration							
			23.Deformation / Break							
	Foundation Footing * Primary element	Steel	1.Corrosion							
			2.Crack in Steel							
			5.Deterioration of Paint System							
		Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
		Others	16.Other Types of Defects							
		Common	25.Settelment / Tilt / Movement							
			26.Scouring							
	Retaining Wall - Secondary element	Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
			8.Water leakage /Efflorescence							
			11.Delamination							
		Others	16.Other Types of Defects							
		Common	17.Defects of Reinforcing material							
			19.Discolorlation / Deterioration							
			23.Deformation / Break							
			25.Settelment / Tilt / Movement							
			26.Scour							
Bearings	Bearing Main Body Anchor Bolts * Primary element	Steel (Rubber)	1.Corrosion	✔						
			2.Crack in Steel	✔						
			3.Loose or Missing Bolts	✔						
			4.Fracture	✔						
			5.Deterioration of Paint System	✔						
		Others	12.Abnormal Spacing	✔						
			15.Function Disorder of Bearings	✔						
			16.Other Types of Defects	✔						
		Common	20.Water Leakage / Puddle	✔						
			21.Abnormal Noise / Vibration	✔						
			23.Deformation / Break	✔						
			24.Accumulation of Debris		✔					
			25.Settelment / Tilt / Movement	✔						
	Bearing Seat Mortal Bearing Bed concrete * Primary element	Concrete	6.Crack	✔						
			7.Spalling / Exposed Rebar	✔						
			11.Delamination	✔						
		Others	16.Other Types of Defects	✔						
		Common	20.Water Leakage / Puddle	✔						
			23.Deformation / Break	✔						

Bridge Evaluation Report Form

				Evaluator	KONISHI, Toshiyuki		Date	23.08.15			
File Number		Bridge Name	Naiori Bridge	Superstructure	PSB with Steel Deck		Year	1980			
Zone	Rajshahi	Circle	Pabna	Division	Sirajganj		Sub-Division	Sirajganj-1			
Evaluation Result					Span No.	1	Page No.	3/3			

Element Type	Material	Type of Defects	At No Repair	Bt Minor Repair	Ct Major Repair	Dt Emergency	Public Safety	Detailed investigation	Remarks
Pavement	Others	13.Differnce in Level							
		14.Abnormal Bituminous Pavement							
		16.Other Types of Defects							
- Secondary element	Common	24.Accumulation of Debris							
Bridge Approaches	Others	13.Differnce in Level							
		14.Abnormal Bituminous Pavement							
		16.Other Types of Defects							
- Secondary element	Common	24.Accumulation of Debris							
Expansion Joints (Rubber / Steel)	Steel (Rubber)	1.Corrosion							
> Including		2.Crack in Steel							
- elements of post-cast concrete		3.Loose or Missing Bolts							
		4.Fracture							
		5.Deterioration of Paint System							
	Concrete	6.Crack							
		11.Delamination							
	Others	12.Abnormal Spacing	✔						
		13.Differnce in Level		✔					
		16.Other Types of Defects	✔						
	Common	20.Water Leakage / Puddle							
		21.Abnormal Noise / Vibration							
		23.Deformation / Break							
- Secondary element		24.Accumulation of Debris							
Railing (Steel / Concrete)	Steel	1.Corrosion							
Wheel Guard (Concrete)		2.Crack in Steel							
> Including		3.Loose or Missing Bolts							
- Guard Fence		4.Fracture							
- Median		5.Deterioration of Paint System							
- Curb	Concrete	6.Crack							
		7.Spalling / Exposed Rebar							
		8.Water leakage /Efflorescence							
		11.Delamination							
	Others	16.Other Types of Defects							
	Common	19.Discolorlation / Deterioration							
- Secondary element		23.Deformation / Break							
Drainage System	Steel Polyvinyl	1.Corrosion							
> Including		4.Fracture							
- Catch-Basin		5.Deterioration of Paint System							
- Drainage Pipe	Others	16.Other Types of Defects							
	Common	19.Discolorlation / Deterioration							
		20.Water Leakage / Puddle							
		23.Deformation / Break							
- Secondary element		24.Accumulation of Debris							
Lighting Facility	Steel	1.Corrosion							
Road Sign Facility		2.Crack in Steel							
		3.Loose or Missing Bolts							
		4.Fracture							
		5.Deterioration of Paint System							
	Others	16.Other Types of Defects							
	Common	19.Discolorlation / Deterioration							
- Secondary element		23.Deformation / Break							
Inspection Facility	Steel	1.Corrosion							
Utilitiy Pipe		2.Crack in Steel							
		3.Loose or Missing Bolts							
		4.Fracture							
		5.Deterioration of Paint System							
	Others	16.Other Types of Defects							
	Common	21.Abnormal Noise / Vibration							
- Secondary element		23.Deformation / Break							

Periodic Inspection/Evaluation Report Form (Sample)

File Number	N5-LRP036--00011130			Inspector		Date	
Zone	Dhaka	Circle	Dhaka	Division	Manikganj	Sub-Division	Nayarhat
District	-	Upazilla	-	Union	-	Village	-
Road No.	N5	Road Name	Dhaka(Mirpur)-Utholi-Paturia	LRP Name	LRP036	GPS Lat	23.91889
						GPS Long	90.12111
Bridge Name	Sreerampur Box Culvert			LRP+Offset (m)	0.679	Chainage (km)	36.679
Year of Construction	1998	Design Standard	-	Design Load	-	Load Ristriction	- (ton)

Feature Intersected		Owner	Public Utilities Carried		Owner
	River	Owner		telephone line	Owner
	Road	Owner		water	Owner
	Railway	Owner			

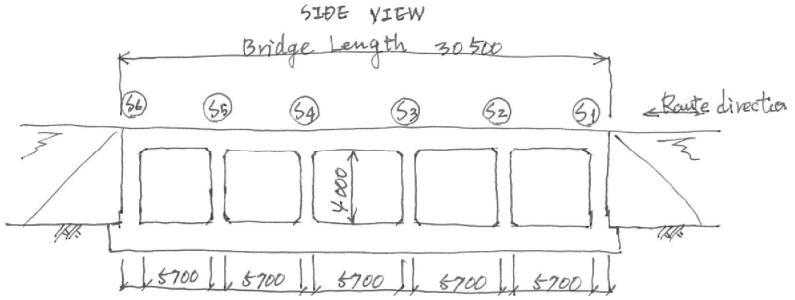
Bridge Length	30.500	No. of Spans	5	Span Arrangement	5.700+5.700+5.700+5.700+5.700	Skew Angle (degree)	90

		Type	Material		Type	Material
Superstructure		Box Culvert	Concrete	Deck Slab	RC	Concrete
Substructure	Abutment		Concrete	Foundation (Abutment)	Piled	Concrete
	Pier	Wall	Concrete	Foundation (Pier)	Piled	Concrete
Other Elements	Pavement	Asphalt		Bearings	None	
	Expansion Joint	None		Railing	Steel	

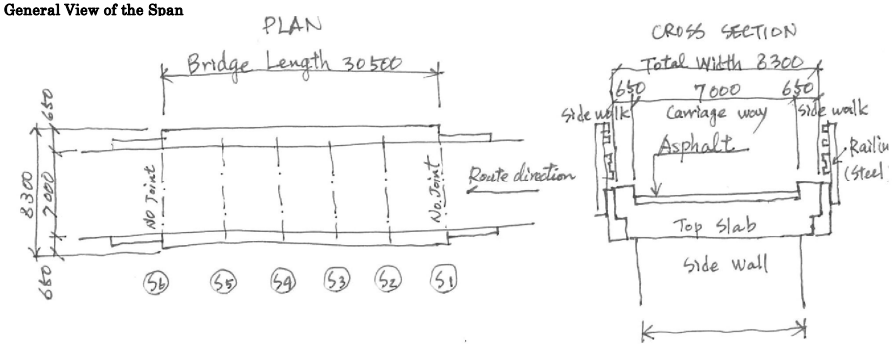
Width			Wheel Guard-L	Sidewalk-L	Carriage way-L	Median	Carriage way-R	Sidewalk-R	Wheel Guard-R
	Total Width	8.30 m							
	Effective Width	7.00 m	0.0 m	0.65 m	7.00 m	0.0 m	0.65 m	0.0 m	0.0 m

Traffic Conditions	Census (year)		Heavy Vehicle Traffic Rate (%)	0~10 ・10~20 ・20~30 ・30~
	Traffic Volume	Vehicles (Daytime 12 hours)	Condition Category for Entire Bridge	

General View



General View of the Span

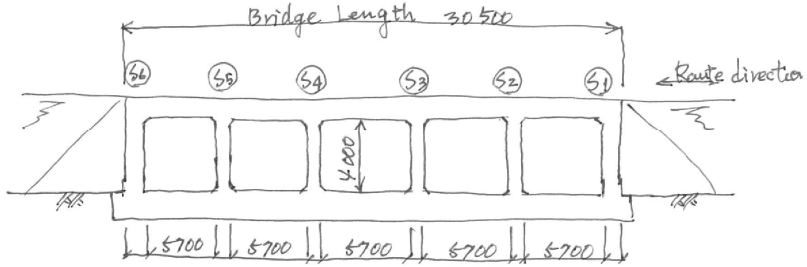


Sample of Box Culvert

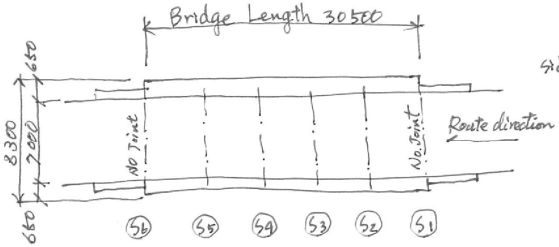
General Drawings

Bridge Number		Bridge Name	Sreerampur BoxCulvert	Route Name	

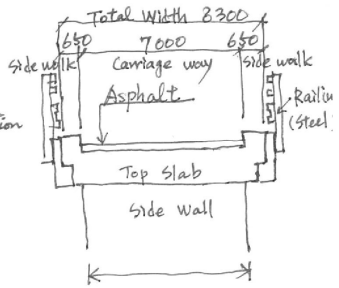
General View



Plan



Cross Section



Overall View Photo

Bridge Number		Bridge Name	Sreerampur BoxCulvert	Route Name	

Viewpoint	Side View
Date	19/07/17

Viewpoint	Front View
Date	19/07/17

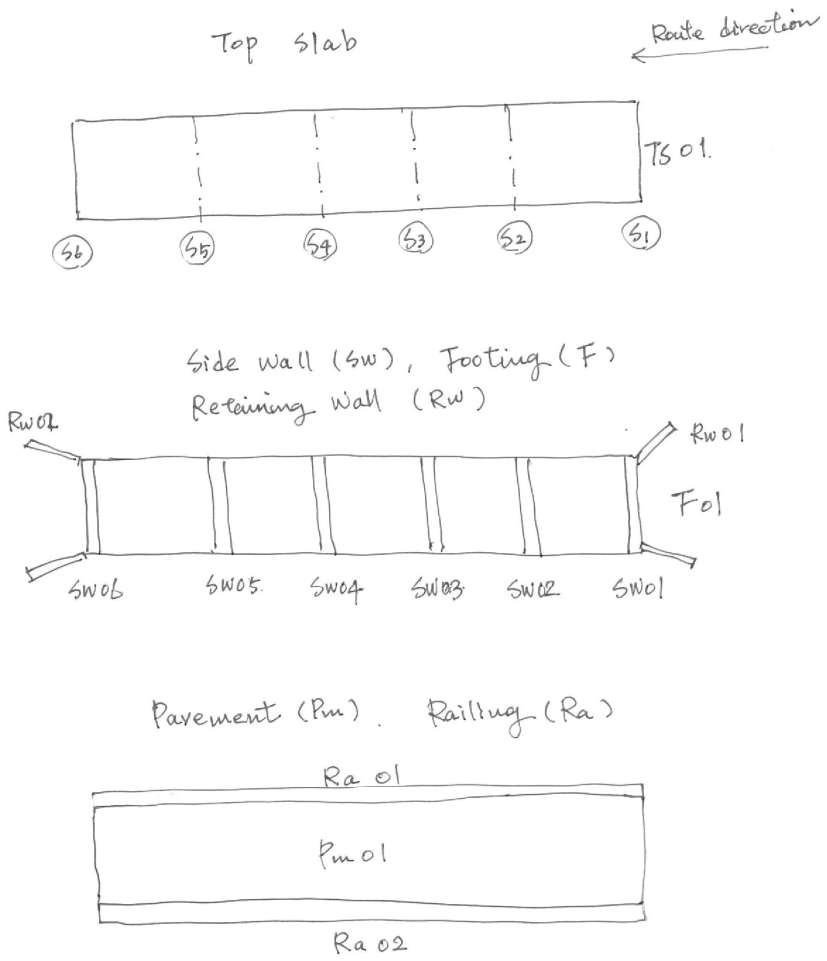
Viewpoint	Under Bridge
Date	19/07/17

Sample of Box Culvert

Element Numbering System

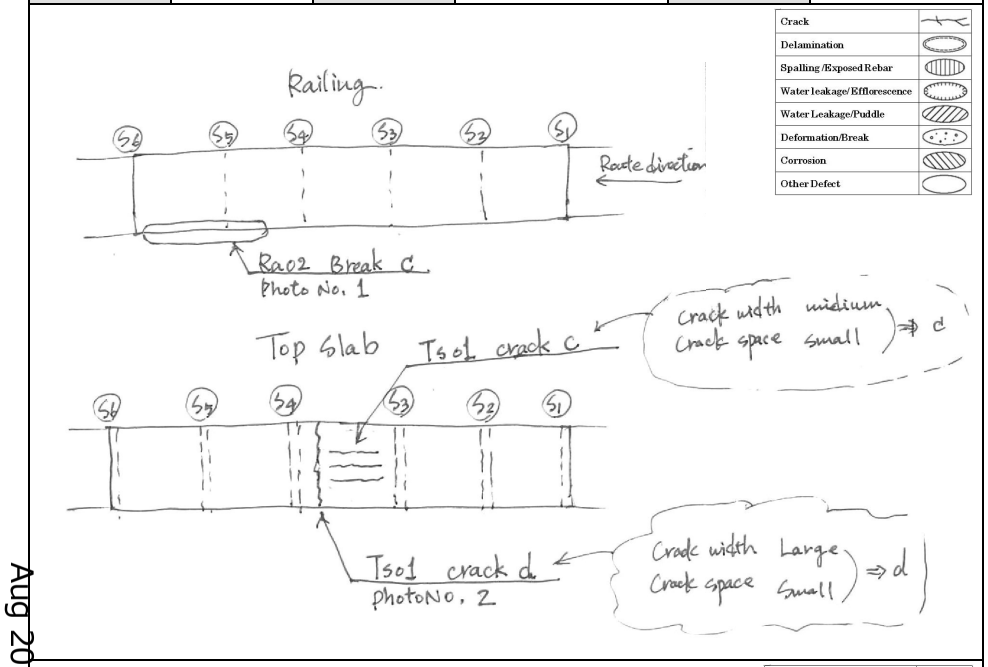
Bridge Number		Bridge Name	Sreerampur BoxCulvert	Route Name	

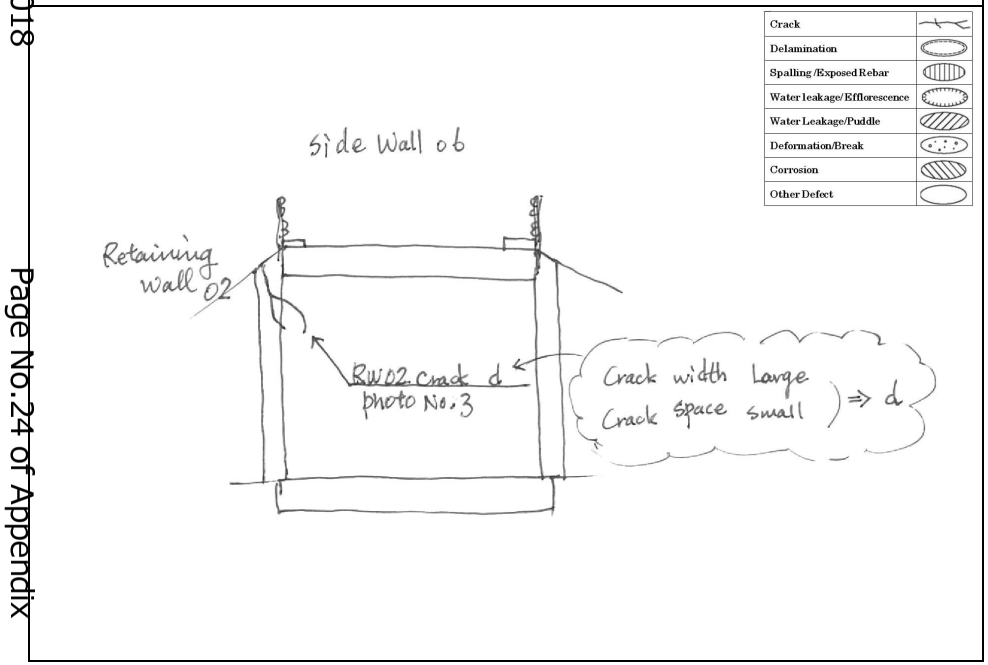
Span No.	



Defect Sketch

Bridge Number		Bridge Name	Sreerampur BoxCulvert	Route Name	



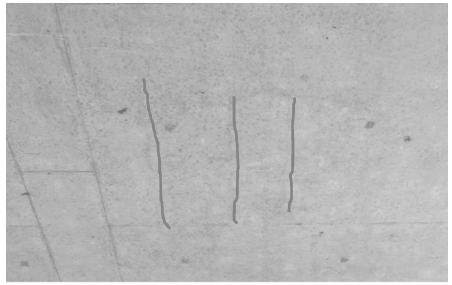


Defects Photos

Bridge Number		Bridge Name	Sreerampur BoxCulvert	Route Name	

Span No.	6	Photo No.	1	Span No.		Photo No.	
Element	Railing	Defect	Break	Element		Defect	
		Rating	c			Rating	

Span No.	3	Photo No.	2	Span No.	3	Photo No.	
Element	Top Slub	Defect	Crack	Element	Top Slub	Defect	Crack
		Rating	d			Rating	c



Span No.	6	Photo No.	3	Span No.		Photo No.	
Element	Retaining Wall	Defect	Crack	Element		Defect	
		Rating	d			Rating	

Periodic Inspection Report Form

Inspector Date 19/07/17

File Number		Bridge Name	Sreerampur BoxCulvert	Superstructure	Box Culvert	Year	1998
Zone	Dhaka	Circle	Dhaka	Division	Manikganj	Sub-Division	Nayarhat
Survey Result		No. of Hinge	0	Span Length	5.70	Span No.	

Items of Defects		Steel Material					Concrete Material						Others					Common									
		Corrosion	Crack	Loose or Missing Bolts	Fracture	Deterioration of Paint System	Crack	Spalling/Exposed Rebar	Water Leakage/Efflorescence	Fallen-out of Deck Slab	Crack of Deck Slab	Delamination	Abnormal Spacing	Difference in Level	Abnomal Bituminous Pavement	Functional disorder of Bearings	Others	Defects of Reinforced Materials	Abnormal Anchorage	Discoloration/deterioration	Water Leakage /Puddle	Abnormal Noise/Vibration	Abnormal Deflection	Deformation/Break	Accumulation of Debris	Settlement/Tilt/Movement	Scour
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Top Slab	01						d																				
Side Wall	01																										
Side Wall	02																										
Footing	01																										
Retaining Wall	01																										
Retaining Wall	02						d																				
Railing (Steel)	01																										
Railing (Steel)	02																							c			
Pavement	01																										
Summary																											
Recommendation																											

Aug 2018

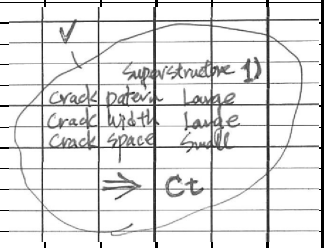
Page No.25 of Appendix

Bridge Evaluation Report Form

Evaluator Date 19/07/17

File Number		Bridge Name	Nagamachi Bridge	Superstructure	Box Culvert	Year	1938
Zone		Circle		Division		Sub-Division	
Evaluation Result					Span No.		Page No. 1/3

Component	Element Type	Material	Type of Defects	At No Repair	Bt Minor Repair	Ct Major Repair	Dt Emer-gency	Public Safety	Detailed investi-gation	Remarks
Superstructure	Main Girder Main Truss Main Arch Outer Cable Main Tower Arch Rib Top Slab * Primary element	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
			8.Water leakage /Efflorescence							
			11.Delamination							
		Others	12.Abnormal Spacing							
			16.Other Types of Defects							
		Common	17.Defects of Reinforcing material							
			18.Abnornal Anchorage							
			19.Discolorlation / Deterioration							
			20.Water Leakage / Puddle							
			21.Abnormal Noise / Vibration							
			22.Abnormal Deflection							
			23.Deformation / Break							
	Cross Beam Stringer * Primary element	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
			8.Water leakage /Efflorescence							
			11.Delamination							
		Others	16.Other Types of Defects							
		Common	17.Defects of Reinforcing material							
			18.Abnornal Anchorage							
			19.Discolorlation / Deterioration							
			21.Abnormal Noise / Vibration							
			22.Abnormal Deflection							
			23.Deformation / Break							
	Lateral Bracing - Secondary element	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Others	16.Other Types of Defects							
		Common	17.Defects of Reinforcing material							
			21.Abnormal Noise / Vibration							
			23.Deformation / Break							
	Deck Slab * Primary element	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Concrete	7.Spalling / Exposed Rebar							
			8.Water leakage /Efflorescence							
			9.Fallen out of Deck Slab							
			10.Crack of Deck Slab							
			11.Delamination							
		Others	16.Other Types of Defects							
		Common	17.Defects of Reinforcing material							
			18.Abnornal Anchorage							
			19.Discolorlation / Deterioration							
			20.Water Leakage / Puddle							
			23.Deformation / Break							

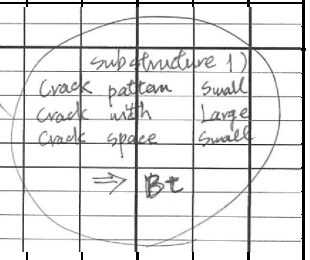


Bridge Evaluation Report Form

Evaluator Date 19/07/17

File Number		Bridge Name	Nagamachi Bridge	Superstructure	Box Culvert	Year	1938
Zone		Circle		Division		Sub-Division	
Evaluation Result				Span No.		Page No.	2/3

Component	Element Type	Material	Type of Defects	At No Repair	Bt Minor Repair	Ct Major Repair	Dt Emergency	Public Safety	Detailed investigation	Remarks
Substructure	Abutment, Pier, Side Wall, Parapet Wall	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
			8.Water leakage /Efflorescence							
			11.Delamination							
		Others	16.Other Types of Defects							
		Common	17.Defects of Reinforcing material							
			19.Discolorlation / Deterioration							
			20.Water Leakage / Puddle							
			21.Abnormal Noise / Vibration							
	* Primary element		23.Deformation / Break							
	Foundation, Footing	Steel	1.Corrosion							
			2.Crack in Steel							
			5.Deterioration of Paint System							
		Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
		Others	16.Other Types of Defects							
		Common	25.Settelment / Tilt / Movement							
	* Primary element		26.Scouring							
	Retaining Wall	Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
			8.Water leakage /Efflorescence							
			11.Delamination							
		Others	16.Other Types of Defects							
		Common	17.Defects of Reinforcing material							
			19.Discolorlation / Deterioration							
			23.Deformation / Break							
			25.Settelment / Tilt / Movement							
	- Secondary element		26.Scour							
Bearings	Bearing Main Body, Anchor Bolts	Steel (Rubber)	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Others	12.Abnormal Spacing							
			15.Function Disorder of Bearings							
			16.Other Types of Defects							
		Common	20.Water Leakage / Puddle							
			21.Abnormal Noise / Vibration							
			23.Deformation / Break							
			24.Accumulation of Debris							
	* Primary element		25.Settelment / Tilt / Movement							
	Bearing Seat Mortal, Bearing Bed concrete	Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
			11.Delamination							
		Others	16.Other Types of Defects							
		Common	20.Water Leakage / Puddle							
	* Primary element		23.Deformation / Break							



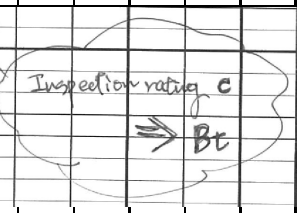
Sample of Box Culvert

Bridge Evaluation Report Form

Evaluator Date 19/07/17

File Number		Bridge Name	Nagamachi Bridge	Superstructure	Box Culvert	Year	1938
Zone		Circle		Division		Sub-Division	
Evaluation Result				Span No.		Page No.	3/3

Element Type	Material	Type of Defects	At No Repair	Bt Minor Repair	Ct Major Repair	Dt Emergency	Public Safety	Detailed investigation	Remarks
Pavement	Others	13.Differnce in Level							
		14.Abnormal Bituminous Pavement							
		16.Other Types of Defects							
- Secondary element	Common	24.Accumulation of Debris							
Bridge Approaches	Others	13.Differnce in Level							
		14.Abnormal Bituminous Pavement							
		16.Other Types of Defects							
- Secondary element	Common	24.Accumulation of Debris							
Expansion Joints (Rubber / Steel) > Including - elements of post-cast concrete	Steel (Rubber)	1.Corrosion							
		2.Crack in Steel							
		3.Loose or Missing Bolts							
		4.Fracture							
		5.Deterioration of Paint System							
	Concrete	6.Crack							
		11.Delamination							
	Others	12.Abnormal Spacing							
		13.Differnce in Level							
		16.Other Types of Defects							
	Common	20.Water Leakage / Puddle							
		21.Abnormal Noise / Vibration							
		23.Deformation / Break							
- Secondary element		24.Accumulation of Debris							
Railing (Steel / Concrete) Wheel Guard (Concrete) > Including - Guard Fence - Median - Curb	Steel	1.Corrosion							
		2.Crack in Steel							
		3.Loose or Missing Bolts							
		4.Fracture							
		5.Deterioration of Paint System							
	Concrete	6.Crack							
		7.Spalling / Exposed Rebar							
		8.Water leakage /Efflorescence							
		11.Delamination							
	Others	16.Other Types of Defects							
	Common	19.Discolorlation / Deterioration							
- Secondary element		23.Deformation / Break							
Drainage System > Including - Catch-Basin - Drainage Pipe	Steel Polyvinyl	1.Corrosion							
		4.Fracture							
		5.Deterioration of Paint System							
	Others	16.Other Types of Defects							
	Common	19.Discolorlation / Deterioration							
		20.Water Leakage / Puddle							
		23.Deformation / Break							
- Secondary element		24.Accumulation of Debris							
Lighting Facility Road Sign Facility	Steel	1.Corrosion							
		2.Crack in Steel							
		3.Loose or Missing Bolts							
		4.Fracture							
		5.Deterioration of Paint System							
	Others	16.Other Types of Defects							
	Common	19.Discolorlation / Deterioration							
- Secondary element		23.Deformation / Break							
Inspection Facility Utilitiy Pipe	Steel	1.Corrosion							
		2.Crack in Steel							
		3.Loose or Missing Bolts							
		4.Fracture							
		5.Deterioration of Paint System							
	Others	16.Other Types of Defects							
	Common	21.Abnormal Noise / Vibration							
- Secondary element		23.Deformation / Break							



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Periodic Inspection/Evaluation Report Form (Sample)

File Number	N1, 8b			Inspector		Date	
Zone	Dhaka	Circle	Dhaka	Division	Narayangnj-1	Sub-Division	Narayangnj-1
District		Upazilla		Union		Village	
Road No.	N1	Road Name	Dhaka(Jatrabari)-Comilla-Chittagong-Taknaf	LRP Name	8b	GPS Lat	23d-42'-7.5"
						GPS Long	90d-30'-57.3"
Bridge Name	Nagamachi Bridge		LRP+Offset (m)	5+3976		Chainage (km)	8.976
Year of Construction	1938	Design Standard		Design Load	TL-20	Load Ristriction	6 (ton)

Feature Intersected		Owner	Public Utilities Carried		Owner
	River	Owner		telephone line	Owner
	Road	Owner		water	Owner
	Railway	Owner			

Bridge Length	4.420	No. of Spans	1	Span Arrangement	4.420	Skew Angle (degree)	63

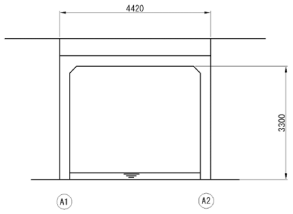
		Type	Material		Type	Material
Superstructure		Box Culvert	Concrete	Deck Slab	RC	Concrete
Substructure	Abutment	---		Foundation (Abutment)	---	Steel
	Pier	---		Foundation (Pier)	---	
Other Elements	Pavement	Asphalt		Bearings	None	
	Expansion Joint	None		Railing	Steel	

Width	Total Width	6.05 m	Wheel Guard-L	Sidewalk-L	Carriage way-L	Median	Carriage way-R	Sidewalk-R	Wheel Guard-R
	Effective Width	6.05 m	0.2 m	0.0 m	5.65 m	0.0 m	0.0 m	0.2 m	0.0 m

Traffic Conditions	Census (year)		Heavy Vehicle Traffic Rate (%)	0～10・10～20・20～30・30～
	Traffic Volume	Vehicles (Daytime 12 hours)	Condition Category for Entire Bridge	35 B

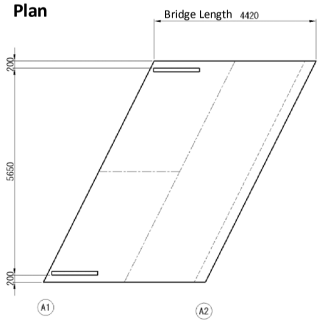
General View

Side View

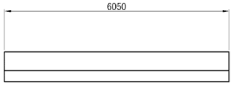


General View of the Span

Plan



Cross Section



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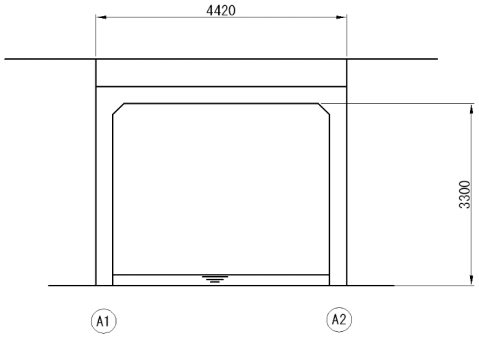
Sample of Box Culvert 2

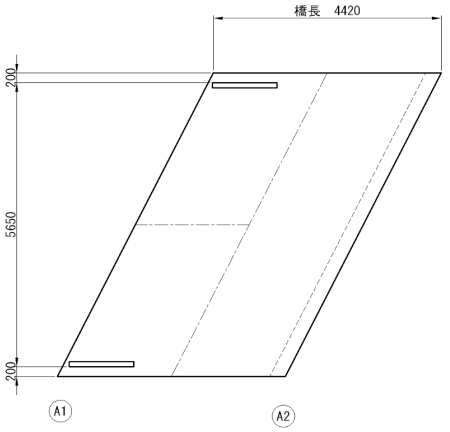
General Drawings

Bridge Number		Bridge Name	Nagamachi Bridge	Route Name	

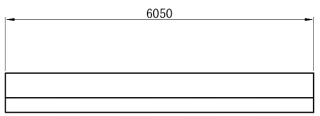
General View



Plan



Cross Section



Overall View Photo

Bridge Number		Bridge Name	Nagamachi Bridge	Route Name	

Viewpoint	Side View
Date	

Viewpoint	Front View
Date	

Viewpoint	Under Bridge
Date	

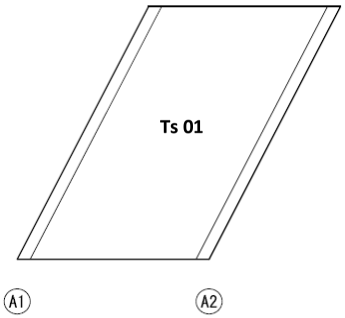
Sample of Box Culvert 2

Element Numbering System

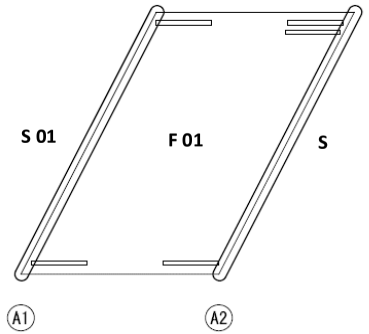
Bridge Number		Bridge Name	Nagamachi Bridge	Route Name	

Span No.	1

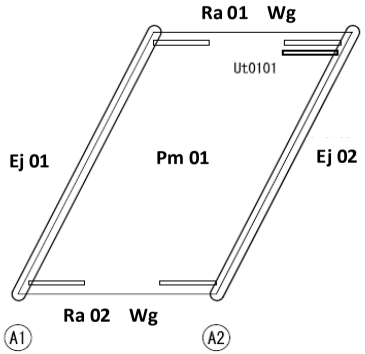
Top Slab (Ts)



Side Wall (S), Footing (F)



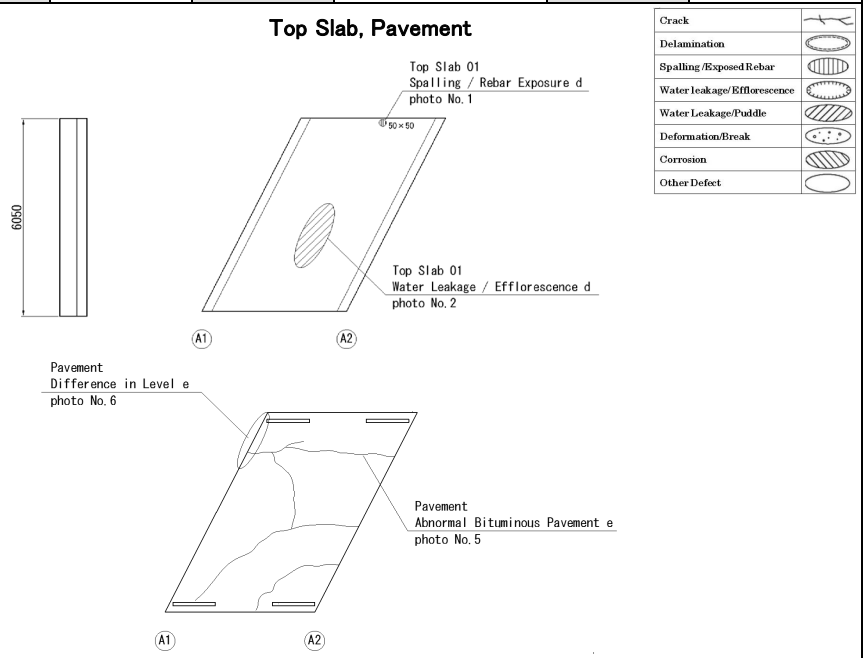
Railing (Ra), Wheel Gurad(Wg)
Expansion Joint (Ej), Pavement (Pm)



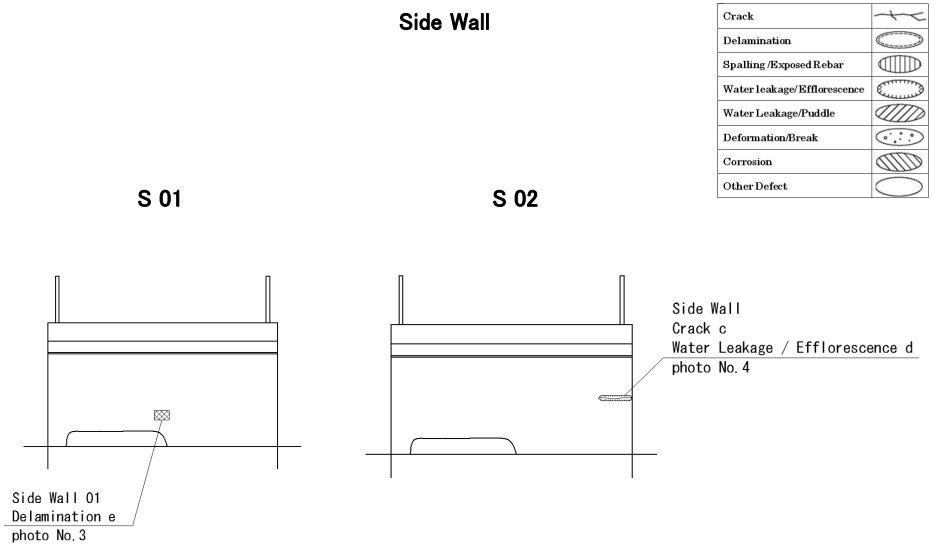
Defect Sketch

Bridge Number		Bridge Name	Nagamachi Bridge	Route Name	

Top Slab, Pavement



Side Wall



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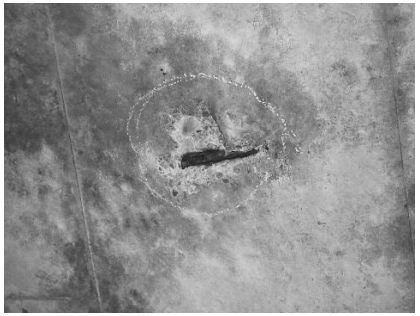
Sample of Box Culvert 2

Defect Photos

Bridge Number		Bridge Name	Nagamachi Brid	Route Name	

Span No.	1	Photo No.	1	Span No.	1	Photo No.	2
Element	Top Slab	Defect	Spalling/Rebar Exposure	Element	Top Slab	Defect	Water Leakage / Puddle
		Rating	d			Rating	e



Span No.	1	Photo No.	3	Span No.	1	Photo No.	4
Element	Side Wall	Defect	Delamination	Element	Side Wall	Defect	Leakage/Efflorescence
		Rating	e			Rating	d

Span No.	1	Photo No.	5	Span No.	1	Photo No.	6
Element	Pavement	Defect	Abnomal Bituminous	Element	Pavement	Defect	Diffrence in Level
		Rating	e			Rating	e

Periodic Inspection Report Form

Inspector Date

File Number		Bridge Name	Ngamachi Bridge	Superstructure	Box Culvert	Year	1938
Zone		Circle		Division		Sub-Division	
Survey Result		No. of Hinge	0	Span Length	4.42m	Span No.	1

Items of Defects		Steel Material					Concrete Material						Others				Common									Remarks
		Corrosion	Crack	Loose or Missing Bolts	Fracture	Deterioration of Paint System	Crack	Spalling/Exposed Rebar	Water Leakage/Eflorescence	Fallen-out of Deck Slab	Crack of Deck Slab	Delamination	Abnormal Spacing	Difference in Level	Abnomal Bituminous Pavement	Functional disorder of Bearings	Others	Defects of Reinforced Materials	Abnormal Anchorage	Discoloration/deterioration	Water Leakage /Puddle	Abnormal Noise/Vibration	Abnormal Deflection	Deformation/Break	Accumulation of Debris	Settlement/Tilt/Movement	Scour	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
Top Slab	01							d	e																			
Side Wall	01						c		d			e															
Footing	01																											
Retaining Wall	01																											
Railing (Steel)	01																											
Wheel Gurad	01																											
Drainage System	01																											
Pavement	01													e	e													
Bridge Approaches	01																											
Lighting Facility	01																											
Road Sign	01																											
Utility Pipe	01																											
Summary																												
Recommendation																												

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Bridge Evaluation Report Form

Evaluator Date

File Number		Bridge Name	Nagamachi Bridge	Superstructure	Box Culvert	Year	1938
Zone		Circle		Division		Sub-Division	
Evaluation Result					Span No.	1	Page No. 1/3

Component	Element Type	Material	Type of Defects	At No Repair	Bt Minor Repair	Ct Major Repair	Dt Emer-gency	Public Safety	Detailed investi-gation	Remarks
Superstructure	Main Girder Main Truss Main Arch Outer Cable Main Tower Arch Rib Top Slab * Primary element	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Concrete	6.Crack	✔						
			7.Spalling / Exposed Rebar		✔					
			8.Water leakage /Efflorescence		✔					
			11.Delamination	✔						
		Others	12.Abnormal Spacing	✔						
			16.Other Types of Defects	✔						
		Common	17.Defects of Reinforcing material							
			18.Abnormal Anchorage							
			19.Discolorlation / Deterioration	✔						
			20.Water Leakage / Puddle	✔						
			21.Abnormal Noise / Vibration	✔						
			22.Abnormal Deflection							
			23.Deformation / Break	✔						
	Cross Beam Stringer * Primary element	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
			8.Water leakage /Efflorescence							
			11.Delamination							
		Others	16.Other Types of Defects							
		Common	17.Defects of Reinforcing material							
			18.Abnormal Anchorage							
			19.Discolorlation / Deterioration							
			21.Abnormal Noise / Vibration							
			22.Abnormal Deflection							
			23.Deformation / Break							
	Lateral Bracing - Secondary element	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Others	16.Other Types of Defects							
		Common	17.Defects of Reinforcing material							
			21.Abnormal Noise / Vibration							
			23.Deformation / Break							
	Deck Slab * Primary element	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Concrete	7.Spalling / Exposed Rebar							
			8.Water leakage /Efflorescence							
			9.Fallen out of Deck Slab							
			10.Crack of Deck Slab							
			11.Delamination							
		Others	16.Other Types of Defects							
		Common	17.Defects of Reinforcing material							
			18.Abnormal Anchorage							
			19.Discolorlation / Deterioration							
			20.Water Leakage / Puddle							
			23.Deformation / Break							

Bridge Evaluation Report Form

Evaluator					Date						
File Number		Bridge Name	Nagamachi Bridge	Superstructure	Box Culvert			Year	1938		
Zone		Circle		Division				Sub-Division			
Evaluation Result					Span No.			1	Page No.		2/3

Component	Element Type	Material	Type of Defects	At No Repair	Bt Minor Repair	Ct Major Repair	Dt Emer-gency	Public Safety	Detailed investi-gation	Remarks
Substructure	Abutment Pier Side Wall Parapet Wall	Steel	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Concrete	6.Crack		✔					
			7.Spalling / Exposed Rebar	✔						
			8.Water leakage /Efflorescence		✔					
			11.Delamination		✔					
		Others	16.Other Types of Defects	✔						
		Common	17.Defects of Reinforcing material	✔						
			19.Discolorlation / Deterioration	✔						
			20.Water Leakage / Puddle	✔						
			21.Abnormal Noise / Vibration	✔						
	* Primary element		23.Deformation / Break	✔						
	Foundation Footing	Steel	1.Corrosion							
			2.Crack in Steel							
			5.Deterioration of Paint System							
		Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
		Others	16.Other Types of Defects							
		Common	25.Settelment / Tilt / Movement							
	* Primary element		26.Scouring							
	Retaining Wall	Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
			8.Water leakage /Efflorescence							
			11.Delamination							
		Others	16.Other Types of Defects							
		Common	17.Defects of Reinforcing material							
			19.Discolorlation / Deterioration							
			23.Deformation / Break							
			25.Settelment / Tilt / Movement							
	- Secondary element		26.Scour							
Bearings	Bearing Main Body Anchor Bolts	Steel (Rubber)	1.Corrosion							
			2.Crack in Steel							
			3.Loose or Missing Bolts							
			4.Fracture							
			5.Deterioration of Paint System							
		Others	12.Abnormal Spacing							
			15.Function Disorder of Bearings							
			16.Other Types of Defects							
		Common	20.Water Leakage / Puddle							
			21.Abnormal Noise / Vibration							
			23.Deformation / Break							
			24.Accumulation of Debris							
	* Primary element		25.Settelment / Tilt / Movement							
	Bearing Seat Mortal Bearing Bed concrete	Concrete	6.Crack							
			7.Spalling / Exposed Rebar							
			11.Delamination							
		Others	16.Other Types of Defects							
		Common	20.Water Leakage / Puddle							
	* Primary element		23.Deformation / Break							

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Sample of Box Culvert 2

Bridge Evaluation Report Form

Evaluator					Date						
File Number		Bridge Name	Nagamachi Bridge	Superstructure	Box Culvert			Year	1938		
Zone		Circle		Division				Sub-Division			
Evaluation Result					Span No.			1	Page No.		3/3

Element Type	Material	Type of Defects	At No Repair	Bt Minor Repair	Ct Major Repair	Dt Emer-gency	Public Safety	Detailed investi-gation	Remarks
Pavement	Others	13.Differnce in Level	✔		✔				
		14.Abnormal Bituminous Pavement		✔					
		16.Other Types of Defects	✔						
- Secondary element	Common	24.Accumulation of Debris	✔						
Bridge Approaches	Others	13.Differnce in Level							
		14.Abnormal Bituminous Pavement							
		16.Other Types of Defects							
- Secondary element	Common	24.Accumulation of Debris							
Expansion Joints (Rubber / Steel) > Including - elements of post-cast concrete	Steel (Rubber)	1.Corrosion							
		2.Crack in Steel							
		3.Loose or Missing Bolts							
		4.Fracture							
		5.Deterioration of Paint System							
	Concrete	6.Crack							
		11.Delamination							
	Others	12.Abnormal Spacing							
		13.Differnce in Level							
		16.Other Types of Defects							
	Common	20.Water Leakage / Puddle							
		21.Abnormal Noise / Vibration							
		23.Deformation / Break							
- Secondary element		24.Accumulation of Debris							
Railing (Steel / Concrete) Wheel Guard (Concrete) > Including - Guard Fence - Median - Curb	Steel	1.Corrosion							
		2.Crack in Steel							
		3.Loose or Missing Bolts							
		4.Fracture							
		5.Deterioration of Paint System							
	Concrete	6.Crack							
		7.Spalling / Exposed Rebar							
		8.Water leakage /Efflorescence							
		11.Delamination							
	Others	16.Other Types of Defects							
	Common	19.Discolorlation / Deterioration							
- Secondary element		23.Deformation / Break							
Drainage System > Including - Catch-Basin - Drainage Pipe	Steel Polyvinyl	1.Corrosion							
		4.Fracture							
		5.Deterioration of Paint System							
	Others	16.Other Types of Defects							
	Common	19.Discolorlation / Deterioration							
		20.Water Leakage / Puddle							
		23.Deformation / Break							
- Secondary element		24.Accumulation of Debris							
Lighting Facility Road Sign Facility	Steel	1.Corrosion							
		2.Crack in Steel							
		3.Loose or Missing Bolts							
		4.Fracture							
		5.Deterioration of Paint System							
	Others	16.Other Types of Defects							
	Common	19.Discolorlation / Deterioration							
- Secondary element		23.Deformation / Break							
Inspection Facility Utilitiy Pipe	Steel	1.Corrosion							
		2.Crack in Steel							
		3.Loose or Missing Bolts							
		4.Fracture							
		5.Deterioration of Paint System							
	Others	16.Other Types of Defects							
	Common	21.Abnormal Noise / Vibration							
- Secondary element		23.Deformation / Break							

A P P E N D I X

EXCERPT

INSPECTION & EVALUATION MANUAL

1. Types of Defects and Rating

The types of defects and ratings defined in this manual are summarized as follows;

Table 1 Summary of Types of Defects and Rating

Material	No.	Faults & Defects	Rating of Defects					Remarks
Steel								
	1)	Corrosion	a	b	c	d	e	Depth & Extent
	2)	Crack in Steel	a	-	c	-	e	
	3)	Loose or Missing Bolts	a	-	c	-	e	
	4)	Fracture	a	-	-	-	e	
	5)	Deterioration of Paint System	a	-	c	d	e	Paint, Metal Spraying, Weathering Steel
Concrete								
	6)	Crack	a	b	c	d	e	Crack Width & Spacing
	7)	Spalling /Exposed Rebar	a	-	c	d	e	
	8)	Water leakage/ Efflorescence	a	-	c	d	e	
	9)	Fallen out of Deck Slab	a	-	-	-	e	
	10)	Cracking of Deck Slab	a	b	c	d	e	Crack Width & Spacing
	11)	Delamination	a	-	-	-	e	
Other Materials								
Other Materials	12)	Abnormal Spacing	a	-	c	-	e	
	13)	Difference in Level	a	-	c	-	e	T≧20mm or not
	14)	Abnormal Bituminous Pavement	a	-	c	-	e	
	15)	Functional Disorder of Bearings	a	-	-	-	e	
	16)	Other Types of Defects	a	-	-	-	e	Illegal Occupation, Scrawl, Missing of Sealing material, Fire Damage etc.
Common Defects								
Common	17)	Defects of Reinforcing Materials for Rehabilitation/Strengthening	a		c		e	Steel Plate, Fiber, Concrete Member, Painting
	18)	Abnormal Anchorage	a	-	c	-	e	Anchorage of PC Tendon
	19)	Discoloration/Deterioration of Materials	a	-	-	-	e	Concrete, Rubber, Plastics
	20)	Water Leakage/Puddle	a	-	-	-	e	
	21)	Abnormal Noise/Vibration	a	-	-	-	e	
	22)	Abnormal Deflection	a	-	-	-	e	
	23)	Deformation/Break	a	-	c	-	e	
	24)	Accumulation of Debris	a	-	-	-	e	
	25)	Settlement/Tilt/Movement	a	-	-	-	e	
	26)	Scouring	a	-	c	-	e	

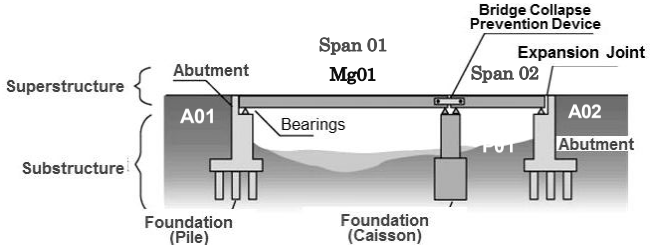
Bridge Element Numbering System

In order to standardize the reporting system and to easily interpret the inspection report, a reference system in identifying the bridge components and elements are devised. The reference systems are described below:

1) Superstructure

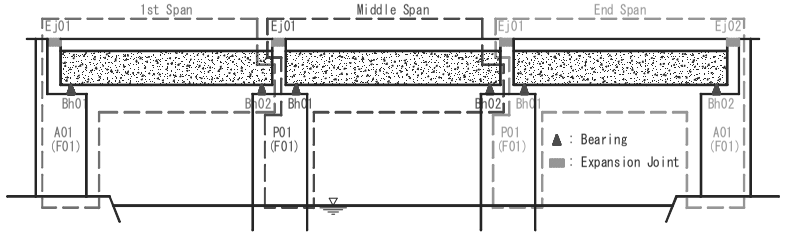
The superstructure element numbering system should include the spans, the girders, and in case of truss the panel point

The spans should be numbered consecutively, with Span 1 located at the beginning of the bridge. Multiple girders should be numbered consecutively from left to right facing in the route directions.

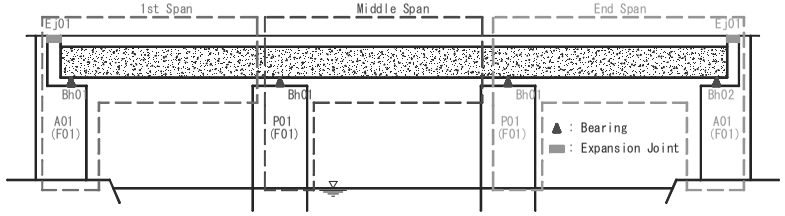


Each element of main girders and deck slab, abutment and piers, and bearings is numbered according to the following span configuration..

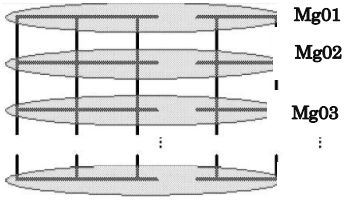
a. Simple span



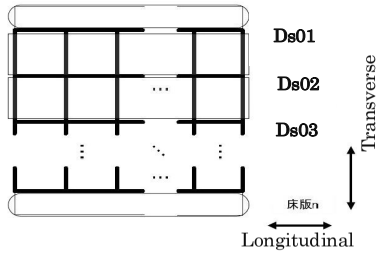
b. Continuous Span



Main Girders



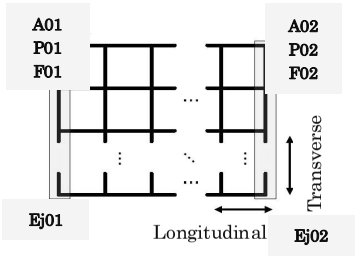
Deck Slab



2) Substructure and Expansion joint

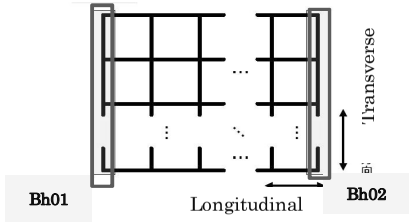
Substructure element numbering system should include the abutments and piers. A01 is located at the beginning of the bridge, and A02 is located at the end.

The piers should be numbered consecutively, with P01 located closest to the beginning of the bridge.



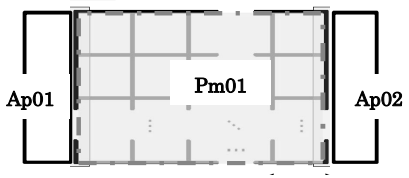
3) Bearings (Bh)

Bearings are numbered consecutively as a lined group on an abutment or a pier regardless of the number and types of bearings.



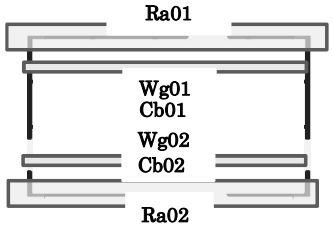
4) Pavement (Pm), Approaches (Ap)

Pavement is defined as one section in a span. Approaches are classified as that of closer to the origin and that of closer to the terminus.



5) Railing (Ra), Wheel Guard(Wg), Curb (Cb)

Railing, wheel guard, curb are numbered along either left or right side line in the same way.



A P P E N D I X

EXCERPT : REHABILITATION MANUAL

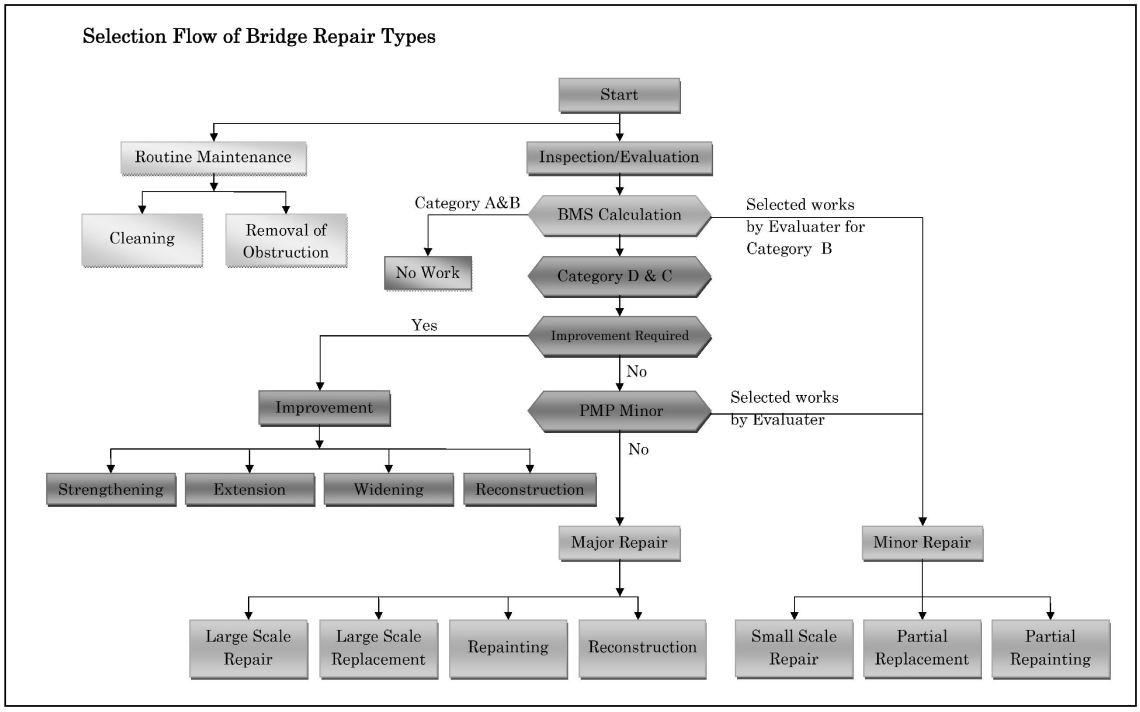


Figure 1-4 Selection Flow of Bridge repair types

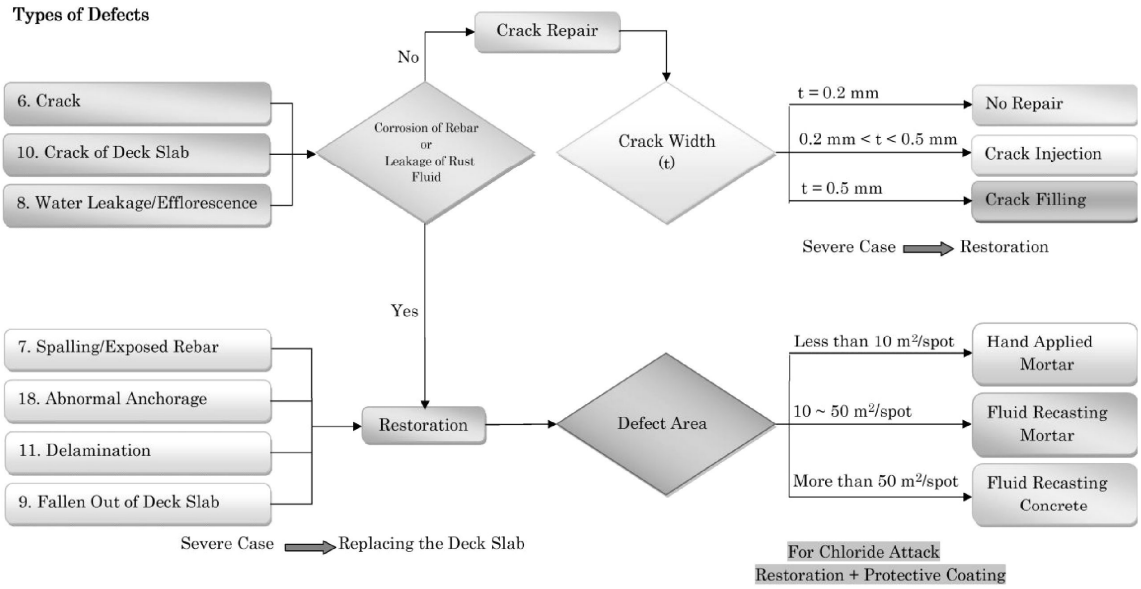


Figure 4-1 Selection Flow of Repair method of Concrete elements (Superstructure)

The Flow based by Local Government Jp

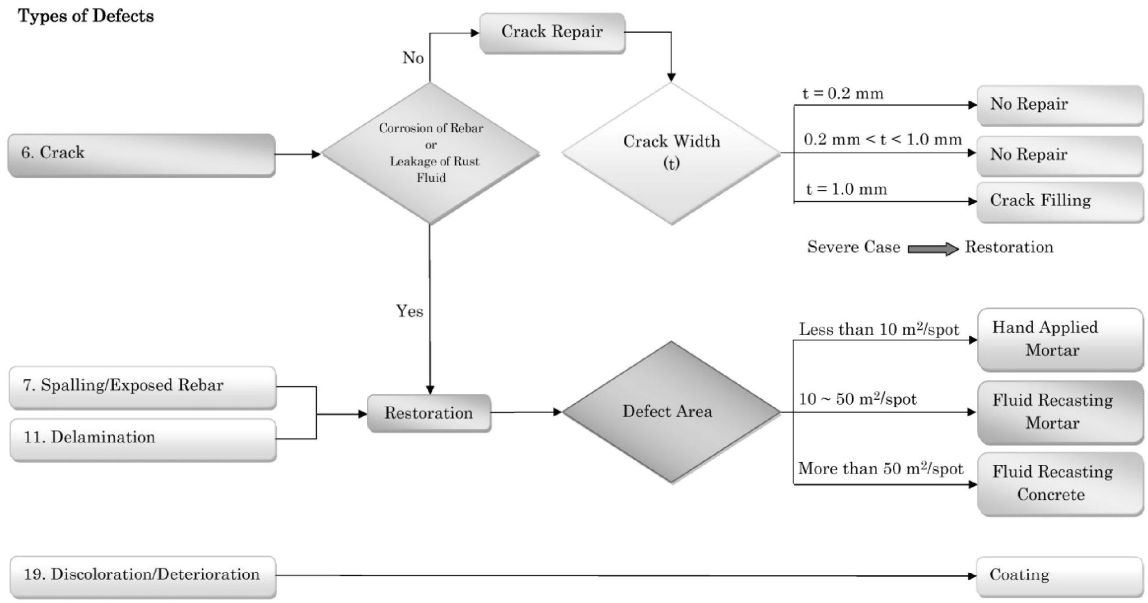


Figure 4-2 Selection Flow of Repair method of Concrete elements (Substructure)

The Flow based by Local Government Jp

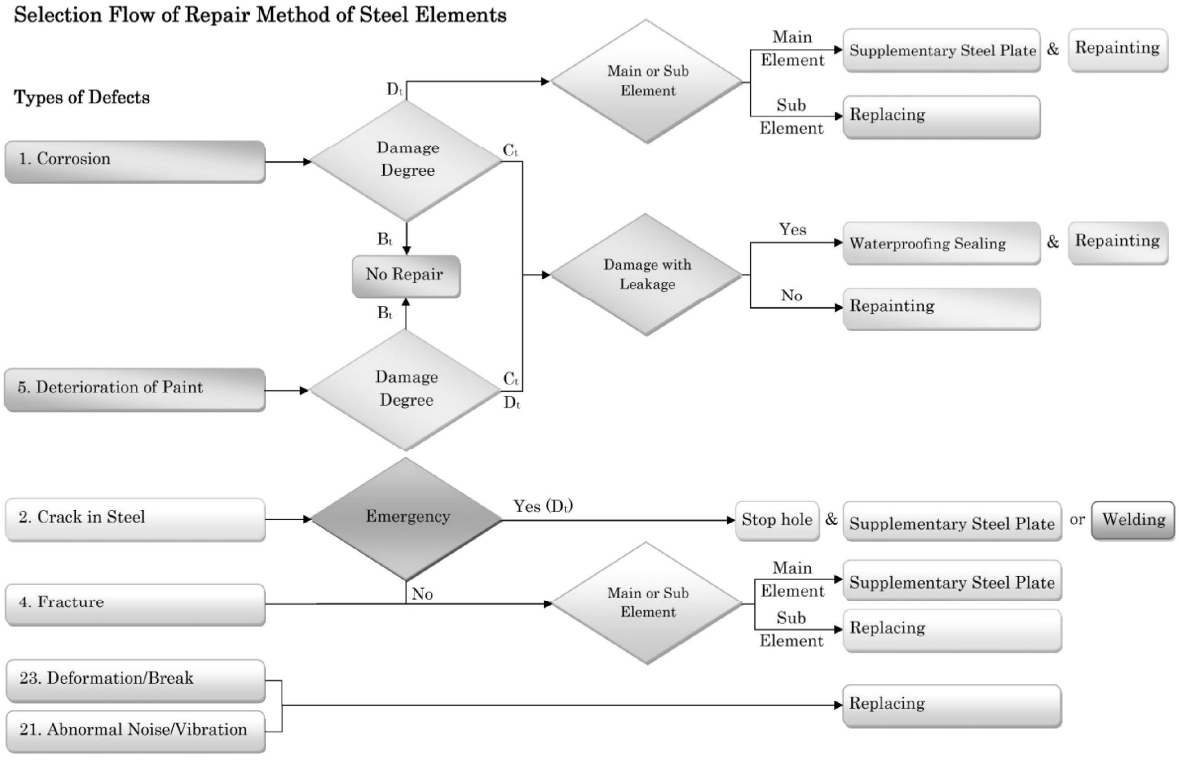


Figure 4-3 Selection Flow of Repair method of steel elements

The Flow based by Local Government Jp

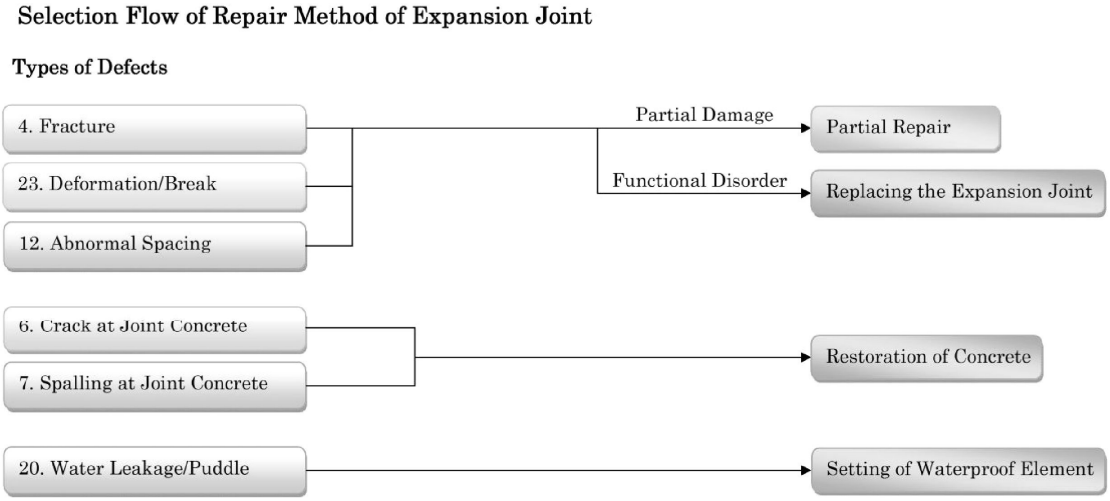


Figure 4-9 Selection Flow of Repair method of Expansion joint

The Flow based by Local Government Jp

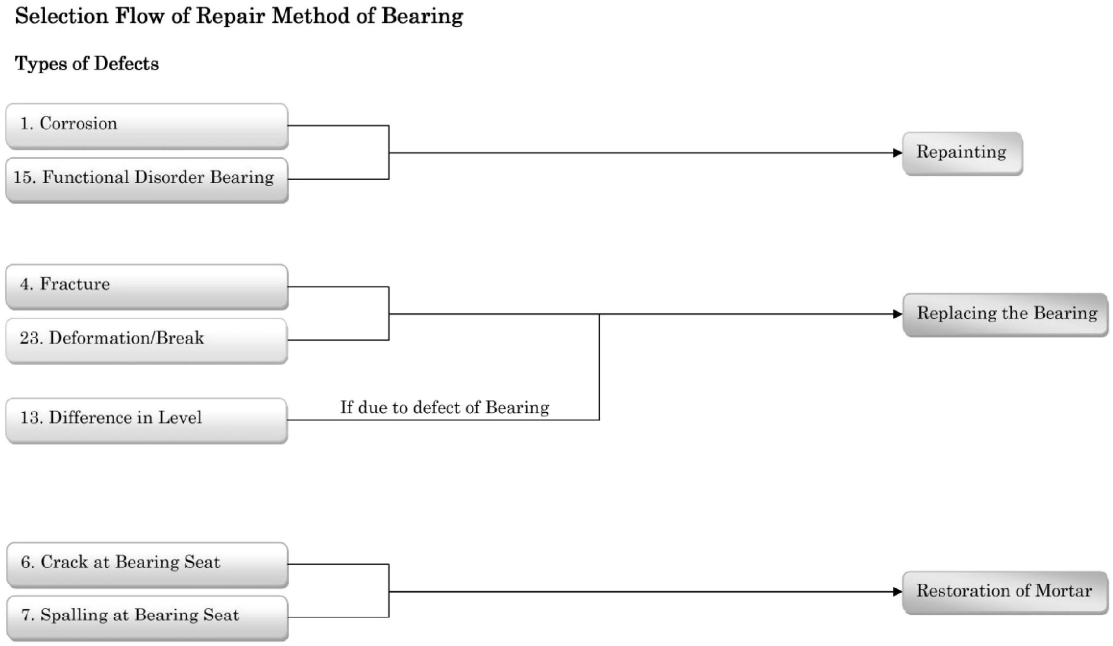


Figure 4-11 Selection Flow of Repair method of Bearing

The Flow based by Local Government Jp

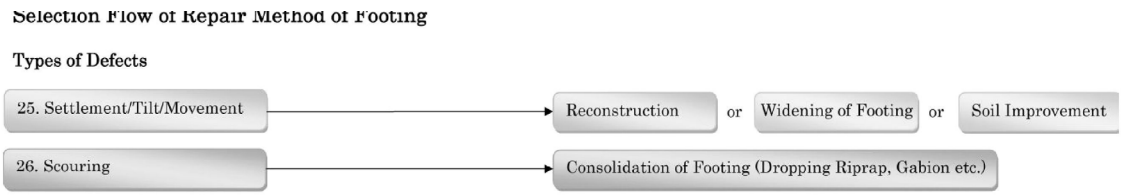


Figure 4-13 Selection Flow of Repair method of Footing

The Flow based by Local Government Jp

A P P E N D I X

SAMPLE OF COST ESTIMATE

Unit Price List of Cost Estimation

No.	Item	Description	Unit	Unit Price (BDT)	Remarks
1.Common					
1.1	Scaffoldings for Bridge Rehabilitation/Strengthening				
Cost-1	Suspended Scaffolding Work	Type A	m2	20,278	Cost-1
Cost-2	Suspended Scaffolding Work	Type B	m2	20,278	Cost-2
Cost-3	Suspended Scaffolding Work	Type C	m2	20,278	Cost-3
Cost-4	Prefabricated Scaffolding Work		m3	812	Cost-4
1.2	Excavation and Backfill for Structures				
Cost-11	Excavation and Backfill Work on Land		m3	473	Cost-11
Cost-12	Excavation and Backfill Work in River	Water Depth of 1 m or Less: Sandy Soil	m3	585	Cost-12
Cost-13	Excavation and Backfill Work in River	Water Depth of Over 1 m: Sandy Soil	m3	601	Cost-13
Cost-14	Excavation and Backfill Work in River	Water Depth of 1 m or Less: Soft Rock	m3	648	Cost-14
Cost-15	Excavation and Backfill Work in River	Water Depth of Over 1 m: Soft Rock	m3	661	Cost-15
2. Concrete Element					
2.1	Surface Protection Coating				
Cost-21	Surface Protection Coating		m2	2,962	Cost-21
2.2	Repairing of Crack				
Cost-22	Repairing of Crack	Crack Filling	m	89	Cost-22
Cost-23	Repairing of Crack	Crack Injection	m	5,419	Cost-23
2.3	Concrete Restruction				
Cost-24	Concrete Restruction	Hand Applied Mortar	m3	197,579	Cost-24
Cost-25	Concrete Restruction	Fluid Recasting Mortar	m3	95,793	Cost-25
Cost-26	Concrete Restruction	Fluid Recasting Concrete	m3	100,036	Cost-26
Cost-27	Concrete Restruction	Spray Applied Mortar	m3	1,938,644	Cost-27
2.4	Replacement of Curb				
Cost-28	Replacement of Curb		m3	43,930	Cost-28
2.5	CFRP Bonding on Concrete Member				
Cost-29	CFRP Bonding on Concrete Member		m2	55,422	Cost-29

Unit Price List of Cost Estimation

No.	Item	Description	Unit	Unit Price (BDT)	Remarks
3. Steel Element					
3.1	Re-painting of Steel Member				
Cost-31	Re-painting of Steel Member		m2	2,323	Cost-31
3.2	Supplementing Steel Plate				
Cost-32	Supplementing Steel Plate		m2	75,045	Cost-32
3.3	CFRP Bonding on Steel Member				
Cost-33	CFRP Bonding on Steel Member		m2	58,768	Cost-33
4. Concrete Deck					
Cost-41	Replacement of Concrete Deck	30m length, 10.2m width and deck slab of 250mm thickness	span	24,958,168	Cost-41
5. Concrete Pier					
Cost-51	Strengthening of Concrete Pier with Spray Applied Mortar	10m height, 1.8m dia meter and lining mortar of 70mm thickness	pier	4,026,677	Cost-51
6. Bearing					
Cost-61	Repairing of Bearing	0.8m x 0.8m	number	1,578	Cost-61
Cost-62	Replacement of Bearing	Rubber Bearing, 200t Type	number	96,979	Cost-62
7. Expansion Joint					
Cost-71	Repairing of Expansion Joint		m	12,612	Cost-71
Cost-72	Replacement of Expansion Joint		m	34,229	Cost-72
8. Road Surface					
Cost-81	Replacement of Asphalt Pavement without Waterproofing	30m length and 7.3m width	span	431,045	Cost-81
Cost-82	Replacement of Asphalt Pavement with Waterproofing of Liquid-Type	30m length and 7.3m width	span	1,287,629	Cost-82
Cost-83	Replacement of Asphalt Pavement with Waterproofing of Sheet-Type	30m length and 7.3m width	span	1,708,637	Cost-83

Unit Price List of Cost Estimation

No.	Item	Description	Unit	Unit Price (BDT)	Remarks
9. Other					
9.1	Replacement of Catch Basin and Drainage				
Cost-91	Replacement of Catch Basin and Drainage		number	5,565	Cost-91
9.2	Replacement of Railing				
Cost-92	Replacement of Railing		m	26,007	Cost-92
9.3	Additional Support for Superstructure				
Cost-93	Additional Support for Superstructure	Cast-in-place Pile	pier	9,814,855	Cost-93
Cost-94	Additional Support for Superstructure	Concrete Pier	pier	7,891,729	Cost-94
Cost-95	Additional Support for Superstructure	Bearing Installation	pier	152,909	Cost-95
9.4	Repairing of Scouring				
Cost-96	Repairing of Scouring		m3	7,009	Cost-96
9.5	Repairing of Slope Protection				
Cost-97	Repairing of Slope Protection	with Grass Sodding	m2	49	Cost-97
Cost-98	Repairing of Slope Protection	with Concrete	m2	1,979	Cost-98
9.6	Repairing of Foundation Consolidation				
Cost-99	Repairing of Foundation Consolidation		m3	13,465	Cost-99
9.7	Repairing of Block Stacking Structure				
Cost-100	Repairing of Block Stacking Structure		m3	20,312	Cost-100

A P P E N D I X

ONLY FOR 1st PERIODIC INSPECTION

BMS BASIC DATA TEMPORARY INPUT MANUAL

1st Periodic Inspection in Bangladesh- BMS Basic Data Temporary Input Manual

Chapter 1. Guideline

This manual is prepared for 1st periodic inspection in Bangladesh.
Because this periodic inspection is first time in Bangladesh and BMMS (old system) doesn't have enough information to prepare inspection*1, we have to input some of information as temporary to start the inspection.

*1 In order to carry out inspection, inspector has to bring Bridge Inventory, Blank inspection sheet*2 and CHECK LIST of INSPECTION. However, "Basic Data" is necessary to create Inventory and Blank inspection sheet.

After each inspection in 1st periodic inspection, all temporary and missing data have to be modified and filled with result of the inspection.

File Number	R504-009a-20171129					Date	Nov 29, 2017		
Zone	Dhaka	Circle	Dhaka	Division	Manikganj	Sub-Division	Manikganj	SO	-
District	Manikganj	Upazila	-	Union	-		Village		-
Road No.	R504	Road Name	Hemayetpur-Singair-Manikganj		LRP Name	009a	GPS	Lat	23º 48' 20"
								Long	90º 11' 22"
Bridge Name	**Aynal bridge**		LRP+Offset	182 (m)			Chainage		9.182 (m)
Year of Construction	2008	Design Standard	AASHTO			Design Load	20 Ton	Load Restriction	-
Public Utilities Carried	-		-						
Bridge Length	25.40 (m)	No. of Spans	1	Span Arrangement	25.4		Skew Angle		-
		Type	Material			Type		Material	
Superstructure	Bridge Type	RC Girder Bridge	Concrete		Deck Slab	-		-	
Substructure	Abutment	RC	-		Foundation (Abutment)	Piled foundations		-	
	Pier	-	-		Foundation (Pier)	Piled foundations		-	
Other Elements	Pavement	Asphalt	-		Bearings	-		-	
	Expansion Joint	-	-		Railing	-		-	
Width	Total Width	9.52 (m)	Curb-L	Sidewalk-L	Carriage way-L	Median	Carriage way-R	Sidewalk-R	Curb-R
	Effective Width	7.30 (m)	-	1.11 (m)	-	-	-	1.11 (m)	-
Traffic Conditions		Census (Year)	-			Condition Category for Entire Bridge		-	A
		Traffic Volume	1,000 to 5,000 Vehicles						

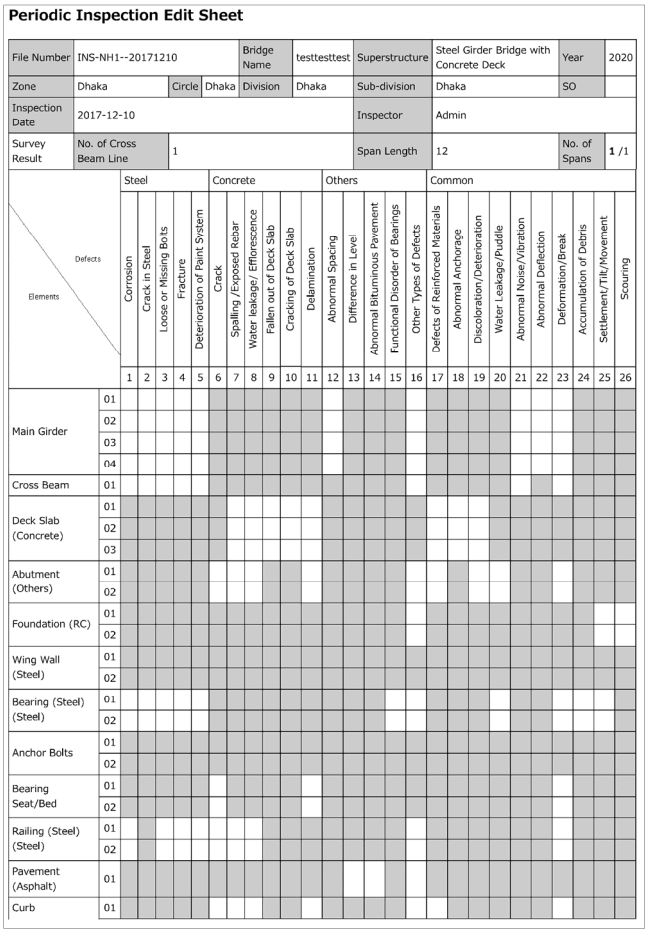
General View

Aynal Bridge

Aynal Bridge

Aynal Bridge

fig. Bridge Inventory

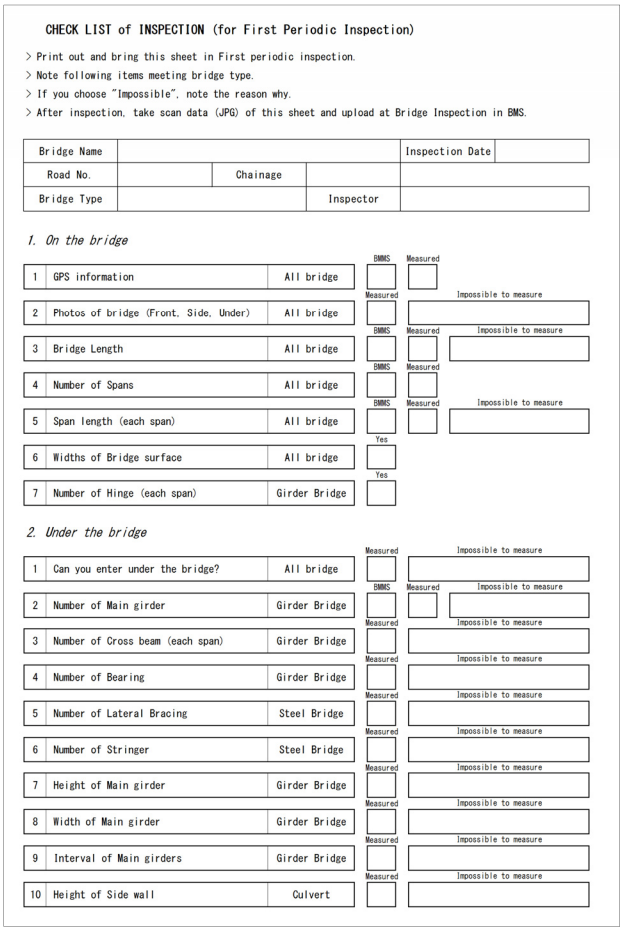


Periodic Inspection Edit Sheet

File Number	INS-NH1--20171210			Bridge Name	testtesttest	Superstructure	Steel Girder Bridge with Concrete Deck	Year	2020
Zone	Dhaka	Circle	Dhaka	Division	Dhaka	Sub-division	Dhaka	SO	
Inspection Date	2017-12-10					Inspector	Admin		
Survey Result	No. of Cross Beam Line	1				Span Length	12	No. of Spans	1 /1

Elements \ Defects		Steel					Concrete						Others					Common								
		Corrosion	Crack in Steel	Loose or Missing Bolts	Fracture	Deterioration of Paint System	Crack	Spalling /Exposed Rebar	Water leakage/ Efflorescence	Fallen out of Deck Slab	Cracking of Deck Slab	Delamination	Abnormal Spacing	Difference in Level	Abnormal Bituminous Pavement	Functional Disorder of Bearings	Other Types of Defects	Defects of Reinforced Materials	Abnormal Anchorage	Discoloration/Deterioration	Water Leakage/Puddle	Abnormal Noise/Vibration	Abnormal Deflection	Deformation/Break	Accumulation of Debris	Settlement/Tilt/Movement	Scouring
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Main Girder	01																										
	02																										
	03																										
	04																										
Cross Beam	01																										
Deck Slab (Concrete)	01																										
	02																										
	03																										
Abutment (Others)	01																										
	02																										
Foundation (RC)	01																										
	02																										
Wing Wall (Steel)	01																										
	02																										
Bearing (Steel) (Steel)	01																										
	02																										
Anchor Bolts	01																										
	02																										
Bearing Seat/Bed	01																										
	02																										
Railing (Steel) (Steel)	01																										
	02																										
Pavement (Asphalt)	01																										
Curb	01																										

fig. Blank Inspection Sheet



CHECK LIST of INSPECTION (for First Periodic Inspection)

> Print out and bring this sheet in First periodic inspection.
> Note following items meeting bridge type.
> If you choose "Impossible", note the reason why.
> After inspection, take scan data (JPG) of this sheet and upload at Bridge Inspection in BMS.

Bridge Name		Inspection Date	
Road No.		Chainage	
Bridge Type		Inspector	

1. On the bridge

			BMMS	Measured	Impossible to measure
1	GPS information	All bridge		Measured	
2	Photos of bridge (Front, Side, Under)	All bridge		Measured	Impossible to measure
3	Bridge Length	All bridge	BMMS	Measured	Impossible to measure
4	Number of Spans	All bridge	BMMS	Measured	
5	Span length (each span)	All bridge	BMMS	Measured	Impossible to measure
6	Widths of Bridge surface	All bridge	Yes		
7	Number of Hinge (each span)	Girder Bridge	Yes		

2. Under the bridge

1	Can you enter under the bridge?	All bridge		Measured	Impossible to measure
2	Number of Main girder	Girder Bridge	BMMS	Measured	Impossible to measure
3	Number of Cross beam (each span)	Girder Bridge		Measured	Impossible to measure
4	Number of Bearing	Girder Bridge		Measured	Impossible to measure
5	Number of Lateral Bracing	Steel Bridge		Measured	Impossible to measure
6	Number of Stringer	Steel Bridge		Measured	Impossible to measure
7	Height of Main girder	Girder Bridge		Measured	Impossible to measure
8	Width of Main girder	Girder Bridge		Measured	Impossible to measure
9	Interval of Main girders	Girder Bridge		Measured	Impossible to measure
10	Height of Side wall	Culvert		Measured	Impossible to measure

fig. CHECK LIST of INSPECTION

table. Documents to carry out Bridge site inspection

Item	description
Bridge Inventory	Basic data like as bridge name, location, shape, general photos and so on are shown in this document.
Blank Inspection Sheet	Blank Inspection sheet is created based on inputted Basic Data automatically. White cells mean necessary to inspect.
CHECK LIST of INSPECTION	This list is record of inspecting condition of each bridge. This list shows reason why impossible to inspect or get information.

You can download those documents from BMS.

Chapter 2. Flowchart of 1st Periodic Inspection

Following flowchart shows steps of bridge site inspection.

Bridge inspection always requires adequate preparation and planning.

1. Information Gathering (in your office)

> You can refer BMMS (and drawings and documents).

> It is difficult to get length information with BMMS.

> It's better to carry out *Pre-survey* to get information and general photos.

↓

2. Inputting Basic Data (before Bridge Site Inspection, in your office)

> Creating new bridge data in BMS and inputting Bridge basic data.

> If you don't have some information to input basic data, you can refer this manual.
You can input them as temporary data or ignore to input into BMS.

↓

3. Preparation Documents for Bridge Site Inspection (in your office)

> Print out Bridge Inventory, Blank Inspection Sheet and CHECK LIST of INSPECTION..

↓

4. Bridge Site Inspection

> Take general photos.

> Get information of bridge shape and number of each element.

> Measure bridge length and width.

> Carry out bridge inspection and note field sketch and rating of defects.

↓

5. After Bridge Site Inspection (in your office)

> Modify or fill basic data inputted as temporary in BMS.

> Input the length information into BMS, if you can measure or estimate them.

→ If you can't get length information, input "Temporary length" referring this manual.

> Upload general photos to BMS.

> Take scan data of field sketch and CHECK LIST and upload them to BMS.

> Edit photo book excel sheet and upload it to BMS as PDF.

fig. Flowchart of Bridge Site Inspection

Chapter 3. Two types of Temporary input

In this manual, two types of temporary input method exist like as following.
It is necessary to pay attention to judge which type of temporary input you use.

- Temporary input to create Blank inspection sheet (rifer Chapter 4)

  Because before 1st Periodic Inspection, it is necessary to create blank inspection sheet, you may input temporary data to fill Basic Data form.
  This type of temporary input allows to set only before bridge site inspection.
  After bridge inspection, "all" temporary inputted data should be modified or filled with true data based on result of the bridge inspection.

  e.g. Basic Name / Shape / Road / Location / Element except "length of main girder / culvert"

- Temporary input because of impossibility to get the information (rifer Chapter 5)

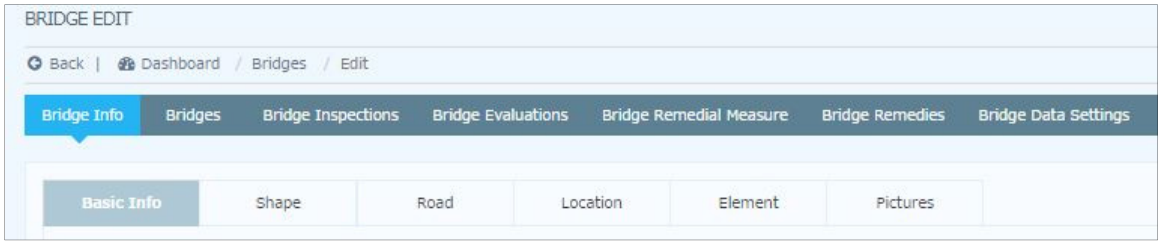
  BMS requires some length information like as "height of main girder, width of main girder, interval of main girders" to calculate rough cost estimate.
  Because of difficulty to approach to the main girder, it may be impossible to get the length information. However without the length data, BMS can't calculate it.
  If you judge impossible to get the length information, you can use temporary data base on formula shown in this manual.

  e.g. Height of Main Girder / Width of Main Girder / Interval of Main Girders
  Width of Culvert / Height of Side Wall

Chapter 4. Temporary input to create Blank inspection sheet

In order to make blank inspection sheet for 1st inspection of each bridge, if you don't have required information, input Basic Data as following rule.

You should try to get actual value for all Basic Data inputted as temporary in site inspection.



< **Basic Info** : for Bridge / Box Culvert>

*1. Bridge NO.**

Bridge NO. is made with GPS(Coordinate) based on following basically.

- GPS Latitude : *12* degree *34* minute *56* second
  GPS Longitude : *98* degree *76* minute *54* second
  →Bridge NO. : 123456987654 (12 letters)
- If the bridge is "parallel bridge (two bridges are built side by side)", because GPS of the bridges are same, 13th letter is required in order to distinguish the bridges. Most popular case of parallel bridge is "upper scream side" and "down scream side". If the bridge locates upper scream side, add "1" as 13th letter. If down scream side, "2".

[Temporary Input]

If the bridge doesn't have GPS information yet, you input temporary figure like as following,

- YYYYMMDDhhmm
  : Y is year, M is month, D is date, h is hour and m is minute when you input the cell like as "201707220958". (2017/22/July AM 9:58)
- You have to get GPS of the bridge at the site. After getting it, temporary number should be modified.

*2. Bridge Name**

Bridge Name should be inputted following rule.

- First letter of each word is *Capital letter*. You can't use Capital letter except them.
- If it's necessary to input number after bridge name, you can't insert space between bridge name and "-". Ex. Test River Bridge-1

[Temporary Input]

If you don't know the Name, input temporary name as "Bridge No.".

*3. Bridge Type**

Choose a type of the bridge.

[Temporary Input]

If you don't have accurate information, choose temporary type from following types.

- If the bridge name includes "bridge" or bridge length is over 10m, then RC Girder Bridge.
- If the bridge name includes "culvert" or bridge length is under 10m, then Box Culvert

Note

If you refer data of BMMS (old system),

- "RCC Girder Bridge" should be inputted as "RC Girder Bridge".
- "Steel Beam & RCC Slab" should be inputted as "Steel Girder Bridge".
- "Bailey Bridge" should be inputted as "Portable Steel Bridge".
- "Slab Culvert" should be inputted as " Box Culvert".

4. Completion Year

Input year to complete building the bridge.

[Temporary Input]

If you don't know it, input temporary year as "2050".

5. Reconstruction Year

If the bridge was rebuilt, input year to complete rebuilding the bridge.
If the bridge has not rebuilt, this cell should be blank.
If you don't have the information, this cell should be blank.

6. Design Standard

If you have information of Design Standard to design the bridge, choose it.

7. Design Load

Design Load is maximum load of vehicles in design the bridge.
If you don't have the information, this cell should be blank.

8. Load Restriction (ton)

Load Restriction is set to control heavy vehicles because of damage of the bridge.
If you don't have the information or no restriction, this cell should be blank.

9. Crossing & Public Utility

After choosing crossing condition under the bridge from pull-down menu, new cell to input information of the crossing condition is created automatically. Input the information.
If the bridge has public utility like as gas, water or electricity, input it by same operation. You can input multiple items. If you don't have the information, this cell should be blank.

*10. Crossing under Bridge**

Choose nearest condition of under the bridge from pull-down menu.

[Temporary Input]

If you don't have the information, you can input temporary figure as "Unknown".

11. Bridge Owner

Input owner name like as RHD office name.
If you don't have the information, this cell should be blank.

12. Description

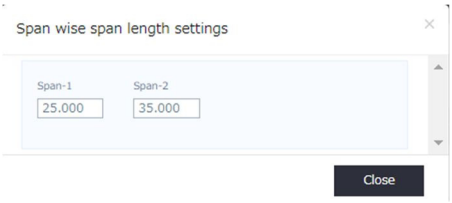
Input explanation of the bridge, if it is necessary.

Public View

Public user can look information in this tab, if you click on this check box.
Click on the check box*.

< **Shape**: for Bridge : except Box Culvert and Slab Culvert >

1. Bridge Length, 4. No. of Span*,*
5. Input Span Length and 6. Span Arrangement

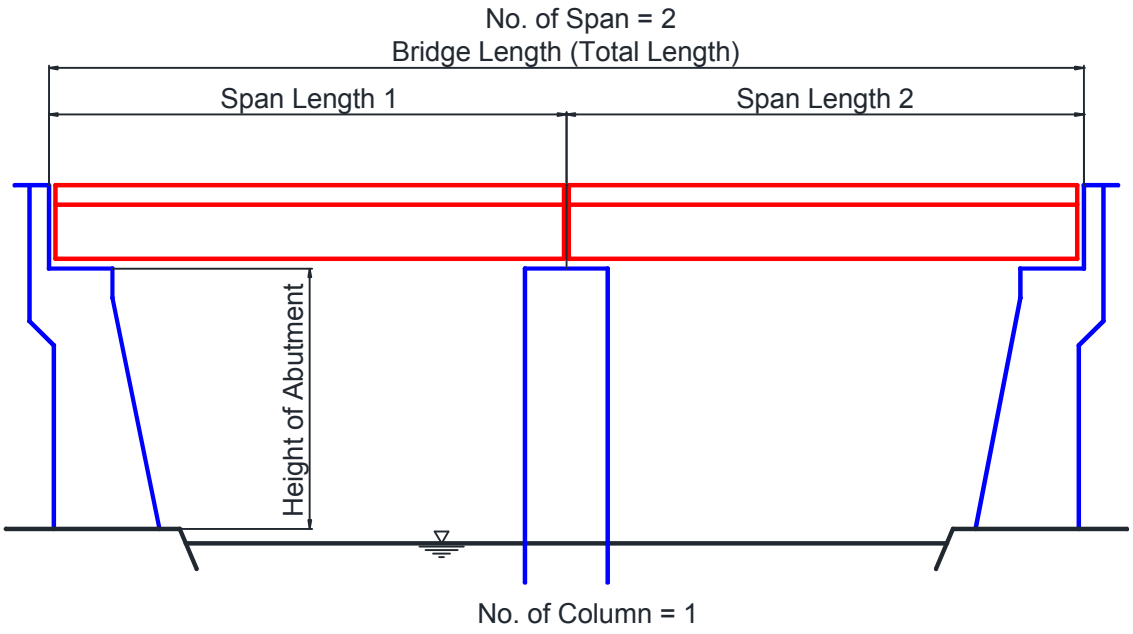


Input length of the bridge. If No. of Span is 1, Span length is same as Bridge Length. After inputting "4. No. of Span", you can input span lengths in "5. Input Span Length" as same number as No. of Span.

[Temporary Input]

If you don't have the information,

- 1. Bridge Length : Input temporary figure as "999.000".
- 4. No. of Span : Input temporary figure as "5".
- 6. Span Arrangement : Input temporary figure as "999.000".



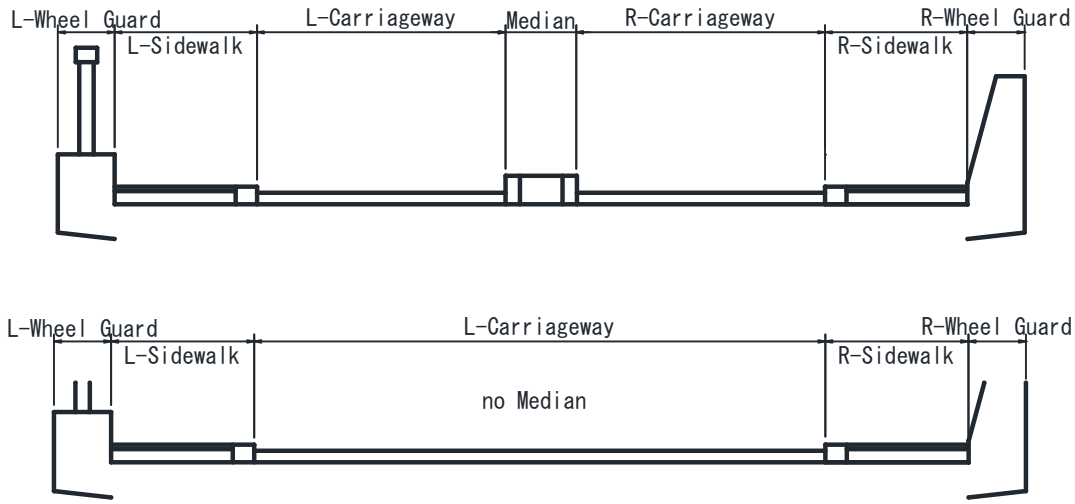
7. No. of Column, 8. Column Width and 9. Height of Abutment

Input shape of substructure.

If you don't have the information, those cells should be blank.

2. Bridge Width, 3. Bridge Effective Width*,*
11. Median, 12(13). L(R)-Wheel guard, 14(15). L(R)-Carriage way,
16. Lanes On Structure, 17. No. of Sidewalk and 18(19). L(R)-Sidewalk

Input width of the bridge referring follow a figure.
If the bridge doesn't have Median, it's not necessary to input R-Carriage way.



[Temporary Input]
If you don't have the information,

- 2. Bridge Width : Input temporary figure as "999.000".
- 3. Bridge Effective Width : Input temporary figure as "999.000".
- Other items : Keep blank as temporary.

21. Interval of Main Girders (except Culvert Bridge),
22. Height of Main Girder (except Culvert Bridge) and
23. Width of Main Girder (except Culvert Bridge)

Input shape of Main Girder.
Each item shows different length by bridge type. Refer following figures.

*[Temporary Input **before 1st Site Inspection**]*
If you don't have the information, this cell should be blank.

*[Temporary Input **after 1st Site Inspection**]*
It may be impossible to measure some length, because of inspector can't approach it.
In that case, the length should be guessed based on photos.
If you can't get the length yet, input temporary figure in Chapter 5.

10. Skew Angle Degree

Input angle of "parapet wall" and "direction of traffic".

Skew angle of bridges are mainly 90° (straight bridge).

If you don't have the information, this cell should be blank.

24. No. of Lines of Cross Beam (except Box Culvert)

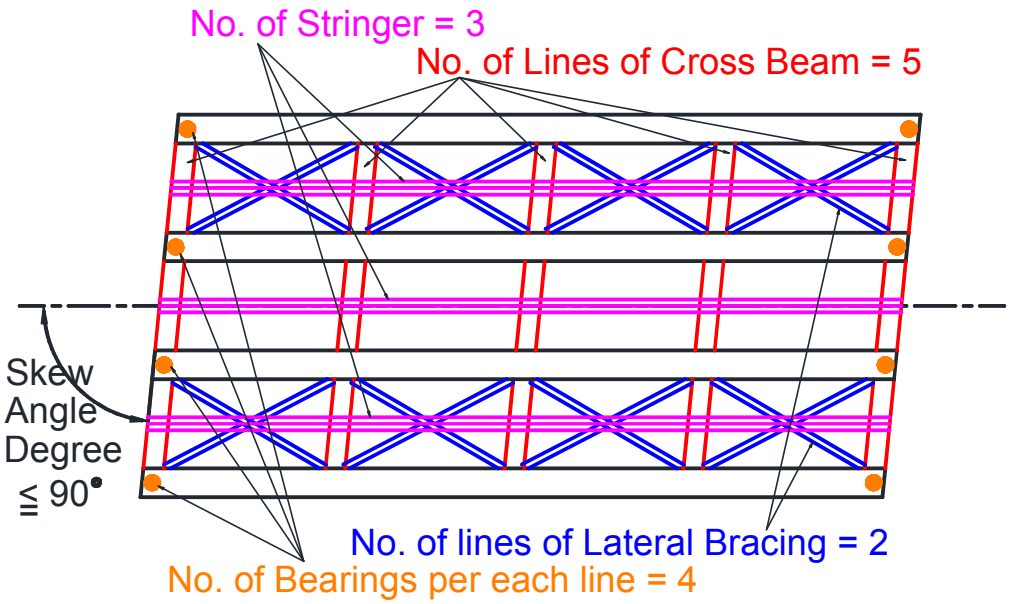
25. No. of Lines of Stringer (Steel Girder Bridge)

27. No. of Bearings per each line (except Box Culvert)

28. No. of Lines of Lateral Bracing (Steel Girder Bridge)

Input number of each lines if the element exists.

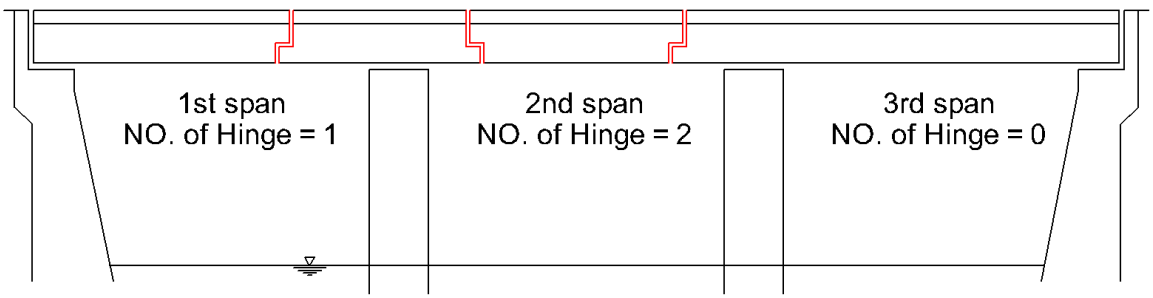
If you don't have the information, this cell should be blank.



26. NO. of Hinge

Input number of the Gerber hinge for each span.

If you don't have the information, this cell should be blank.



< **Shape**: for Box Culvert >

1. Bridge Length, 5. Input Span Length and 6. Span Arrangement*

Refer < **Shape**: for Bridge >.

*4. No. of Span**

[Temporary Input]

If you don't know the info, you can input temporary figure like as

- Bridge Length < 3.5 m : input temporary figure as "1".
- Bridge Length > 3.5 m : input temporary figure as "Round up (Bridge Length / 3.5) +1".
- You don't know the bridge length : input temporary figure as "5".

2. Bridge Width, 3. Bridge Effective Width*, 11. Median, 12(13). L(R)-Wheel guard, 14(15). L(R)-Carriage way, 16. Lanes On Structure, 17. No. of Sidewalk and 18(19). L(R)-Sidewalk*

Refer < **Shape**: for Bridge >.

21. Width of Culvert (m) and 22. Height of Side Wall (m)

Input shape of Box Culvert.

Each item shows different length by bridge type. Refer Chapter 5.

*[Temporary Input **before 1st Site Inspection**]*

If you don't have the information, this cell should be blank.

*[Temporary Input **after 1st Site Inspection**]*

It may be impossible to measure some length, because of inspector can't approach it.

In that case, the length should be guessed based on photos.

If you can't get the length yet, input temporary figure in Chapter 5.

< **Road** : for Bridge / Box Culvert>

1. Road Class, 2. Road No.* and 3. Road Name*

Input information of the road.

You always have these info.

4. LRP Name

Input LRP Name if you can get it from current BMMS.

If you don't have the information, this cell should be blank.

5. New LRP Name

Input New LRP Name of the bridge after putting a new rule of LRP Name.

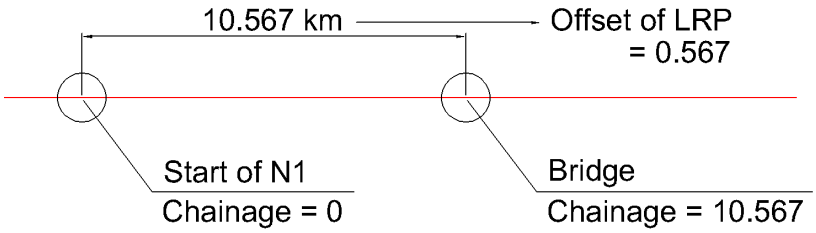
If you don't have the information, this cell should be blank.

6. Offset of LRP and 7. Chainage

Chainage is distance between start of the road and bridge location.

Offset of LRP is figure shown as down to the decimal point of Chainage.

If you don't have the information, this cell should be blank.



8. Number of Lanes

Input number of traffic lanes on the bridge. (same as "16. Lanes On Structure" in Shape)

If you don't have the information, this cell should be blank.

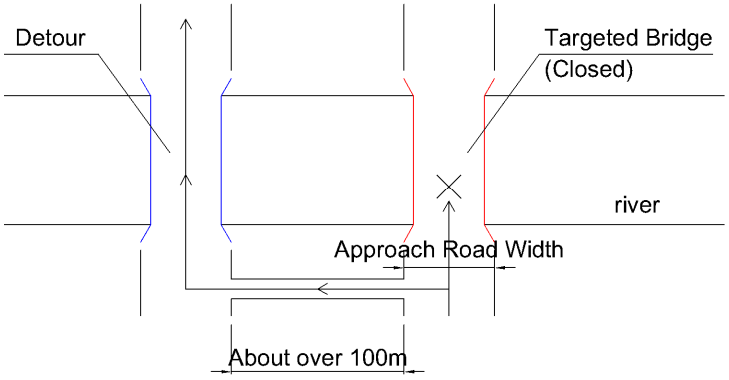
9. Approach Road Width

Input width of approach road of the bridge.

If you don't have the information, this cell should be blank.

*10. Detour/Alternate Route**

If there is another road near the bridge to be able to use as substitute the bridge, choose "exist".



Ex.
When targeted bridge is closed, user can use another bridge as Detour.
In this case, importance degree will be set as lower.

[Temporary Input]

If you don't have this information, choose "none" as temporary.

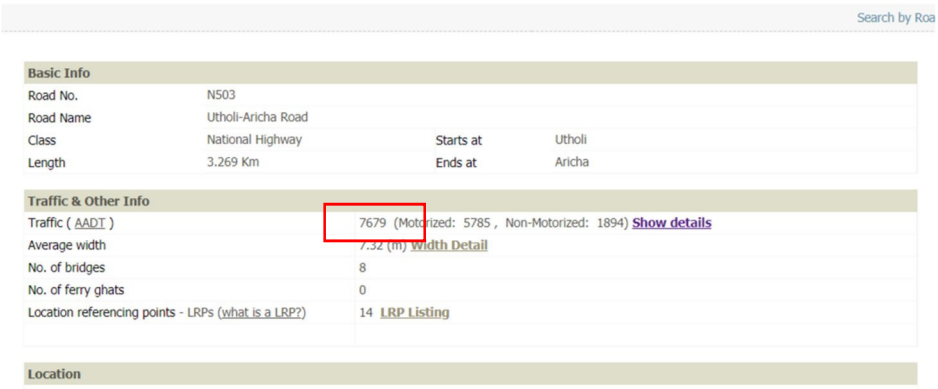
11. Traffic Volume, 12. Heavy Vehicle Traffic Rate and 13. Census*

Choose range of Traffic Volume of the bridge.
This volume shows AADT (Annual Average Daily Traffic).

Note

You can refer RMMS (Road Maintenance & Management System) of RHD.

1. Access to http://www.rhd.gov.bd/RoadDatabase/ and search targeted Road No.
2. Click "Show details" at Traffic (AADT).



4. Choose link No. nearest to targeted bridge and check most right column, "Traffic(AADT)"

- Heavy Vehicle Traffic Rate is calculated as
  " {AADT – (total number of truck and bus)} / AADT " (Micro bus is not including)
- Census is year of last inspection of traffic volume
  Census is survey year of each traffic data. If you don't know, keep blank.

< **Location**: for Bridge / Box Culvert>

1. Zone, 2. Circle*, 3. Division* and 4. Sub Division**

Choose division information of the bridge.
You always have these info.

*5. SAE**

SAE is Section Officer. Choose one from pull-down menu.

[Temporary Input]
If you don't have this information, you can choose SO-1 temporally

6. District, 7. Upazilla, 8. Union, 9. Village and 10. Country

Input location of the bridge.
First letter of each word is Capital letter. You can't use Capital letter except them.
If you don't have the information, this cell should be blank.

11. GPS Latitude, 12. GPS Longitude

Input GPS information of the bridge.
They should be inputted as "xx Degree xx Minute xx Second°".

Note
GPS information is required to display map and make Bridge No.

Input Reference Level of the bridge. If you don't know, keep blank.

< **Element** >

If you don't know the information of each Element, refer following table.

- "Girder Bridge" in following table includes "RC / PC / Steel Girder bridge, Box girder bridge, RC slab bridge, Rigid frame bridge and Small slab bridge".
- "Truss Bailey" in following table includes "Truss PSB".
- "Culvert" in following table includes "Box Culvert".

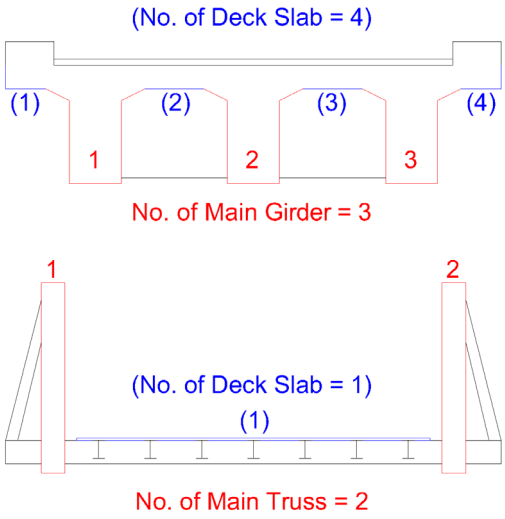
Super-structure

*PSB means Portable Steel Bridge

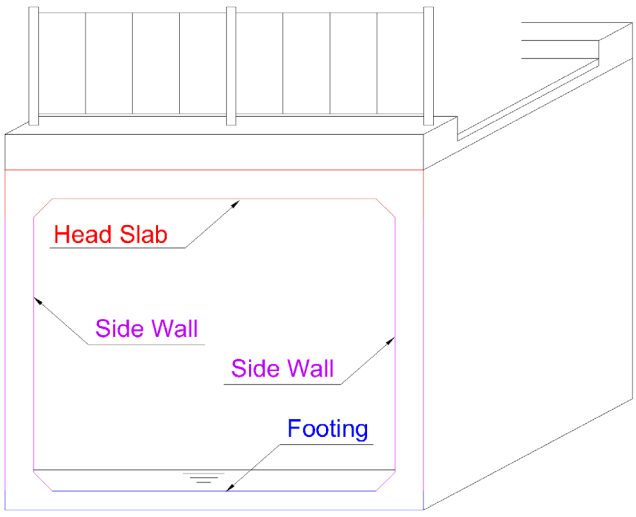
Element		Temporary Parameter	Temporary Number of the Element				Remarks
			Girder Bridge	Truss PSB*	Masonry Arch	Culvert	
1	Main Girder	-	6	-	-	-	
2	Main girder Hinge	-	-	-	-	-	no need for temporary
3	Cross Beam	-	only click on Checkbox	only click on Checkbox	-	-	number has set in "Shape" no need to input figure
4	Stringer	-	-	6	-	-	
5	Deck Slab (Concrete)	Concrete	*Remarks*	-	-	-	*= No. of Main Girder + 1*
6	Main Truss	-	-	2	-	-	
7	Arch Rib	-	-	-	1	-	
8	Outer Cable	-	-	-	-	-	no need for temporary
9	Main Tower	-	-	-	-	-	no need for temporary
10	Head Slab	-	-	-	–	1	
11	Lateral Bracing	-	-	-	-	-	no need for temporary
12	Deck Slab (PC)	-	don't use	-	-	-	use "Deck Slab (Concrete)"
13	Deck Slab (Steel)	Steel	*Remark*	-	-	-	*= No. of Main Girder + 1*

Basic Shape of Girder Bridge / Bailey Bridge / Culvert

Girder Bridge (RC)



Portable Steel Bridge



Culvert

Sub-structure

Element		Temporary Parameter	Temporary Number of the Element				Remark
			Girder Bridge	Truss Bailey	Masonry Arch	Culvert	
14	Pier	Unknown	-	-	-	-	un-editable
15	Abutment	Unknown	-	-	-	-	un-editable
16	Foundation	Unknown	-	-	-	-	un-editable
17	Wing Wall	-	-	-	-	-	no need to input
18	Footing	-	-	-	-	1	
19	Side wall	-	-	-	-	2	

Bearings

Element		Temporary Parameter	Temporary Number of the Element				Remark
			Girder Bridge	Truss Bailey	Masonry Arch	Culvert	
20	Bearing (Steel)	Steel	only click on Checkbox	only click on Checkbox	-	-	un-editable
21	Bearing Seat/Bed	-	-	-	-	-	un-editable
22	Bearing (Rubber)	Rubber	-	-	-	-	un-editable

Deck Surface

Element		Temporary Parameter	Temporary Number of the Element				Remark
			Girder Bridge	Truss Bailey	Masonry Arch	Culvert	
23	Railing (Steel)	Steel	2	2	2	2	
24	Pavement	Asphalt	-	-	-	-	un-editable
25	Wheel Guard	-	2	2	2	2	
26	Railing (Concrete)	-	-	-	-	-	no need for temporary
27	Curb	-	-	-	-	-	no need for temporary

Other Elements

Element		Temporary Parameter	Temporary Number of the Element				Remark
			Girder Bridge	Truss Bailey	Masonry Arch	Culvert	
28	Drainage System	-	1	1	1	1	
29	Inspection Facilities	-	-	-	-	-	no need for temporary
30	Road sign	-	-	-	-	-	no need for temporary
31	Utility Pipe	-	-	-	-	-	no need for temporary
32	Lighting Facility	-	-	-	-	-	no need for temporary
33	Bridge Approaches	-	-	-	-	-	un-editable
34	Expansion Joint(Rubber)	-	-	-	-	-	
35	Expansion Joint(Steel)	-	only click on Checkbox	only click on Checkbox	-	-	un-editable
36	Retaining Wall	-	only click on Checkbox	only click on Checkbox	only click on Checkbox	only click on Checkbox	un-editable

---

< **Pictures** : for Bridge / Box Culvert>

No need to upload pictures before 1st Periodic Inspection.

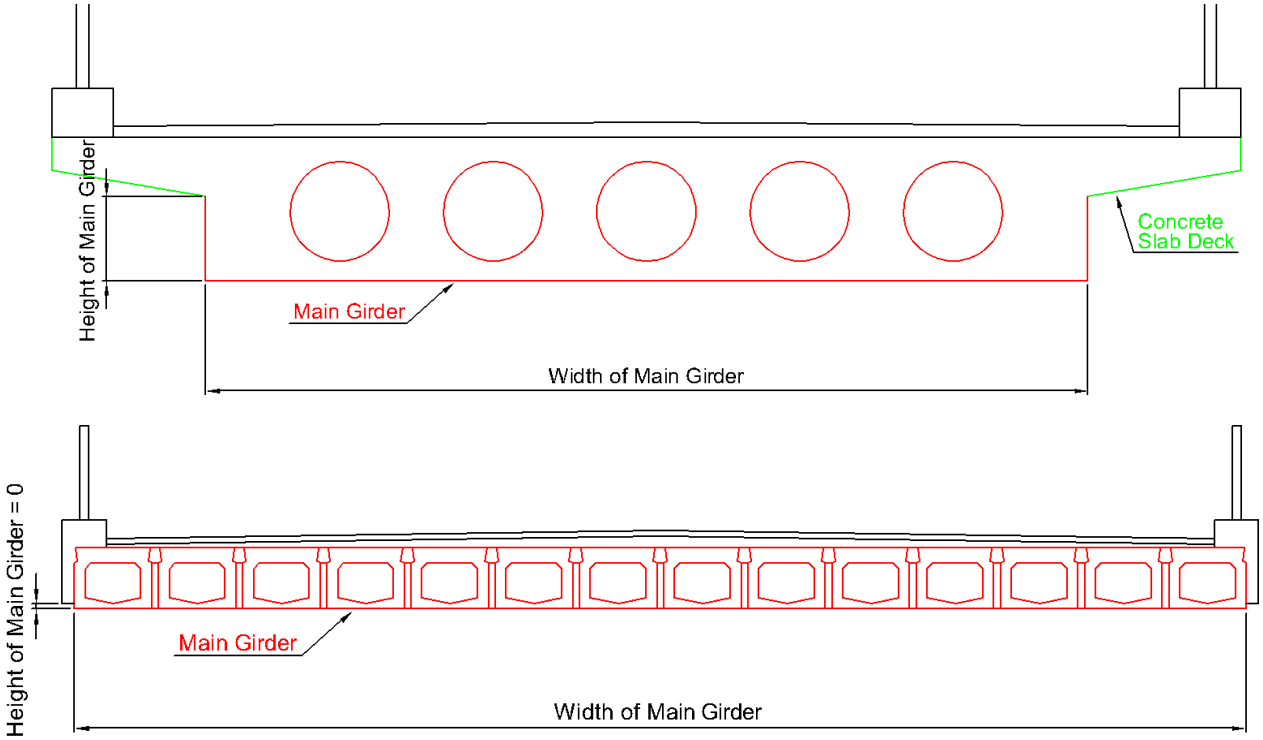
Chapter 5. Temporary input because of impossibility to get the information

This chapter shows formula to calculate temporary length of main girder or box culvert.
You can refer this chapter only if you completely unable to get length information in bridge site.

Only for popular bridge type in Bangladesh, this manual shows formula.

The length calculated with formula should be rounded up by first decimal place. e.g. 3.500 m

[Small Slab Bridge / RC Slab Bridge]



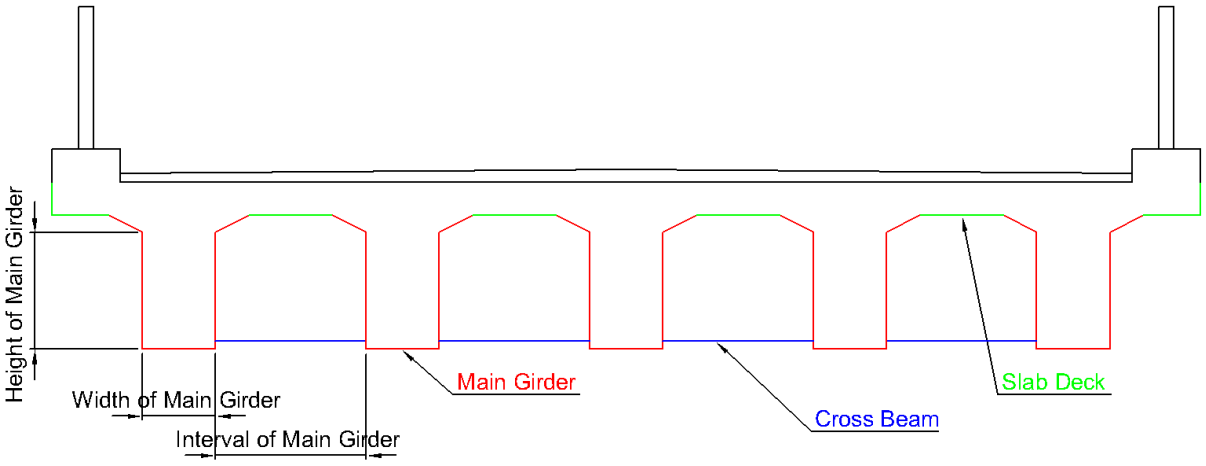
- Interval of Main Girder : input always "0".
- Height of Main Girder : Temporary = "0"
- Width of Main Girder : Temporary = "Effective Width"

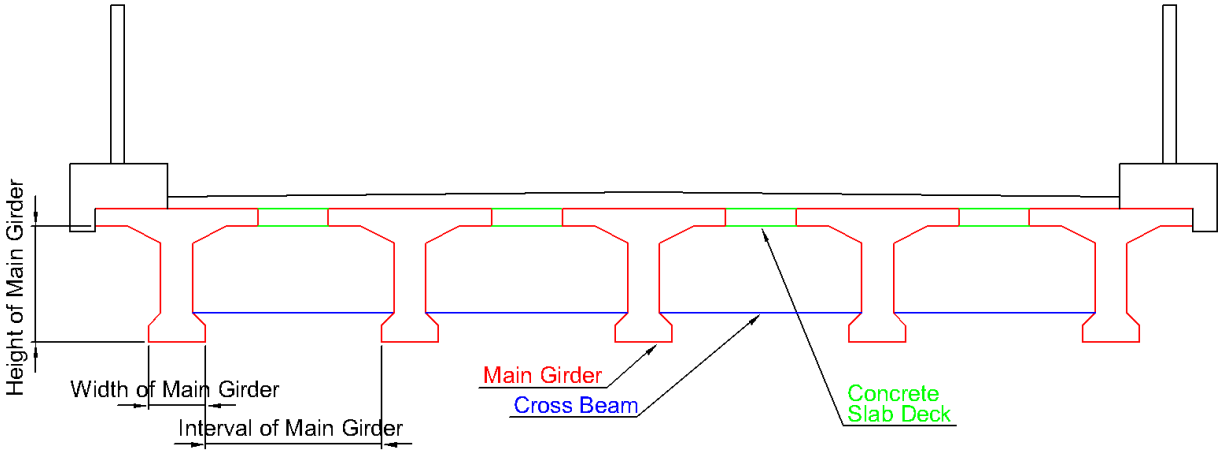
e.g. Temporary input case

If Effective width = 7.500m,

- Interval of Main Girder = 0.000m : always
- Height of Main Girder = 0.000m : temporary
- Width of Main Girder = 7.500m : temporary

[RC Girder Bridge / PC Girder Bridge]





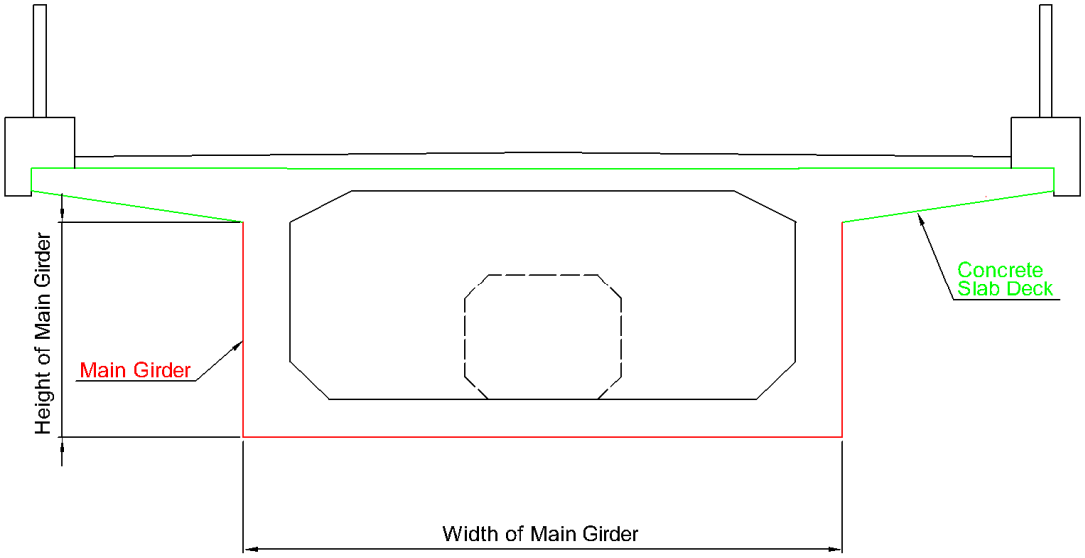
- Interval of Main Girder : Temporary = “Effective Width” / (“NO. of Main Girder” - 1)
- Height of Main Girder : Temporary = “Span Length” / 15
- Width of Main Girder : Temporary = 0.300 m

e.g. Temporary input case

If Span length = 30.000m, Effective width = 10.000m and Number of Main Girder = 5,

- Interval of Main Girder = 10.000m / (5-1) = 2.500m : temporary
- Height of Main Girder = 30.000m / 15 = 2.000m : temporary
- Width of Main Girder = 0.300m : temporary

[RC Box Girder Bridge / PC Box Girder Bridge]



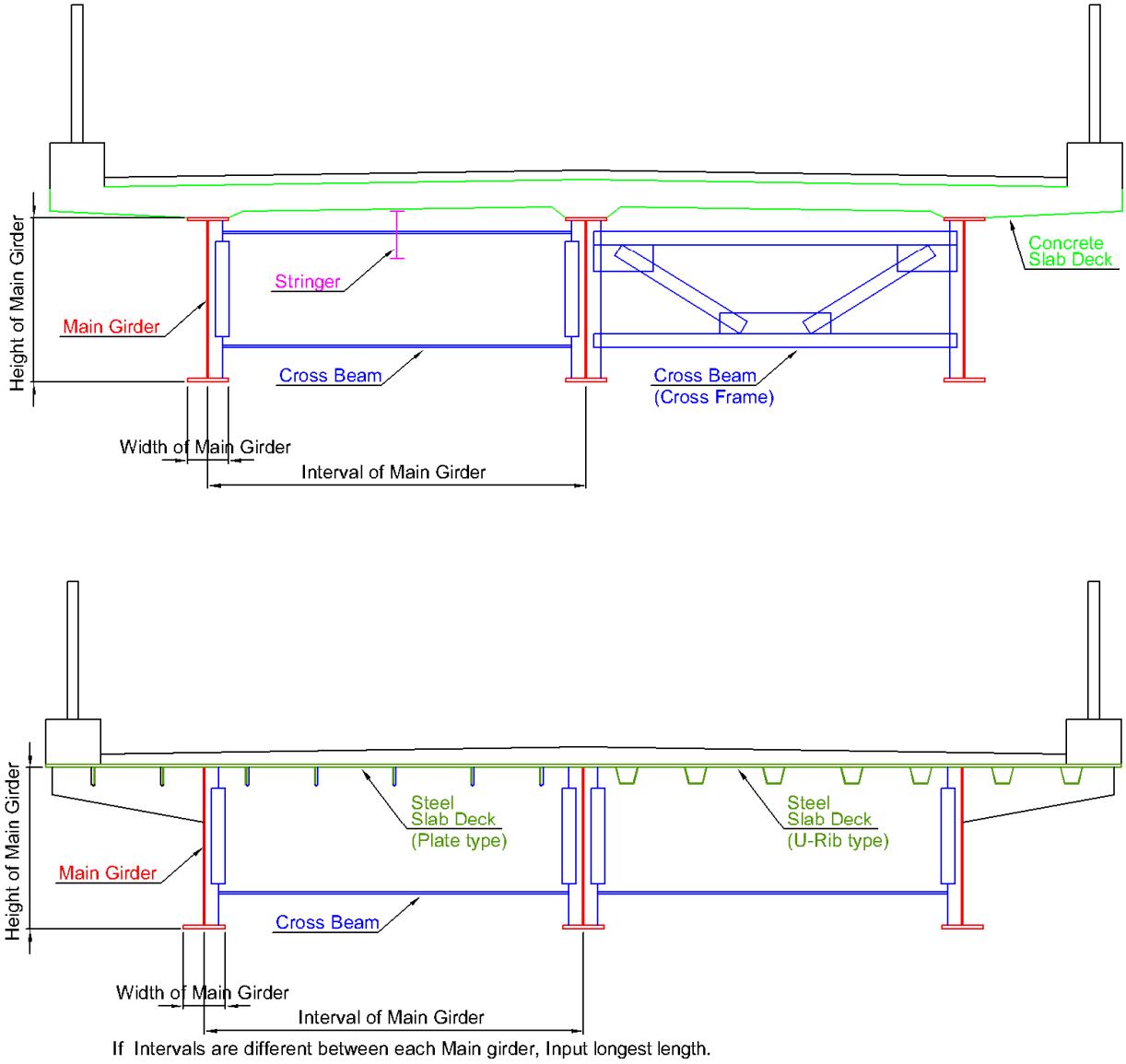
- Interval of Main Girder : input always "0"
- Height of Main Girder : Temporary = "Span Length" / 15
- Width of Main Girder : "Effective Width"

e.g. Temporary input case

If Span length = 30.000m and Effective width = 10.000m,

- Interval of Main Girder = 0.500m : always
- Height of Main Girder = 30.000m / 15 = 2.000m : temporary
- Width of Main Girder = 10.000m : temporary

[Steel Girder Bridge]



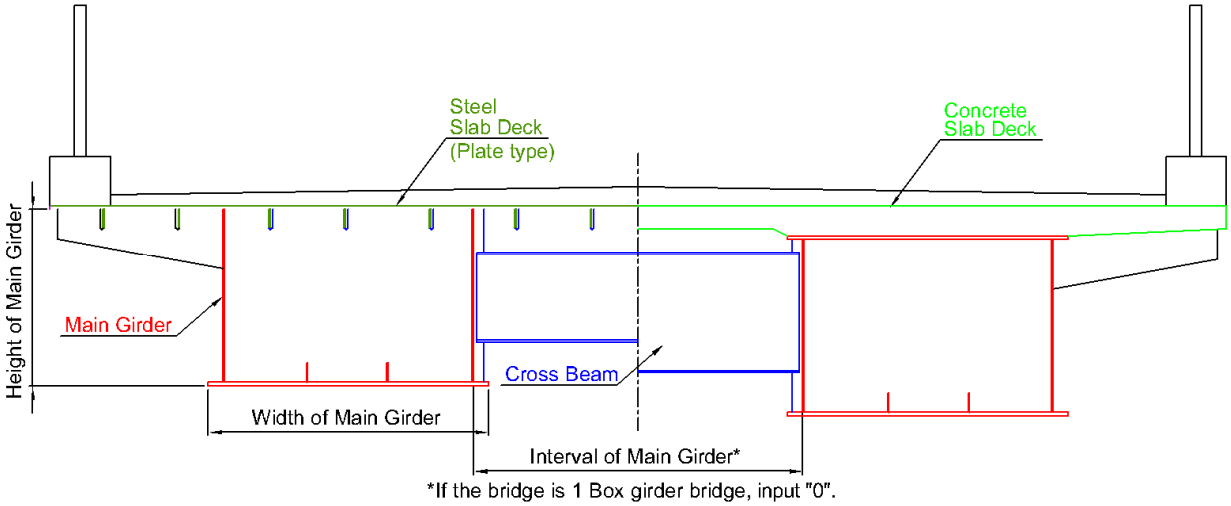
- Interval of Main Girder : Temporary = “Effective Width” / “NO. of Main Girder”
- Height of Main Girder : Temporary = “Span Length” / 15
- Width of Main Girder : Temporary = “Height of Main Girder” / 5

e.g. Temporary input case

If Span length = 30.000m, Effective width = 7.500m and Number of Main Girder = 3,

- Interval of Main Girder = 7.500m / 3 = 2.500m : temporary
- Height of Main Girder = 30.000m / 15 = 2.000m : temporary
- Width of Main Girder = 2.000m / 5 = 0.400m : temporary

[Steel Box Girder Bridge]



(Multiple box girders bridge)

- Height of Main Girder : Temporary = “Span Length” / 15
- Width of Main Girder : Temporary = 2.500m
- Interval of Main Girder : Temporary =
  “Effective Width” - “Width of Main Girder" x “NO. of Main Girder”

e.g. Temporary input case (Multiple main girder)

If Span length = 30.000m, Effective width = 10.000m and Number of Main Girder = 2,

- Height of Main Girder = 30.000m / 15 = 2.000m : temporary
- Width of Main Girder = 2.500m : temporary
- Interval of Main Girder = 10.000m - 2.500m x 2 = 5.000m : temporary

(Single box girders bridge)

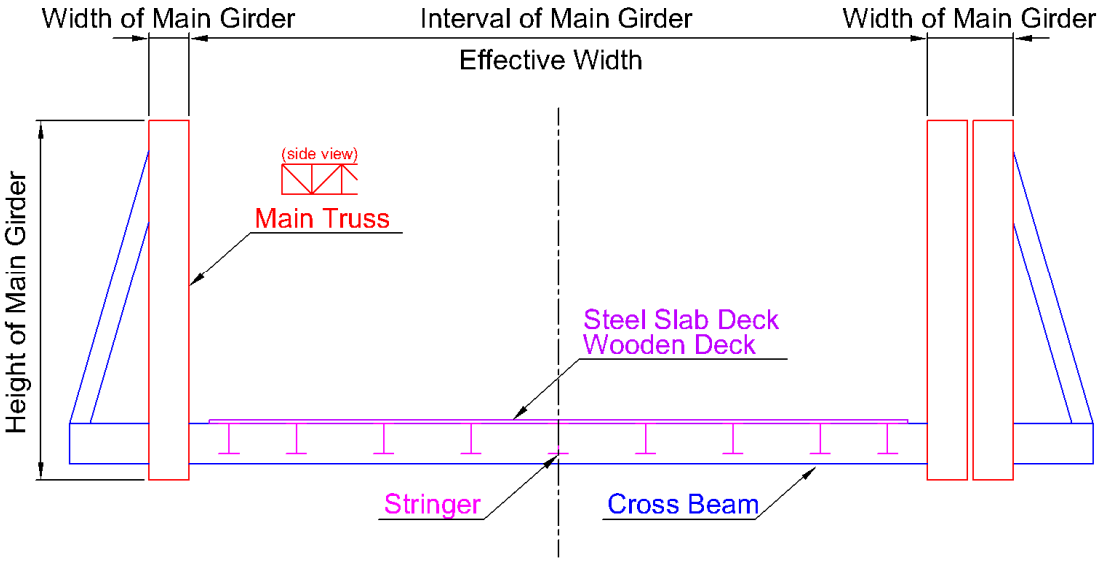
- Height of Main Girder : Temporary = “Span Length” / 15
- Width of Main Girder : Temporary = “Effective Width”
- Interval of Main Girder : input always “0”

e.g. Temporary input case (Multiple main girder)

If Span length = 30.000m, Effective width = 7.500m and Number of Main Girder = 1,

- Height of Main Girder = 30.000m / 15 = 2.000m : temporary
- Width of Main Girder = 7.500m : temporary
- Interval of Main Girder = 0.000m : temporary

[Truss Bridge / Portable Steel Bridge]

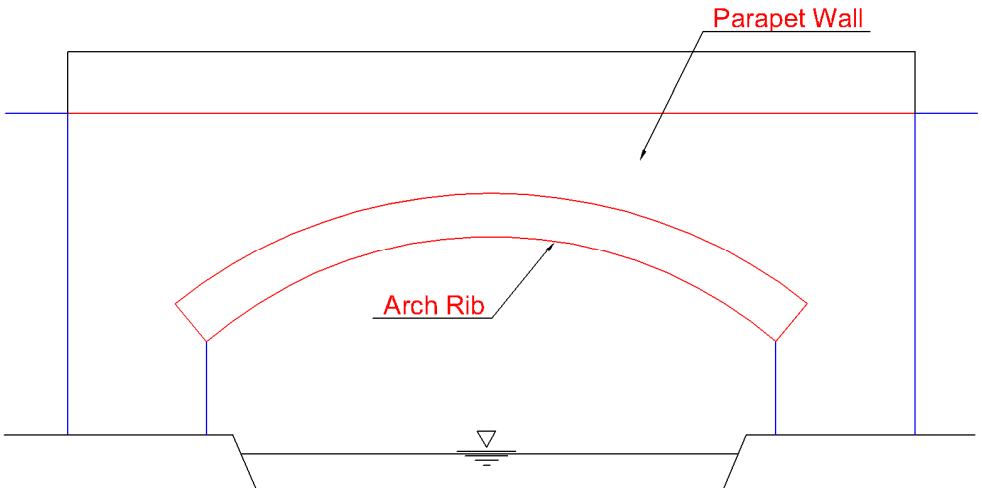


- Interval of Main Girder : always same as "Effective Width".
- Height of Main Girder : Temporary = 2.000 m
- Width of Main Girder : Temporary = 0.200 m

[Masonry Arch Bridge]

It is not necessary to input girder length of Masonry Arch Bridge because of following reason.

- The shape is markedly different from other bridge types. It is impossible to apply above inputting rules.
- Remedial measures in Bridge Rehabilitation/Strengthening Manual is not applied to Masonry Arch Bridge, because only this bridge is made with masonry. Therefore, this bridge type is not targeted to calculate rough cost estimate to remedy. It means length information to calculate is not required from BMS.



[Mixed Types Bridge]

This bridge type is not shown in Inspection & Evaluation Manual. Mixed Types Bridge is always multiple span bridge and defined as following,

- The bridge consists of multiple types of bridge.

e.g.

1st span : RC Girder Bridge, 2nd span : PC Box girder Bridge, 3rd span : RC Girder Bridge

- The bridge consists of multiple materials.

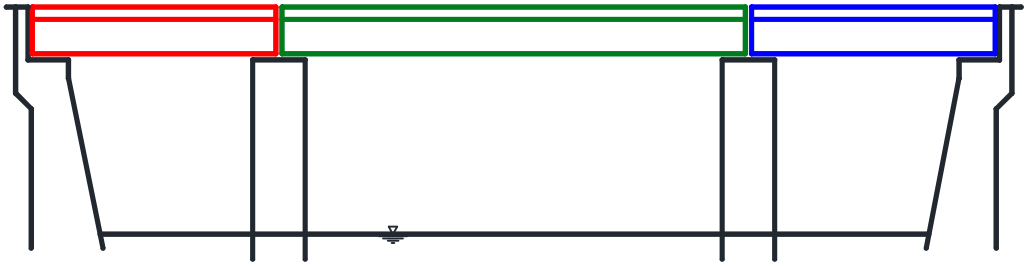
e.g.

1st span : RC Girder Bridge, 2nd span : Steel Girder Bridge, 3rd span : RC Girder Bridge

- The bridge consists of multiple types and materials.

e.g.

1st span : RC Girder Bridge, 2nd span : Steel Box Girder Bridge, 3rd span : RC Slab Bridge



Because only a type of bridge is enabled into BMS, this type is required to manage BMS.

Note

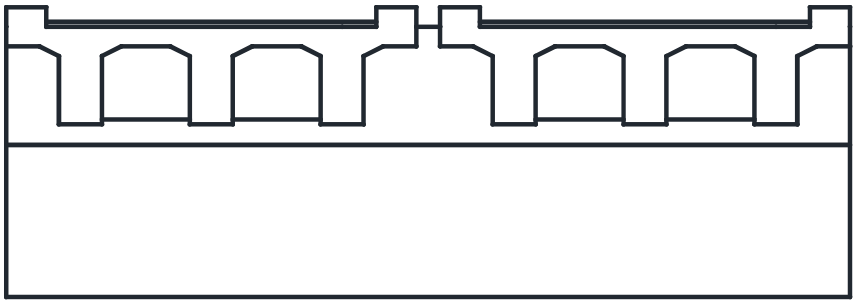
- Number of Main Girder, cross beam and so on of Basic Data should be inputted as maximum number of main girder in all spans.
- Inspection sheet and Evaluation sheet of Mixed Types Bridge consist of "All types of defects" (both of types of defects of "Concrete" or "Steel (rubber)".

  Cells of inspection sheet not required (e.g. concrete defect of steel element) should be inputted as "-".

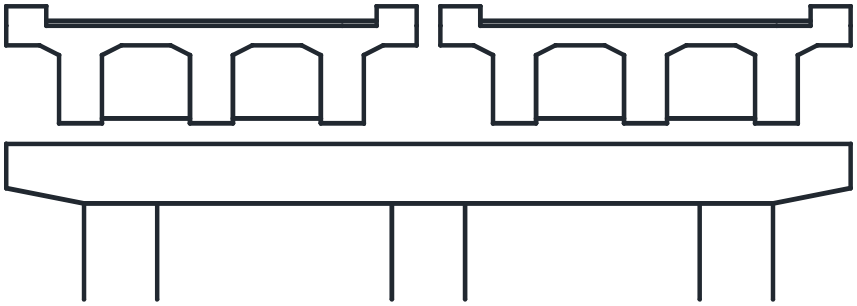
  Cells of evaluation sheet not required (e.g. concrete defect of steel element) should be inputted as "N".

[How to input Parallel bridge sharing one substructure]

In the case of "Parallel bridge (two bridges being built side by side.)", one substructure supports both of two superstructures like as following drawings.



e.g. One Abutment with parallel bridges



e.g. One Pier with parallel bridges

How to input the parallel bridges is shown as following.

- Parallel bridges should be registered as **TWO bridges**. (separated bridges)
- Bridge No. is inputted as following,

  Bridge locating upstream side : 12 letters (by GPS) + **1 (13th letter)**

  Bridge locating downstream side : 12 letters (by GPS) + **2 (13th letter)**

- Each substructure should be inspected as **ONE component**. However, BMS requires result of superstructure and substructure. Therefore, inputting result should be carried out as following,

  Bridge locating upstream side

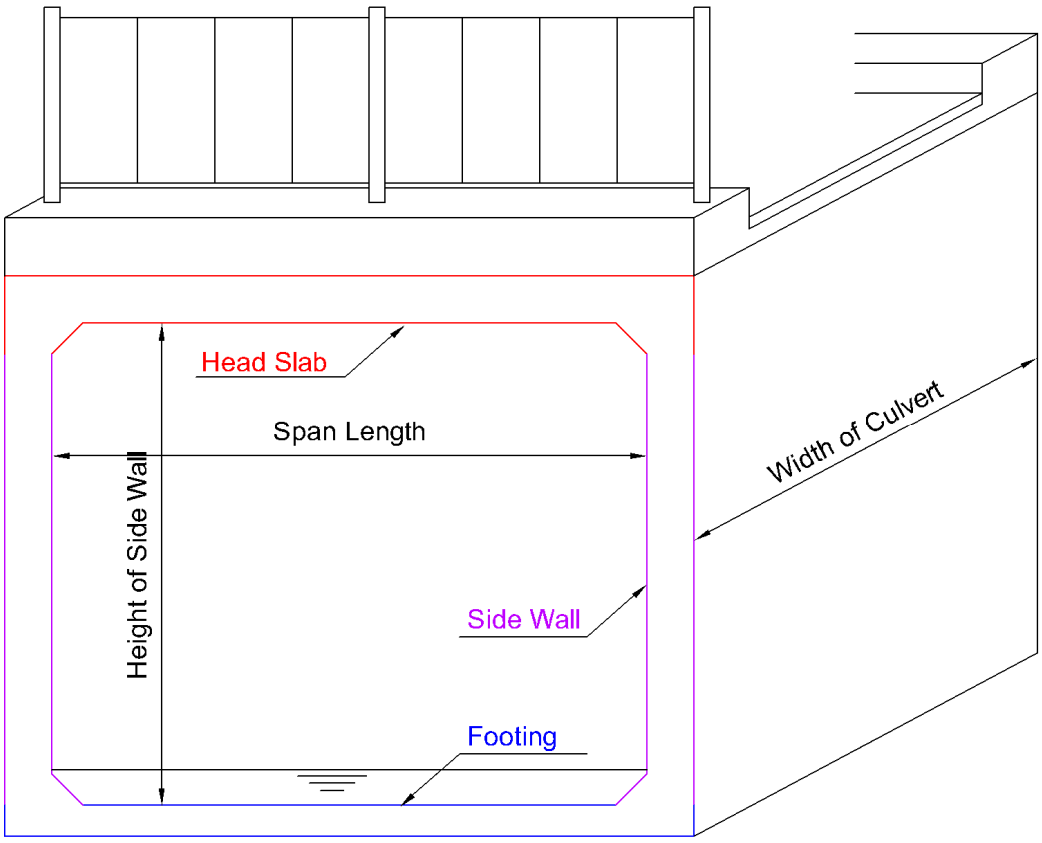
  : Result of the superstructure of upstream side + **Result of the substructure***

  Bridge locating downstream side

  : Result of the superstructure of downstream side + **Result of the substructure***

  * Result of the substructure is **same result**.

[Box Culvert]



- Width of Culver : Same as “Bridge Width”.
- Height of Side Wall : Temporary = 2.000 m

e.g. Temporary input case

If Bridge width = 7.500m,

- Width of Culver = 7.500m : temporary
- Height of Side Wall = 2.000m : temporary

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