

A P P E N D I X

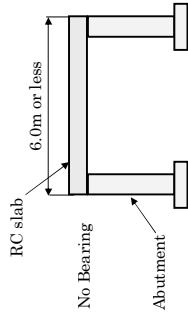
A P P E N D I X
BASIC KNOWLEDGE OF BRIDGE

Bridge and Culvert Type

<Concrete Bridge >

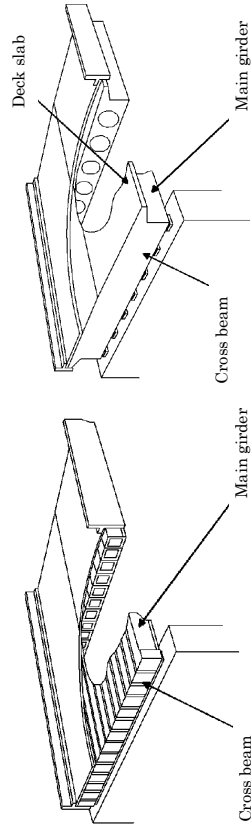
1. Small Slab Bridge (Former "Slab Culvert")

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.



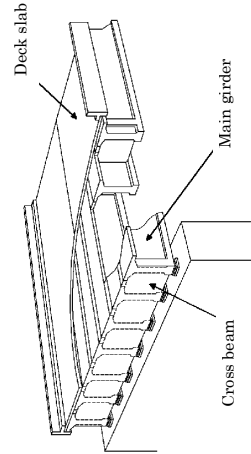
2. RC Slab Bridge

In general, the span is less than 16m



3. RC Girder Bridge

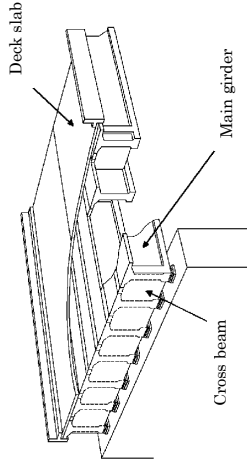
In general, the span is less than 20m. In special case It can be less than 30m



Bhuvagati Bridge in SirajGanj

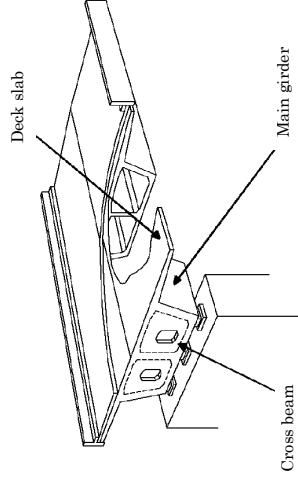
4. PC Girder Bridge

In general, the span is more than 20m



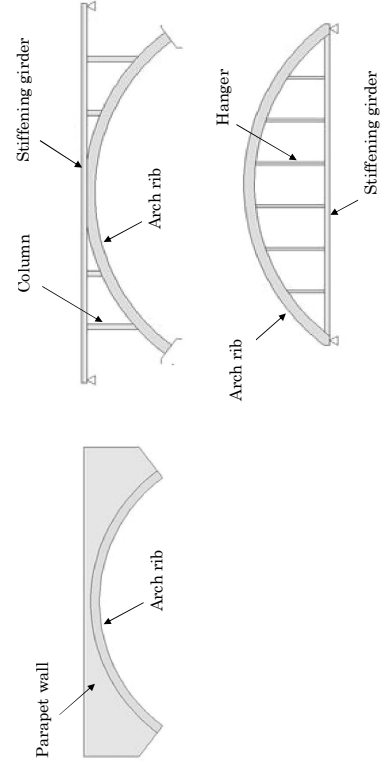
Kanchpur Bridge in Narayanganj

5. PC Box Girder Bridge

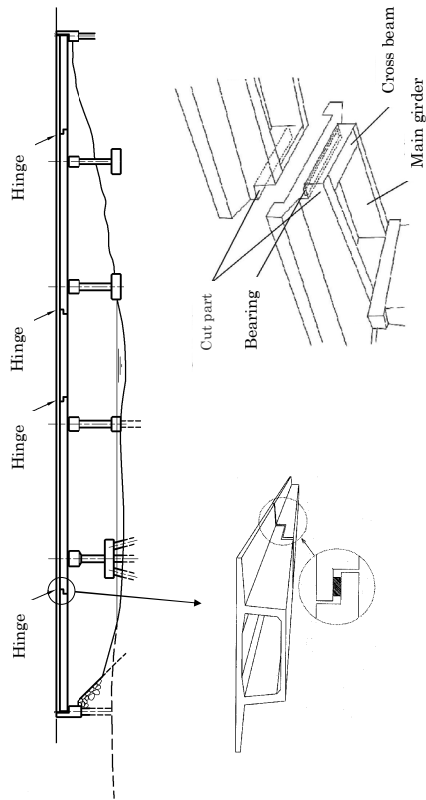


Rupsha Bridge

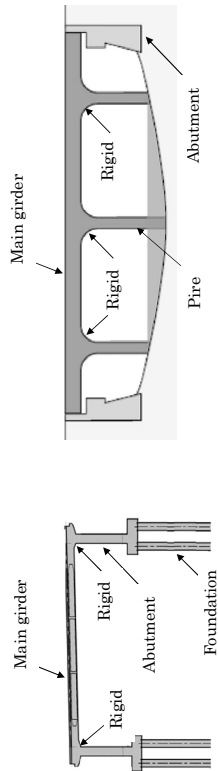
6. Concrete Arch Bridge



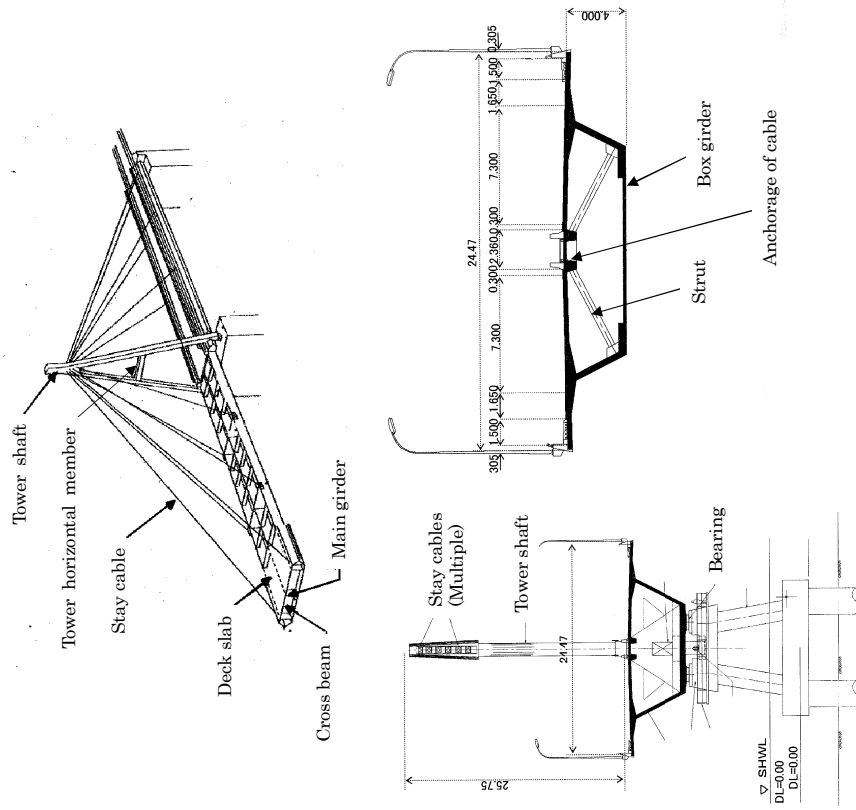
7. Cantilever Bridge with Hinge



8. Rigid Frame Bridge



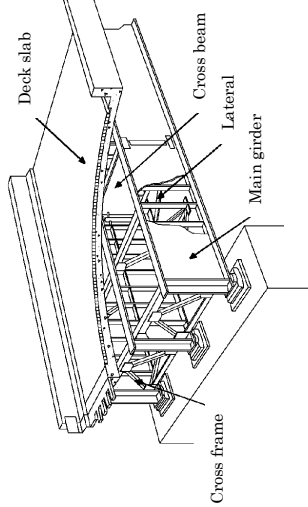
9. Cable- Stayed Bridge



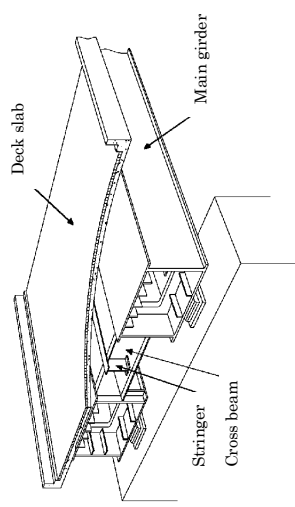
Section and elements of the 3rd Kamaphuli Bridge (Extradosed bridge)

< Steel Bridge >

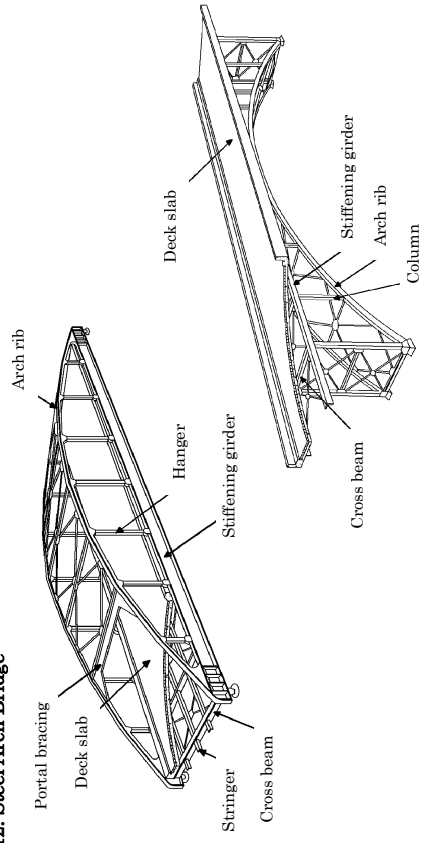
10. Steel Girder Bridge



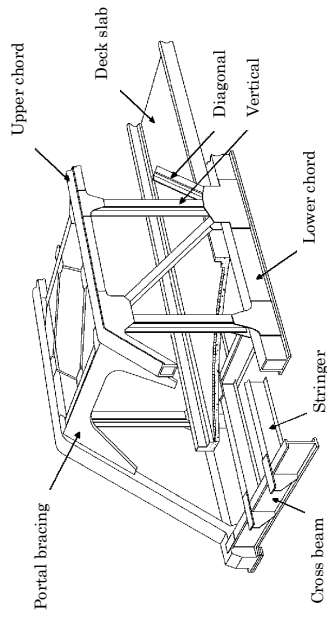
11. Steel Box Girder Bridge



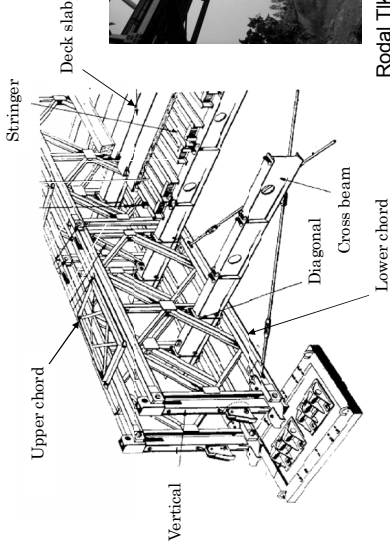
12. Steel Arch Bridge



- 13. Truss Bridge with Steel Deck
- 14. Truss Bridge with RC slab
- 15. Truss Bridge with Timber Deck



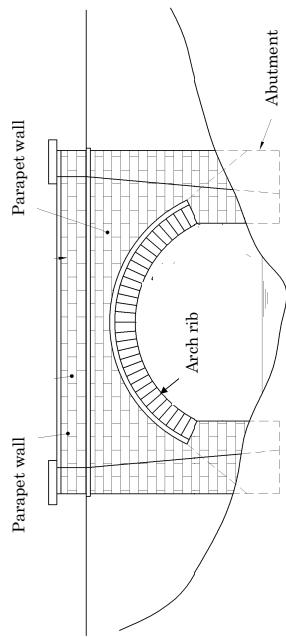
- 16. Portable Steel Bridge with Steel Deck
- 17. Portable Steel Bridge with Timber Deck



Rodal Tiki Portable Steel Bridge in Manikganj

< Masonry Arch Bridge >

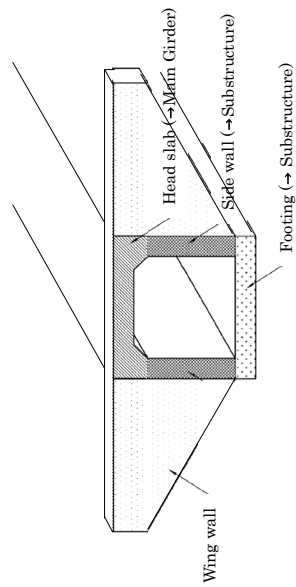
18. Masonry Arch Bridge



< Culvert >

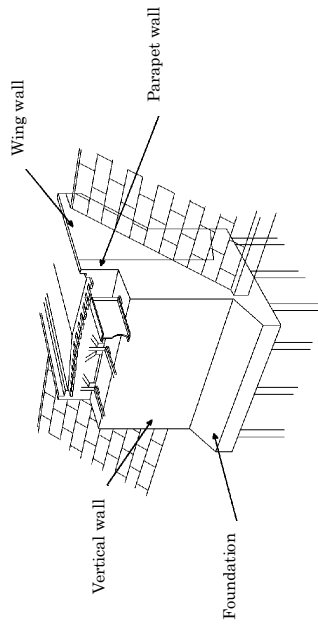
19. Box Culvert

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.

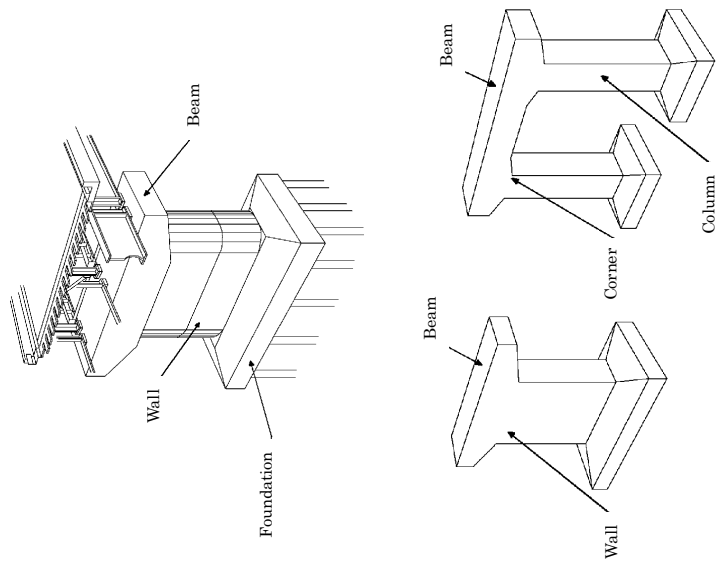


Substructure Type

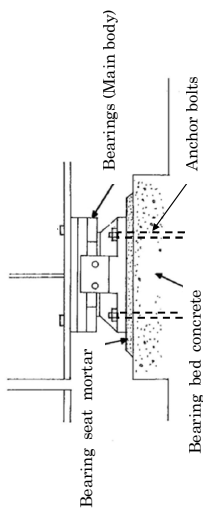
< Abutment >



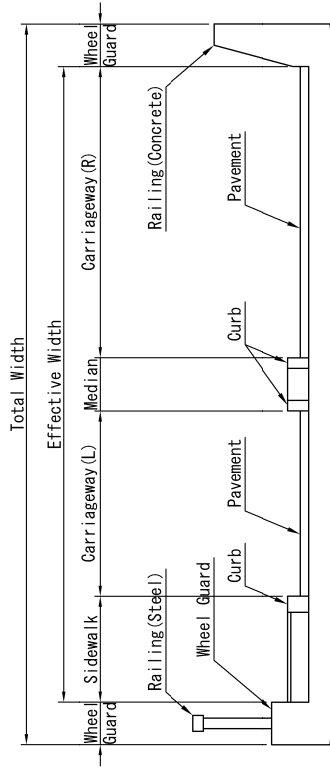
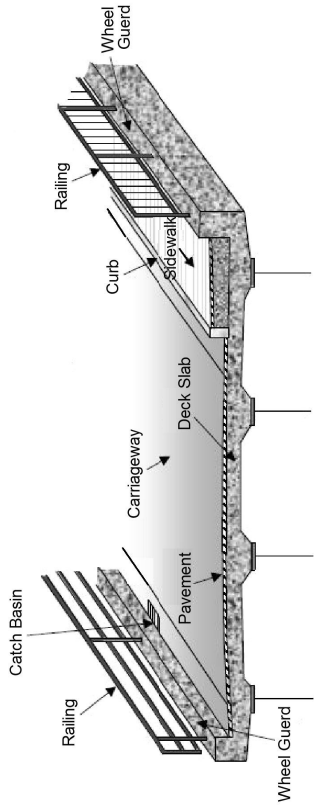
< Pier >



Bearings

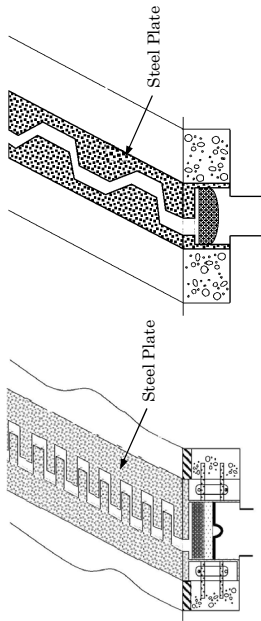


Deck Surface

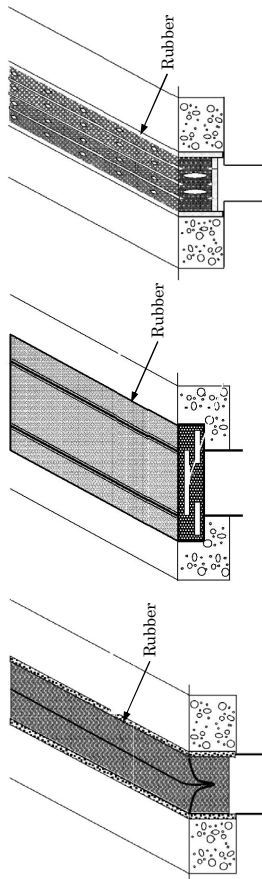


Expansion Joint

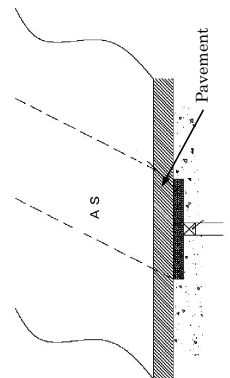
<Steel>



<Rubber>



<Others>



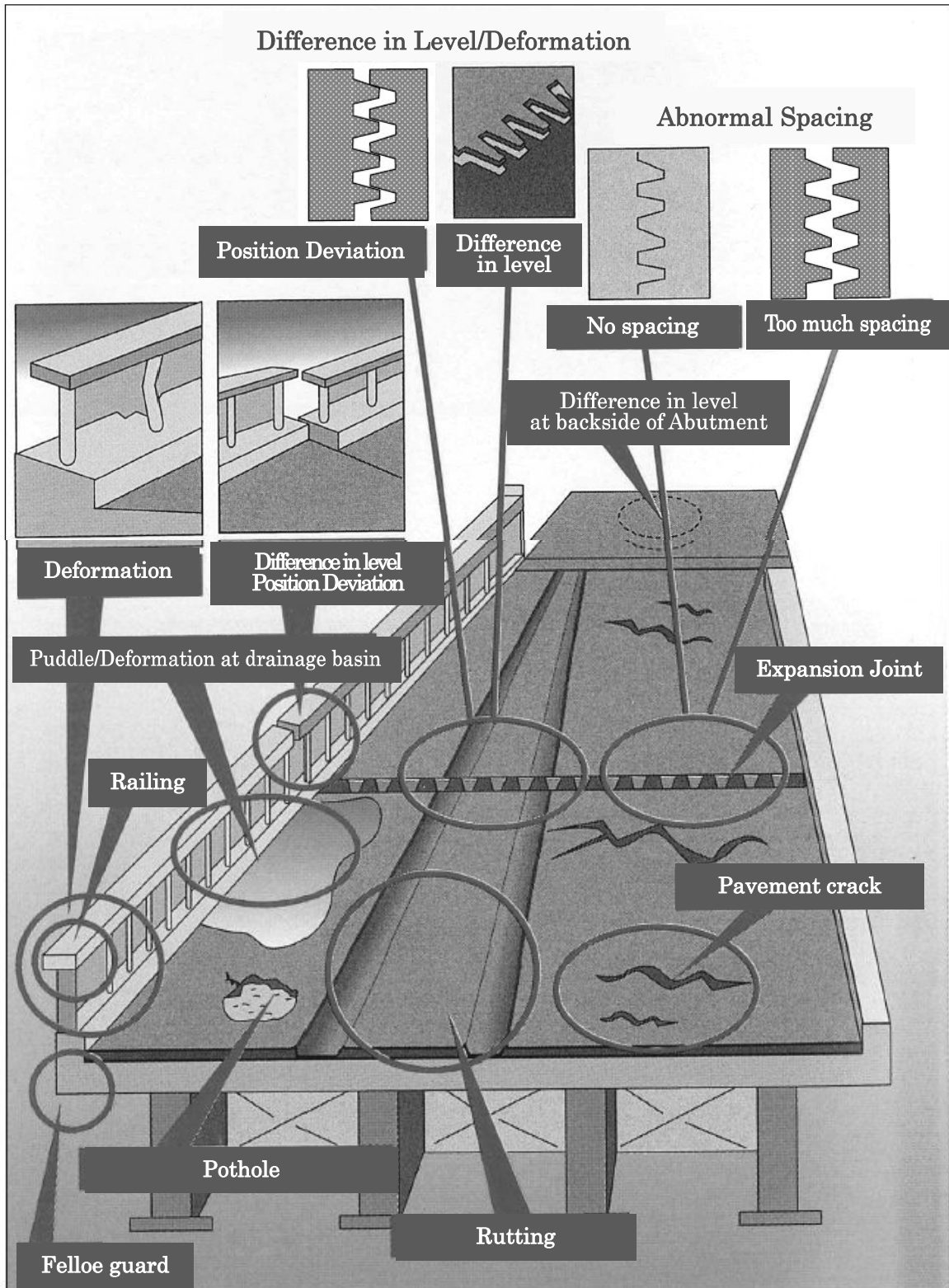


Figure Summary of Possible Defects and Locations

A P P E N D I X

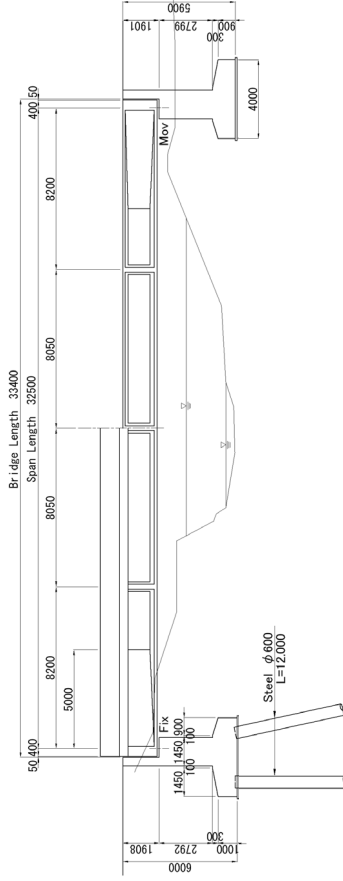
RECORDING OF INVENTORY AND RESULT

Periodic Inspection/Evaluation Report Form (Sample)

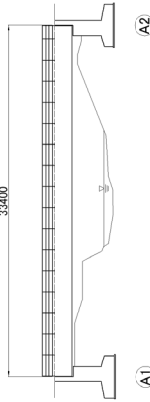
File Number		Inspector			Date		
N1, 8b	Dhaka	Circle	Dhaka	Division	Narayanganj-1	Sub-Division	Narayanganj-1
District		Upazilla		Union		Village	
Road No.	N1	Road Name	Dhaka(Jatrabari)-Comilla-Chittagong-Taknaf	LRP Name	8b	Lat	284-42-7.5"
Bridge Name	Yamato Bridge	LRP-Offset (m)	5-3976	Chainage (km)	8.976	Long	904-30-57.3"
Year of Construction	1972	Design Standard		TL-20		Load Restriction	(ton)
Feature Intersected	River	Owner	Public Utilities Carried	telephone line		water	Owner
Bridge Length	33.4	No. of Spans	1	Span Arrangement	33.4	Skew Angle (degree)	85
Superstructure	PC Girder Br	Material	Concrete	Deck Slab	RC	Type	Material
Substructure	Abutment	Material	Concrete	Foundation (Abutment)	Pile Foundation		Concrete
	Pier	Material	Concrete	Foundation (Pier)	...		Steel
Other Elements	Pavement	Material	Asphalt	Bearings	Rubber		
	Expansion Joint	Material	Steel	Railing	Others		
Total Width	12.8 m	Wheel Guard-L	0.5 m	Carriage way-L	5.5 m	Median	4.5 m
Effective Width	12.0 m	Wheel Guard-R	0.5 m	Carriage way-R	5.5 m	Sidewalk-L	0.0 m
Traffic Conditions						Sidewalk-R	0.3 m
		Census (year)	2014	Heavy Vehicle Traffic Rate (%)	0~10	0.3 m	0.0 m
		Traffic Volume	10,600	Condition Category for Entire Bridge	0~10	0.3 m	0.0 m
				Vehicles (Daytime 12 hours)	85		

General Drawings	
Bridge Number	Yamato Bridge
Bridge Name	Yamato Bridge
Route Name	

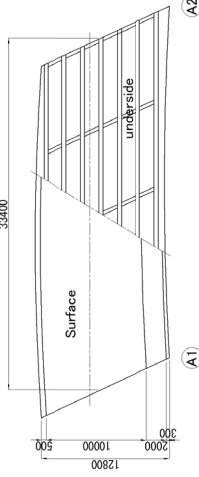
General View



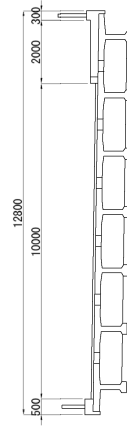
Side View



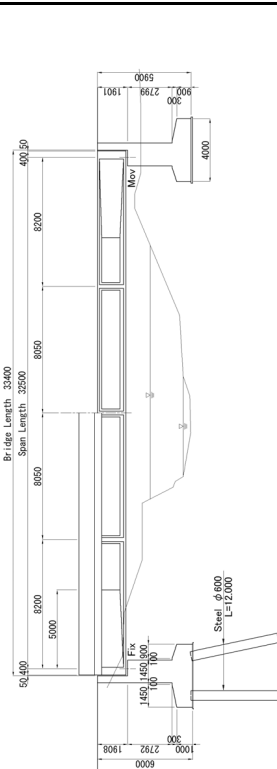
Plan



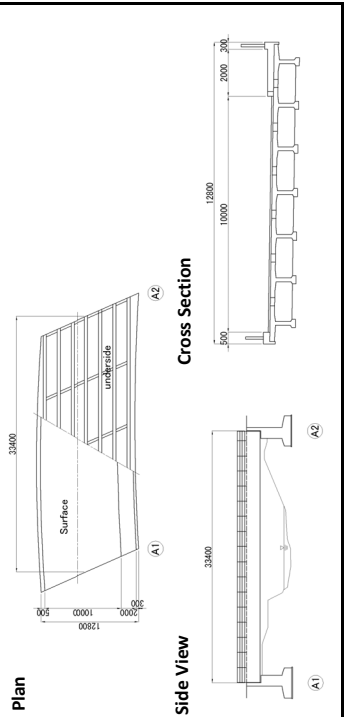
Cross Section



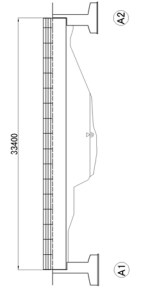
General View



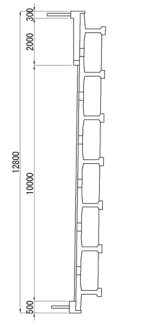
General View of the Span



Side View



Cross Section



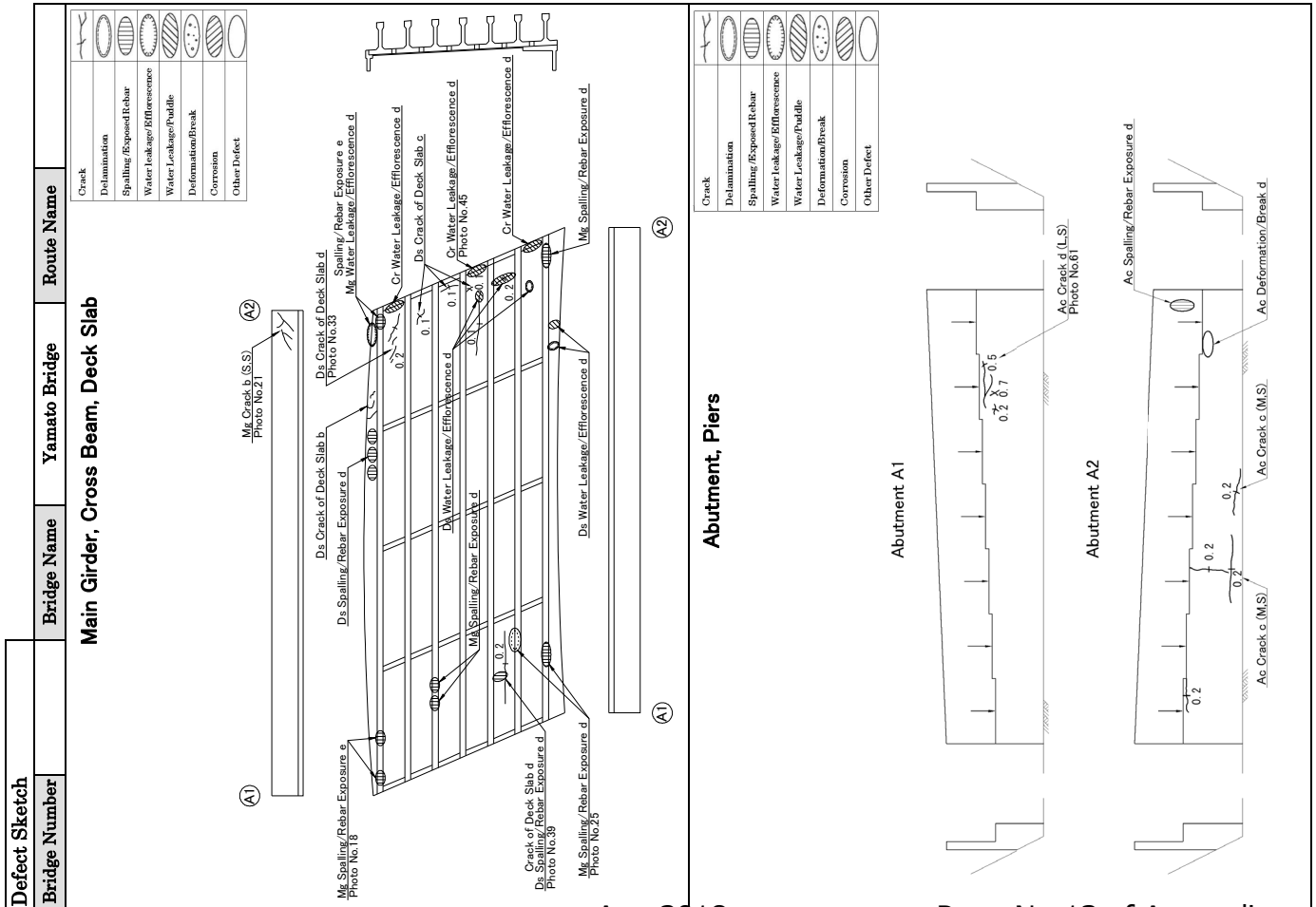
Element Numbering System		Bridge Name	Route Name	Span No.
Bridge Number		Yamato Bridge		1
Main Girder (Mg)				
(A)	(A)	(A)	(A)	(A)
Cross Girder (Ct)				
(A)	(A)	(A)	(A)	(A)
Substructure				
Abutment (A), Foundation (F)				
(A)	(A)	(A)	(A)	(A)
Bearings (Bh)				
(A)	(A)	(A)	(A)	(A)
Railing (Ra), Wheel Guard (Wg)				
Expansion Joint (Ej), Curb (Cb), Pavement (Pm)				
(A)	(A)	(A)	(A)	(A)

Overall View Photo	Bridge Number	Bridge Name	Yamato Bridge	Route Name	Side View	
					Viewpoint	Date
					Viewpoint	
					Date	
					Viewpoint	
					Date	
					Viewpoint	
					Date	

Defect Photos			
Bridge Number	Bridge Name	Yamato Bridge	Route Name
Span No.	Element	Span No.	Element
1	Main Girder	18	Main Girder
1	Photo No.	1	Photo No.
1	Defect	1	Defect
1	Rating	1	Rating

Defect Photos			
Span No.	Element	Span No.	Element
1	Main Girder	25	Spalling/Rebar Exposure
1	Photo No.	25	Photo No.
1	Defect	25	Defect
1	Rating	25	Rating

Defect Photos			
Span No.	Element	Span No.	Element
1	Deck Slab	38	Crack of Deck Slab
1	Photo No.	38	Photo No.
1	Defect	38	Defect
1	Rating	38	Rating



Periodic Inspection Report Form

File Number	Zone	Inspector		Date																									
		Bridge Name	Yamato Bridge	Superstructure	PC Girder Bridge	Year																							
Survey Result		Circle	Division	No. of Hinge	Span Length	Sub-Division																							
		Steel Material			Common																								
		Concrete Material			Common																								
Items of Defects		01	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	Remarks
		Main Girder																											
		Main Girder																											
		Main Girder																											
		Main Girder																											
		Main Girder																											
		Main Girder																											
		Cross Beam																											
		Cross Beam																											
		Cross Beam																											
		Cross Beam																											
		Cross Beam																											
		Cross Beam																											
Deck Slab (RC)																													
Deck Slab (RC)																													
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Deck Slab (RC)																													
Deck Slab (RC)																													
Deck Slab (RC)																													
Abutment																													
Abutment																													
Foundation (RC)																													
Foundation (RC)																													
Bearing																													
Bearing																													
Expansion Joint (Rubber)																													
Railing (Steel)																													
Wheel Guard																													
Drainage System																													
Pavement																													
Bridge Approaches																													
Bridge Approaches																													
Lighting Facility																													
Utility Pipe																													
Summary and Recommendation																													

Bridge Evaluation Report Form

File Number	Zone	Inspector		Date																									
		Bridge Name	Yamato Bridge	Superstructure	PC Girder Bridge	Year																							
Evaluation Result		Circle	Division	No. of Defects	Span No.	Sub-Division																							
		Steel Material			Common																								
		Concrete Material			Common																								
Superstructure		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	Remarks	
		Main Girder																											
		Main Truss																											
		Main Arch																											
		Outer Cable																											
		Main Tower																											
		Arch Rib																											
		Top Slab																											
		* Primary element																											
		Cross Beam																											
		Stringer																											
		* Primary element																											
		Lateral Bracing																											
		* Primary element																											
		Secondary element																											
		Deck Slab																											
		* Primary element																											

Bridge Evaluation Report Form

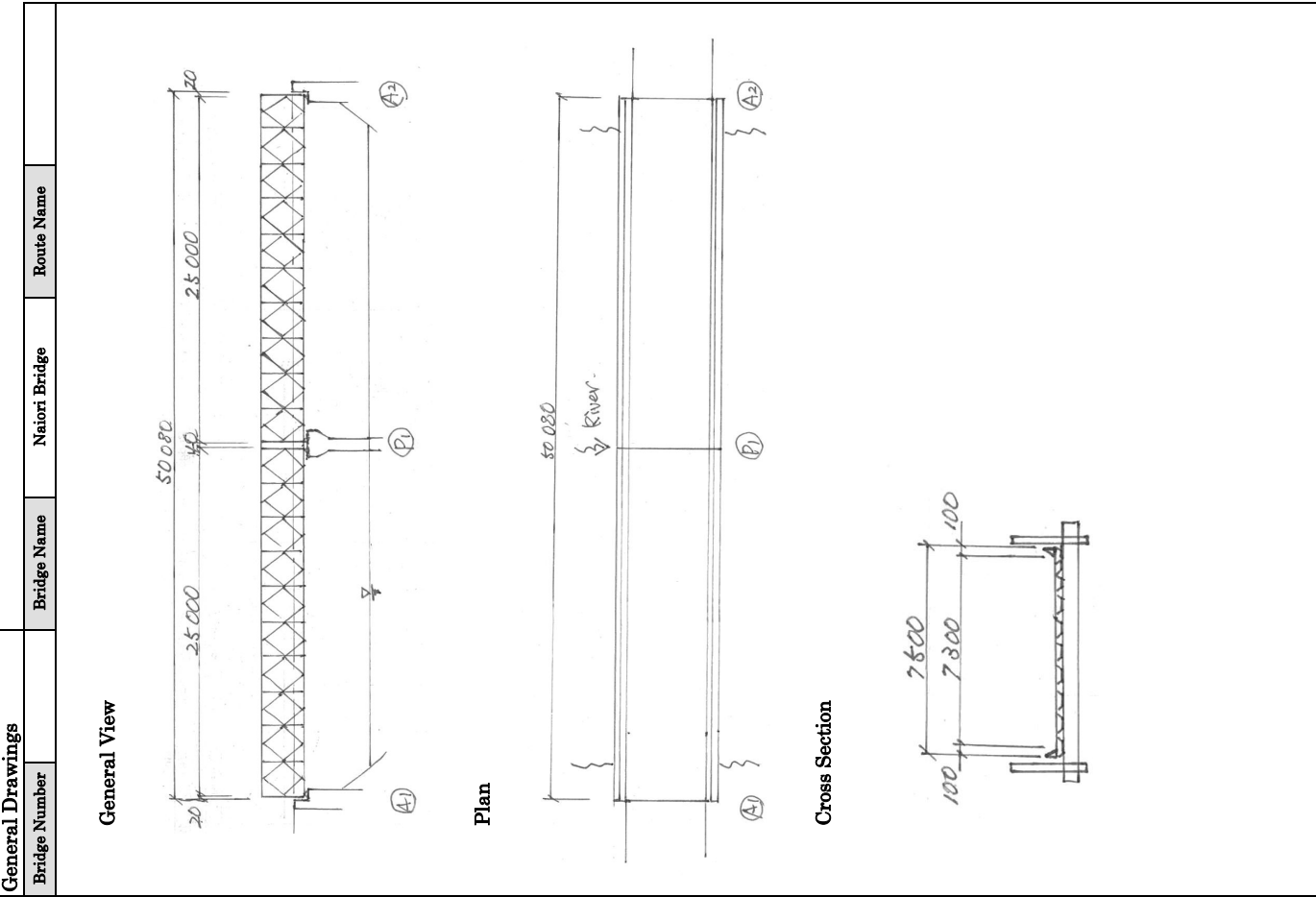
File Number Zone	Bridge Name Circle	Yamato Bridge	Superstructure		PC Girder Bridge	Date		
			Division	Sub-Division		Year	1972	
Element Type	Material	Type of Defects	AT No Repair	Span No. BT Minor Repair	CT Major Repair	DI Emer- gency	Page No. Detailed investi- gation	Remarks
Component		1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination 18. Other Types of Defects					2/3	
	Abutment							
	Pier							
	Side Wall	Concrete						
	Parapet Wall	Others						
	* Primary element	17. Defects of Reinforcing material 19. Discoloration / Deterioration 20. Water Leakage / Puddle 21. Abnormal Noise / Vibration 23. Deformation / Break						
Substructure	Foundation	Steel						
	Footing	Concrete						
	* Primary element	1. Corrosion 2. Crack in Steel 5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 16. Other Types of Defects 25. Settlement / Tilt / Movement 26. Scouring						
	Retaining Wall	Concrete						
	- Secondary element	6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination 16. Other Types of Defects 17. Defects of Reinforcing material 19. Discoloration / Deterioration 23. Deformation / Break 25. Settlement / Tilt / Movement 26. Scour						
Bearings	Bearing Main Body	Steel (Rubber)						
	Anchor Bolts	Others						
	* Primary element	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 12. Abnormal Spacing 15. Function Disorder of Bearings 16. Other Types of Defects 20. Water Leakage / Puddle 21. Abnormal Noise / Vibration 23. Deformation / Break 24. Accumulation of Debris 25. Settlement / Tilt / Movement 26. Crack						
	Bearing Seat Mortar	Concrete						
	Bearing Bed concrete	Others						
	* Primary element	20. Water Leakage / Puddle 23. Deformation / Break						

Bridge Evaluation Report Form

File Number Zone	Bridge Name Circle	Yamato Bridge	Superstructure		PC Girder Bridge	Date		
			Division	Sub-Division		Year	1972	
Element Type	Material	Type of Defects	AT No Repair	Span No. BT Minor Repair	CT Major Repair	DI Emer- gency	Page No. Detailed investi- gation	Remarks
Component		13. Difference in Level 14. Abnormal Bituminous Pavement 16. Other Types of Defects 24. Accumulation of Debris					3/3	
	Pavement	Others						
	- Secondary element	Common						
	Bridge Approaches	Others						
	- Secondary element	Common						
	Expansion Joints (Rubber/Steel)	Steel (Rubber)						
	- elements of post-cast concrete	Concrete						
	- Secondary element	Others						
	Railing (Steel / Concrete)	Steel						
	Wheel Guard (Concrete)	Concrete						
	- Guard Fence	Others						
	- Median	Common						
	- Curb	Common						
	- Secondary element	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination 16. Other Types of Defects 19. Discoloration / Deterioration 23. Deformation / Break						
	Drainage System	Steel Polyvinyl						
	- Catch-Basin	Others						
	- Drainage Pipe	Common						
	- Secondary element	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 16. Other Types of Defects 19. Discoloration / Deterioration 20. Water Leakage / Puddle 23. Deformation / Break 24. Accumulation of Debris						
	Lighting Facility	Steel						
	Road Sign Facility	Others						
	- Secondary element	Common						
	Inspection Facility	Steel						
	Utility Pipe	Others						
	- Secondary element	Common						

Periodic Inspection/Evaluation Report Form (Sample)

File Number	Rajshahi		Circle	Fabna	Division	Sirajganj	Inspector	Sirajganj	Date	Sub-Division	Sirajganj-1	
Zone	Rajshahi		Upazilla		Union					Village		
District	Rajshahi		Nalka-Sirajganj Road		LRP Name	LRP001	LRP	LRP001	Lat	24°-25'-47"	Long	89°-36'-4"
Road No.	R461		Nalka-Sirajganj Road		LRP Name	LRP001	LRP	LRP001	Chainage (km)	0.907		
Bridge Name	Natori Bridge		LRP-Offset (m)		Design Load		Load Restriction	Restriction	Owner	(ton)		
Year of Construction	1990		Design Standard		Design Load		Restriction	Restriction	Owner	(ton)		
Feature Intersected	River		Owner		Public Utilities Carried		Restriction	Restriction	Owner	(ton)		
	Road		Owner		Public Utilities Carried		Restriction	Restriction	Owner	(ton)		
	Railway		Owner		Public Utilities Carried		Restriction	Restriction	Owner	(ton)		
Bridge Length	50.08		No. of Spans	2	Span Arrangement	25+25	Skew Angle (degree)	90				
Superstructure	Portable Steel Bridge with Steel Deck		Type	Material	Type	Material						
Abutment	Inverted T-type		Concrete	Concrete	Foundation (Abutment)	Piled	Foundation (Pier)	Piled	Bearings	Steel	Steel	
Pier	Wall Type		Concrete	Concrete	Foundation (Pier)	Piled	Bearings	Steel	Steel	Steel	Steel	
Pavement	None		None	None	Railing	None	Carriage way-L	7.80 m	Median	0.0 m	Carriage way-R	0.0 m
Expansion Joint	None		None	None	Railing	None	Carriage way-L	7.80 m	Median	0.0 m	Carriage way-R	0.0 m
Total Width	7.60 m		Wheel Guard-L	0.1 m	Sidewalk-L	0.0 m	Carriage way-L	7.80 m	Median	0.0 m	Sidewalk-R	0.1 m
Effective Width	6.05 m		Wheel Guard-L	0.1 m	Sidewalk-L	0.0 m	Carriage way-L	7.80 m	Median	0.0 m	Sidewalk-R	0.1 m
Width	6.05 m		Wheel Guard-L	0.1 m	Sidewalk-L	0.0 m	Carriage way-L	7.80 m	Median	0.0 m	Sidewalk-R	0.1 m
Traffic Conditions	Census (year)		Traffic Volume		Vehicles (Daytime 12 hours)		Heavy Vehicle Traffic Rate (%)		Condition Category		35	
	2010		35		35		0~10~10~20~30~30~30~		B		B	



Element Numbering System		Bridge Name	Naiori Bridge	Route Name	Span No.
Bridge Number					1
<p>Main Truss (Mt) Deck Slab (Ds)</p>					
<p>Cross Beam (Cb), Lateral Bracing (Lb)</p>					
<p>Substructure Abutment(A), Foundation(F)</p>					
<p>Bearing(Br)</p>					
<p>Curb(Cb) Expansion Joint (Ej), Pavement (Pm)</p>					

Overall View Photo	Bridge Number	Bridge Name	Naiori Bridge	Route Name	Side View	
					Viewpoint	Date
					Viewpoint	23.08.15
					Date	
					Viewpoint	23.08.15
					Date	
					Viewpoint	Under Bridge
					Date	23.08.15

Defect Sketch		Bridge Number	Bridge Name	Nairobi Bridge	Route Name

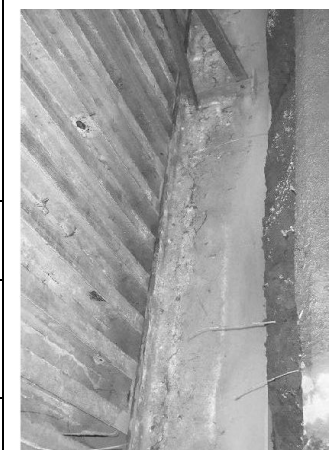
Element Numbering System		Bridge Number	Bridge Name	Nairobi Bridge	Route Name	Span No.
<p>Main Truss (Mt) Deck Slab (Ds)</p> <p>Cross Beam (Cb), Lateral Bracing (Rb)</p> <p>Substructure Abutment(A), Pier(P), Foundation(F)</p> <p>Bearing(Br)</p> <p>Curb(Cb) Expansion Joint (Ej), Pavement (Pm)</p>						


Periodic Inspection Report Form

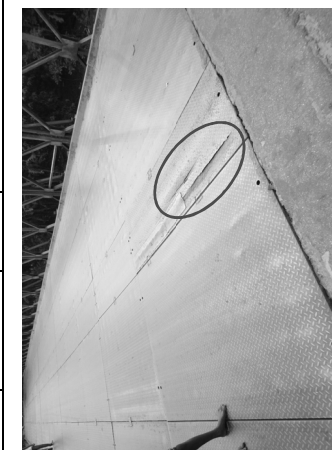
Inspector HARAZAKI, Iku Date 23.08.15

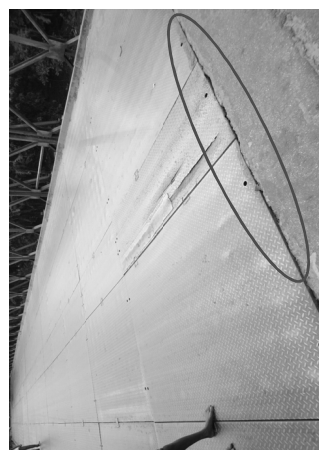
File Number	Naioiri Bridge		Superstructure PSB with Steel Deck		Year																							
Zone	Rajshahi	Circle	Pabna	Division	Sirajganj																							
Survey Result		No. of Hinge		Span Length	Span No.																							
		0		25.0	1																							
Items of Defects	Steel Material				Concrete Material							Others					Common							Remarks				
	Corrosion	Crack	Loose or Missing Bolts	Fracture	Deterioration of Paint System	Crack	Spalling/Exposed Rebar	Water Leakage/Bleed	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	
Main Truss	01				5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26		
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	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																											
Lateral Bracing	01	C																										
Deck Slab (Steel)	01																											
Abutment / Pier (RC)	01																											
Foundation (RC)	01																											
Retaining Wall	01																											
Bearing	01																											
Expansion Joint (Steel)	01																											
Curb	01																											
Pavement	01																											
Bridge Approaches	01																											
Summary																												
Recommendation																												

Defects Photos				Naioiri Bridge			Route Name					
Span No.	Element	Photo No.	Defect	Span No.	Element	Photo No.	Defect	Span No.	Element	Photo No.	Defect	Rating
1	Deck Slab	1	Corrosion	1	Deck Slab	1	Break	2	2			
1	Bearing	3	Accumulation of debris	3	Expansion Joint	4	Difference in Level	4	4			









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

Bridge Evaluation Report Form

File Number Zone	Rajshahi	Bridge Name Circle	Naiori Bridge Pabna	Superstructure Division	Sub-Structure Division	Sirajganj Sub-Division	Sub-Deck Sub-Division	Date Year	23.08.15 1980
Evaluation Result	Element Type	Material	Type of Defects	AT No. Repair	BT Minor Repair	CT Major Repair	DT Emergency	Page No.	Remarks
Component		Steel	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination 16. Other Types of Defects					Detailed investi- gation	
	Abutment	Concrete	9. Fracture 10. Water Leakage / Puddle 12. Abnormal Spacing 13. Loose or Missing Bolts 14. Fracture 15. Function Disorder of Bearings 16. Other Types of Defects						
	Pier	Concrete	17. Defects of Reinforcing material 18. Abnormal Anchorage 19. Discoloration / Deterioration 20. Water Leakage / Puddle 21. Abnormal Noise / Vibration 22. Abnormal Deflection 23. Deformation / Break						
	Side Wall	Others	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination 16. Other Types of Defects						
	Parapet Wall	Common	17. Defects of Reinforcing material 19. Discoloration / Deterioration 20. Water Leakage / Puddle 21. Abnormal Noise / Vibration 23. Deformation / Break						
	* Primary element	Steel	1. Corrosion 2. Crack in Steel 5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 16. Other Types of Defects						
Substructure	Foundation	Concrete	7. Spalling / Exposed Rebar 16. Other Types of Defects						
	Footing	Others	25. Settlement / Tilt / Movement 26. Scouring						
	* Primary element	Common	6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination 16. Other Types of Defects 17. Defects of Reinforcing material 19. Discoloration / Deterioration 23. Deformation / Break						
	Retaining Wall	Others	16. Other Types of Defects 17. Defects of Reinforcing material 19. Discoloration / Deterioration 23. Deformation / Break						
	- Secondary element	Common	25. Settlement / Tilt / Movement 26. Scour						
	Bearing Main Body	Steel (Rubber)	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 12. Abnormal Spacing 15. Function Disorder of Bearings 16. Other Types of Defects						
	Anchor Bolts	Others	15. Function Disorder of Bearings 16. Other Types of Defects 20. Water Leakage / Puddle 21. Abnormal Noise / Vibration 23. Deformation / Break 24. Accumulation of Debris 25. Settlement / Tilt / Movement						
	* Primary element	Common	6. Crack 7. Spalling / Exposed Rebar 11. Delamination 16. Other Types of Defects 20. Water Leakage / Puddle 23. Deformation / Break						
	Bearing Seat Mortar	Concrete	7. Spalling / Exposed Rebar 11. Delamination						
	Bearing Bed concrete	Others	16. Other Types of Defects 20. Water Leakage / Puddle 23. Deformation / Break						
	* Primary element	Common	6. Crack 7. Spalling / Exposed Rebar 11. Delamination 16. Other Types of Defects 20. Water Leakage / Puddle 23. Deformation / Break						

Bridge Evaluation Report Form

File Number Zone	Rajshahi	Bridge Name Circle	Naiori Bridge Pabna	Superstructure Division	Sub-Structure Division	Sirajganj Sub-Division	Sub-Deck Sub-Division	Date Year	23.08.15 1980
Evaluation Result	Element Type	Material	Type of Defects	AT No. Repair	BT Minor Repair	CT Major Repair	DT Emergency	Page No.	Remarks
Component		Steel	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination 12. Abnormal Spacing 16. Other Types of Defects					Detailed investi- gation	
	Main Girder	Concrete	9. Fracture 10. Water Leakage / Puddle 12. Abnormal Spacing 13. Loose or Missing Bolts 14. Fracture 15. Function Disorder of Bearings 16. Other Types of Defects						
	Main Truss	Others	17. Defects of Reinforcing material 18. Abnormal Anchorage 19. Discoloration / Deterioration 20. Water Leakage / Puddle 21. Abnormal Noise / Vibration 22. Abnormal Deflection 23. Deformation / Break						
	Main Arch	Common	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination 16. Other Types of Defects						
	Outer Cable	Others	17. Defects of Reinforcing material 18. Abnormal Anchorage 19. Discoloration / Deterioration 20. Water Leakage / Puddle 21. Abnormal Noise / Vibration 22. Abnormal Deflection 23. Deformation / Break						
	Main Tower	Steel	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination 16. Other Types of Defects						
	Arch Rib	Concrete	9. Fracture 10. Water Leakage / Puddle 12. Abnormal Spacing 13. Loose or Missing Bolts 14. Fracture 15. Function Disorder of Bearings 16. Other Types of Defects						
	Top Slab	Common	17. Defects of Reinforcing material 18. Abnormal Anchorage 19. Discoloration / Deterioration 20. Water Leakage / Puddle 21. Abnormal Noise / Vibration 22. Abnormal Deflection 23. Deformation / Break						
	* Primary element	Steel	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination 16. Other Types of Defects						
Superstructure	Cross Beam	Concrete	9. Fracture 10. Water Leakage / Puddle 12. Abnormal Spacing 13. Loose or Missing Bolts 14. Fracture 15. Function Disorder of Bearings 16. Other Types of Defects						
	Stringer	Others	17. Defects of Reinforcing material 18. Abnormal Anchorage 19. Discoloration / Deterioration 20. Water Leakage / Puddle 21. Abnormal Noise / Vibration 22. Abnormal Deflection 23. Deformation / Break						
	* Primary element	Common	6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination 16. Other Types of Defects 17. Defects of Reinforcing material 18. Abnormal Anchorage 19. Discoloration / Deterioration 21. Abnormal Noise / Vibration 22. Abnormal Deflection 23. Deformation / Break						
	Lateral Bracing	Steel	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 16. Other Types of Defects						
	- Secondary element	Others	17. Defects of Reinforcing material 19. Discoloration / Deterioration 21. Abnormal Noise / Vibration 23. Deformation / Break						
	Deck Slab	Steel	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 9. Fallen out of Deck Slab 10. Crack of Deck Slab 11. Delamination 16. Other Types of Defects						
	* Primary element	Concrete	9. Fracture 10. Water Leakage / Puddle 12. Abnormal Spacing 13. Loose or Missing Bolts 14. Fracture 15. Function Disorder of Bearings 16. Other Types of Defects 17. Defects of Reinforcing material 18. Abnormal Anchorage 19. Discoloration / Deterioration 20. Water Leakage / Puddle 23. Deformation / Break						
	* Primary element	Others	17. Defects of Reinforcing material 18. Abnormal Anchorage 19. Discoloration / Deterioration 20. Water Leakage / Puddle 23. Deformation / Break						
	* Primary element	Common	6. Crack 7. Spalling / Exposed Rebar 11. Delamination 16. Other Types of Defects 20. Water Leakage / Puddle 23. Deformation / Break						

Bridge Evaluation Report Form

File Number	Zone	Rajshahi	Bridge Name	Circle	Pabna	Naorl Bridge	Superstructure	Division	Span No.	Sub-Division	Year	Date	Page No.	Remarks
							PSB with Steel Deck		1		1980	23.08.15	3/3	
Evaluators: KONISHI, Toshiyuki														
Evaluation Result		Material	Type of Defects	AI No.	BT Minor Repair	CT Major Repair	DI Emergency	DL	Public Safety	Detailed Investigation				
Element Type														
Pavement		Others	13. Difference in Level 14. Abnormal Bituminous Pavement											
- Secondary element		Common	15. Other Types of Defects 24. Accumulation of Debris											
Bridge Approaches		Others	13. Difference in Level 14. Abnormal Bituminous Pavement											
- Secondary element		Common	16. Other Types of Defects 24. Accumulation of Debris											
Expansion Joints (Rubber/Steel)		Concrete	6. Crack 11. Delamination											
> Including		Steel (Rubber)	2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture											
- elements of post-cast concrete		Others	12. Abnormal Spacing 13. Difference in Level			✓								
- Secondary element		Common	16. Other Types of Defects 21. Abnormal Noise / Vibration 23. Deformation / Break		✓									
Railing (Steel/Concrete)		Steel	2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture											
> Including		Concrete	5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence											
- Median		Others	11. Delamination											
- Curb		Common	16. Other Types of Defects 19. Discoloration / Deterioration 23. Deformation / Break											
- Secondary element		Steel	1. Corrosion 4. Fracture											
Drainage System		Polyvinyl	5. Deterioration of Paint System											
> Including		Others	16. Other Types of Defects 19. Discoloration / Deterioration 20. Water Leakage / Puddle 23. Deformation / Break											
- Catch-Basin		Common	24. Accumulation of Debris											
- Drainage Pipe		Steel	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture											
- Secondary element		Others	5. Deterioration of Paint System 16. Other Types of Defects 19. Discoloration / Deterioration 23. Deformation / Break											
Lighting Facility		Steel	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture											
Road Sign Facility		Others	5. Deterioration of Paint System 16. Other Types of Defects 19. Discoloration / Deterioration 23. Deformation / Break											
- Secondary element		Common	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture											
Inspection Facility		Steel	5. Deterioration of Paint System 16. Other Types of Defects 21. Abnormal Noise / Vibration 23. Deformation / Break											
Utility Pipe		Others	16. Other Types of Defects											
- Secondary element		Common	21. Abnormal Noise / Vibration 23. Deformation / Break											

Periodic Inspection/Evaluation Report Form (Sample)

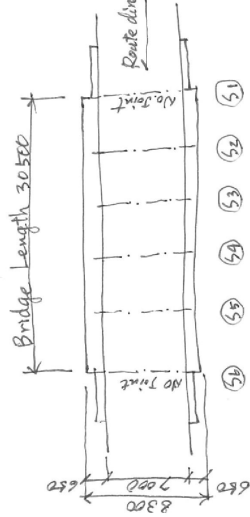
File Number	N6-LRP098-00011130		Inspector	Manikganj		Date		
Zone	Dhaka	Circle	Dhaka	Division	Manikganj	Sub-Division	Nayrhat	
District	-	Upazilla	-	Union	-	Village	-	
Road No.	N6	Road Name	Dhaka(Mirpur)-Utholi:Paturia		LRP Name	LRP098	Lat Long	23.91889 90.12111
Bridge Name	Sreerampur Box Culvert		LRP-Offset (m)	0.679	Chainage (km)	36.679		
Year of Construction	1998	Design Standard	-	Design Load	-	Load Restriction	- (ton)	
Feature Intersected	River	Owner	Owner	Public Utilities Carried	telephone line	water	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
Superstructure	Box Culvert	Material	Concrete	Type	RC	Material	Concrete	
Substructure	Abutment	Material	Concrete	Deck Slab	Piled	Material	Concrete	
	Pier	Material	Concrete	Foundation (Abutment)	Piled	Material	Concrete	
Other Elements	Pavement	Material	Asphalt	Bearings	None	Material	Concrete	
	Expansion Joint	Material	None	Railing	Steel	Material	Steel	
Total Width	8.30	Wheel Guard-L	7.00	Carriage way-L	7.00	Median	0.0	
Effective Width	7.00	Wheel Guard-R	7.00	Carriage way-R	7.00	Sidewalk-R	0.0	
Traffic Conditions	Genus (year)	Heavy Vehicle Traffic		Condition Category	0~10~10~20~30~30~30~			
	Traffic Volume	Vehicles (Daytime 12 hours)		Condition Category for Entire Bridge				

General Drawings

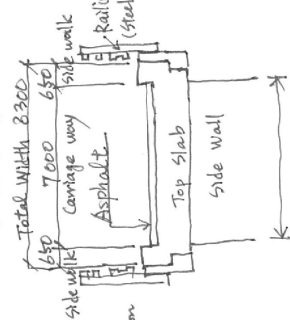
General View



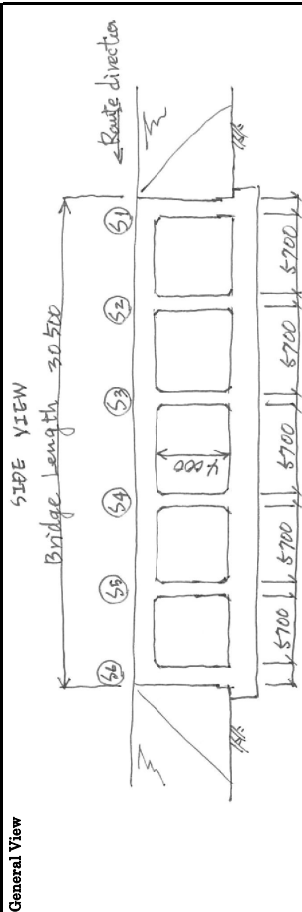
Plan



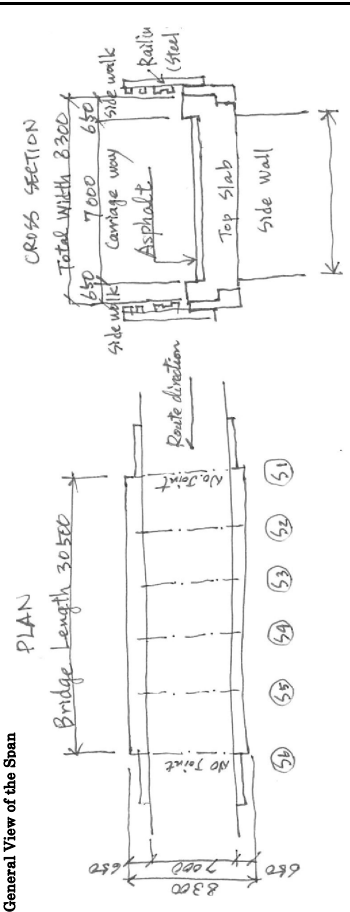
Cross Section



General View









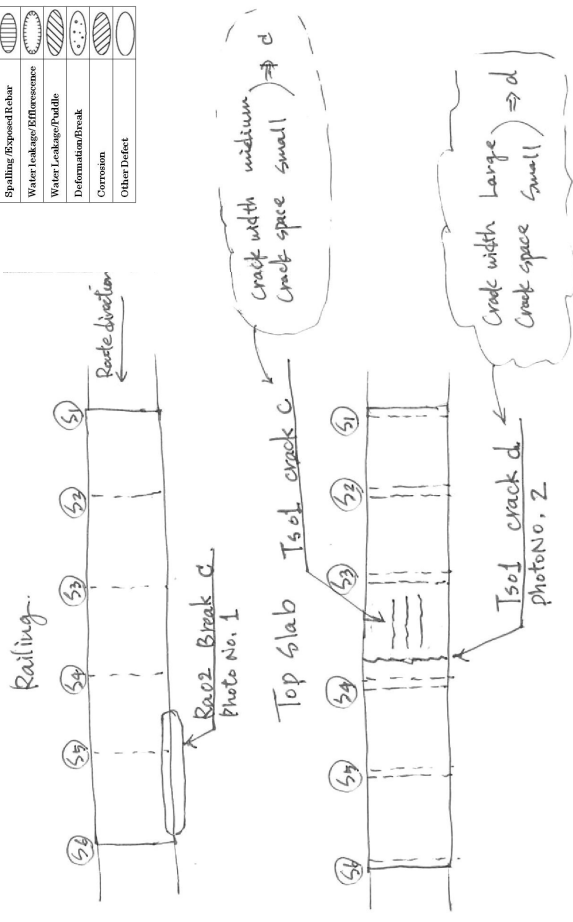
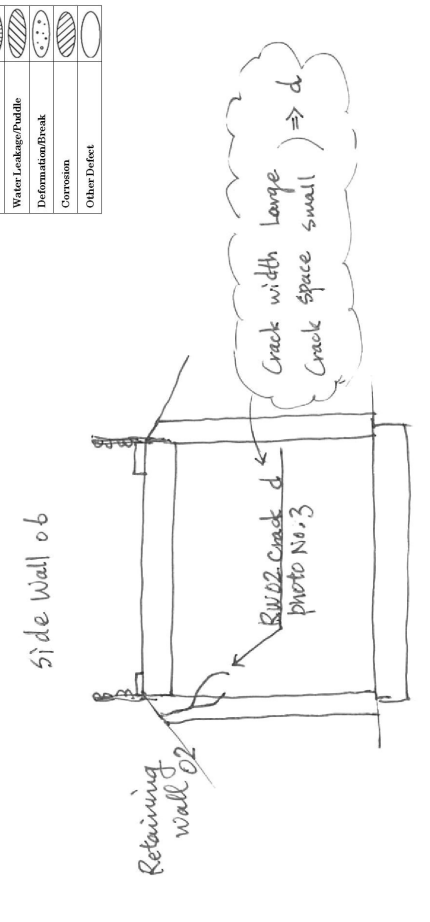
General View of the Span



Element Numbering System		Bridge Name	Sreerampur BoxCulvert	Route Name	Span No.
Bridge Number					
<p>The diagrams illustrate the components of a box culvert. The 'Top slab' is shown as a rectangular structure divided into three sections, labeled TS 01, with stationing markers S4, S5, S4, S3, S2, S1. A 'Route direction' arrow points to the left. The 'Side wall (sw), Footing (F)' and 'Retaining wall (Rw)' are shown as vertical structures with sloped sides, labeled with SW 01 through SW 06 and F 01. The 'Pavement (Pm) Railings (Ra)' are shown as a horizontal structure with a top layer (Ra 01), a middle layer (Pm 01), and a bottom layer (Ra 02).</p>					

Overall View Photo	Bridge Name	Sreerampur BoxCulvert	Route Name
	Date	19/07/17	
	Date	19/07/17	
	Date	19/07/17	

Defects Photos			Sreerampur Box Culvert			Bridge Name			Route Name						
Bridge Number	Span No.	Element	Photo No.	Defect	Rating	Span No.	Element	Photo No.	Defect	Rating	Span No.	Element	Photo No.	Defect	Rating
6	3	Railing				1	Break				1	Break			
															
						2	Crack				3	Top Slab			
															
						3	Crack				6	Retaining Wall			
															

Defect Sketch			Sreerampur Box Culvert			Bridge Name			Route Name						
Bridge Number	Span No.	Element	Photo No.	Defect	Rating	Span No.	Element	Photo No.	Defect	Rating	Span No.	Element	Photo No.	Defect	Rating
															

Bridge Evaluation Report Form

File Number Zone	Bridge Name	Circle	Nagamachi Bridge	Superstructure	Division	Box Culvert			Date	
						Span No.	Sub-Division	Year	1938	
Evaluation Result	Material	Type of Defects	Span No.	Sub-Division	Year	1938	Remarks			
Element Type	Material	Type of Defects	Span No.	Sub-Division	Year	1938	Remarks			
Pavement	Others	13. Difference in Level 14. Abnormal Bituminous Pavement 16. Other Types of Defects								
- Secondary element	Common	24. Accumulation of Debris								
Bridge Approaches	Others	13. Difference in Level 14. Abnormal Bituminous Pavement 16. Other Types of Defects								
- Secondary element	Common	24. Accumulation of Debris								
Expansion Joints (Rubber / Steel)	Concrete	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 6. Crack 11. Delamination 12. Abnormal Spacing 13. Difference in Level 16. Other Types of Defects 20. Water Leakage / Puddle 21. Abnormal Noise / Vibration 23. Deformation / Break 24. Accumulation of Debris								
> including - elements of post-cast concrete	Steel (Rubber)									
- Secondary element	Common									
Railing (Steel / Concrete) Wheel Guard (Concrete)	Steel	1. Corrosion 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination 16. Other Types of Defects 19. Discoloration / Deterioration 23. Deformation / Break								
> including - Guard Fence - Median - Curb	Concrete									
- Secondary element	Common									
Drainage System	Steel Polyvinyl	1. Corrosion 4. Fracture 5. Deterioration of Paint System 16. Other Types of Defects 19. Discoloration / Deterioration 20. Water Leakage / Puddle 23. Deformation / Break 24. Accumulation of Debris								
> including - Catch-Basin - Drainage Pipe	Others									
- Secondary element	Common									
Lighting Facility Road Sign Facility	Steel	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 16. Other Types of Defects 19. Discoloration / Deterioration 23. Deformation / Break								
- Secondary element	Common									
Inspection Facility Utility Pipe	Steel	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 16. Other Types of Defects 21. Abnormal Noise / Vibration 23. Deformation / Break								
- Secondary element	Common									

Bridge Evaluation Report Form

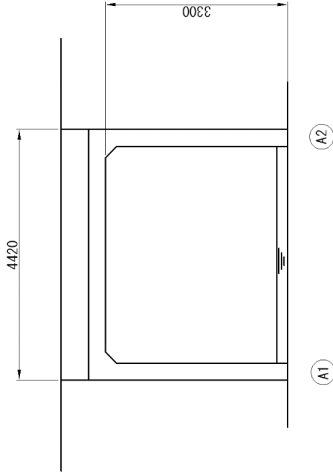
File Number Zone	Bridge Name	Circle	Nagamachi Bridge	Superstructure	Division	Box Culvert			Date	
						Span No.	Sub-Division	Year	1938	
Evaluation Result	Material	Type of Defects	Span No.	Sub-Division	Year	1938	Remarks			
Component	Material	Type of Defects	Span No.	Sub-Division	Year	1938	Remarks			
Abutment	Steel	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination 16. Other Types of Defects 17. Defects of Reinforcing material 19. Discoloration / Deterioration 20. Water Leakage / Puddle 21. Abnormal Noise / Vibration 23. Deformation / Break								
Pier	Concrete									
Side Wall	Others									
Parapet Wall	Common									
* Primary element	Steel	1. Corrosion 2. Crack in Steel 5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 16. Other Types of Defects								
Foundation	Concrete									
Footing	Others									
* Primary element	Common	25. Settlement / Tilt / Movement 26. Scouring								
Retaining Wall	Concrete	6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination 16. Other Types of Defects 17. Defects of Reinforcing material 19. Discoloration / Deterioration 23. Deformation / Break 25. Settlement / Tilt / Movement 26. Scour								
- Secondary element	Others									
Bearing Main Body	Steel (Rubber)	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture 5. Deterioration of Paint System 12. Abnormal Spacing 15. Function Disorder of Bearings 16. Other Types of Defects 20. Water Leakage / Puddle 21. Abnormal Noise / Vibration 23. Deformation / Break 24. Accumulation of Debris 25. Settlement / Tilt / Movement								
Anchor Bolts	Others									
* Primary element	Common									
Bearing Seat Mortar	Concrete	6. Crack 7. Spalling / Exposed Rebar 11. Delamination 16. Other Types of Defects 20. Water Leakage / Puddle 23. Deformation / Break								
Bearing Bed concrete	Others									
* Primary element	Common									

Periodic Inspection/Evaluation Report Form (Sample)

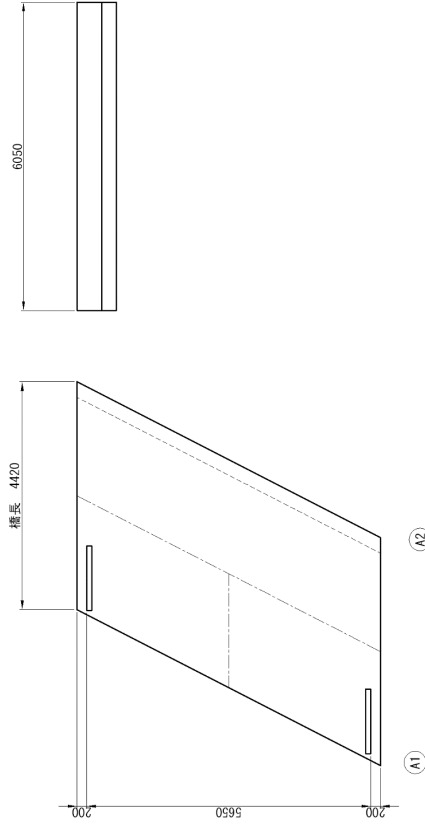
File Number	N1, 8b		Inspector	Date	
Zone	Dhaka	Circle	Dhaka	Division	Narayangj-1
District	Upazilla	Union		Village	
Road No.	N1	Road Name	Dhaka(Jatrabari)-Comilla-Chittagong-Taknaf	LRP Name	8b
		LRP-Offset (m)	5+3976	Lat	23°-42'-7.5"
		Design Standard	TL-20	Long	90°-30'-57.3"
		Design Load	Load Restriction	Chainage (km)	8.976
Year of Construction	1988	Owner	Public Utilities Carried	Telephone line	Owner
Feature Intersected	River	Owner	Public Utilities Carried	water	Owner
	Road	Owner			
	Railway	Owner			
Bridge Length	4.420	No. of Spans	1	Span Arrangement	4.420
				Skew Angle (degree)	63
Superstructure	Type		Material	Type	Material
	Box Culvert		Concrete	Deck Slab	RC
Abutment	...			Foundation (Abutment)	...
Pier	...			Foundation (Pier)	...
Pavement	Asphalt			Bearings	None
Expansion Joint	None			Railing	Steel
Total Width	6.05	m	Wheel Guard-L	Carriage way-L	Median
Effective Width	6.05	m	0.2	0.0	0.0
			0.2	0.0	0.0
Traffic Conditions	Census (year)		Heavy Vehicle Traffic Condition Category for Entire Bridge		
	Traffic Volume		0~10~10~20~30~30~30~		
			Vehicles (Daytime 12 hours)		
			35		
			B		

General Drawings	
Bridge Number	Nagamachi Bridge
Bridge Name	Nagamachi Bridge
Route Name	

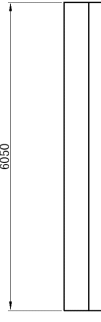
General View



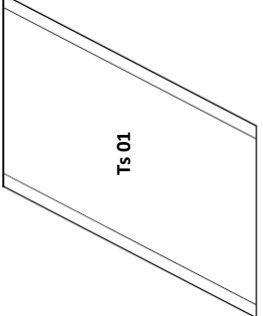
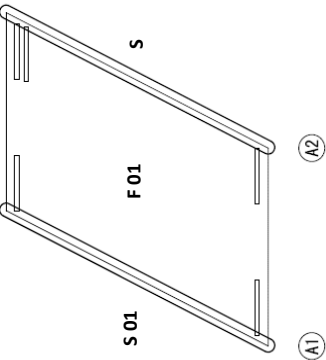
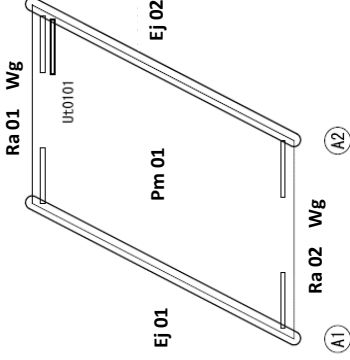
Plan






Cross Section

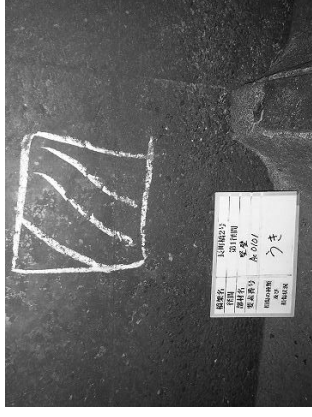


General View	Side View	Cross Section
General View of the Span	Plan	Cross Section

Element Numbering System		Bridge Name	Nagamachi Bridge	Route Name	Span No.
Bridge Number					1
<p>Top Slab (Ts)</p> 		<p>Side Wall (S), Footing (F)</p> 			
<p>Railing (Ra), Wheel Guard(Wg) Expansion Joint (Ej), Pavement (Pm)</p> 					

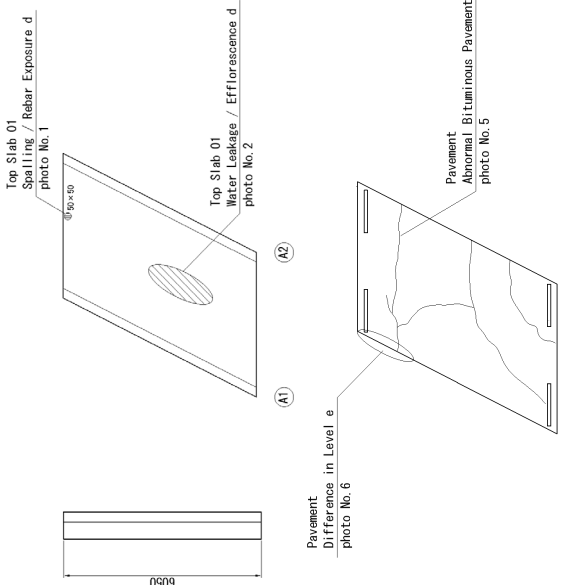
Overall View Photo	Bridge Number	Bridge Name	Nagamachi Bridge	Route Name	Viewpoint	
					Side View	Front View
					Viewpoint	Side View
					Date	
					Viewpoint	Front View
					Date	
					Viewpoint	Under Bridge
					Date	

Defect Photos				Nagamachi Bridge				Route Name									
Bridge Number		Span No.		Element		Photo No.		Span No.		Element		Photo No.		Defect		Rating	
1		1		Top Slab		1		1		Top Slab		1		Water Leakage / Puddle		2	
1		1		Side Wall		3		1		Side Wall		1		Defect		Rating	
1		1		Delamination		e		5		Abnormal Bituminous		e		6		Difference in Level	
1		1		Pavement		1		1		Pavement		1		Defect		Rating	

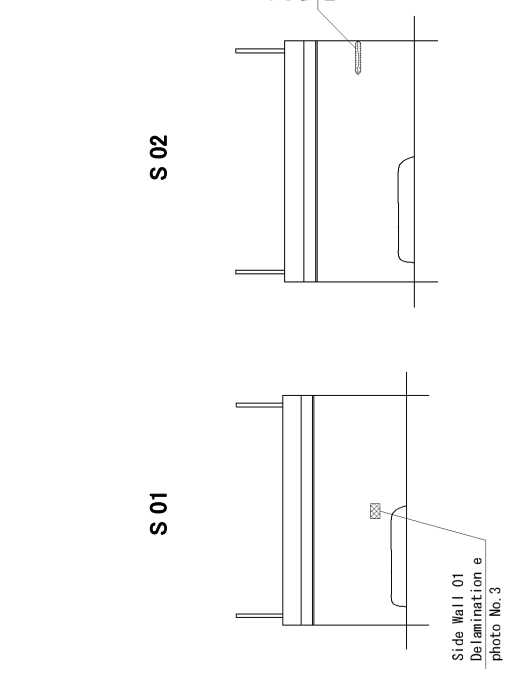


Defect Sketch				Nagamachi Bridge				Route Name									
Bridge Number		Span No.		Element		Photo No.		Span No.		Element		Photo No.		Defect		Rating	
1		1		Top Slab, Pavement		1		1		Top Slab		1		Water Leakage / Rebar Exposure		d	
1		1		Side Wall		1		1		Side Wall		1		Delamination		e	
1		1		Pavement		1		1		Pavement		1		Difference in Level		e	

Top Slab, Pavement



Side Wall



Periodic Inspection Report Form

File Number Zone	Inspector			Bridge Name		Ngamachi Bridge		Superstructure		Box Culvert		Date			
															Year
Survey Result	Zone	Circle	No. of Hinge	Division		Span Length	Sub-Division		Date						
				0	4.42m		Span No.	1	1938						
Items of Defects													Remarks		
Steel Material			Concrete Material			Others			Common						
Corrosion			Crack			Loose or Missing Bolts			Fracture			Deterioration of Paint System			
Crack			Fallen out of Deck Slab			Water Leakage/Efflorescence			Spalling/Exposed Rebar			Water Leakage/Rebar			
Crack			Fallen out of Deck Slab			Crack of Deck Slab			Delamination			Abnormal Spacing			
Crack			Difference in Level			Abnormal Bituminous Pavement			Functional disorder of Bearings			Others			
Crack			Defects of Reinforced Materials			Abnormal Anchorage			Discoloration/deterioration			Water Leakage/Puddle			
Crack			Abnormal Noise/Vibration			Abnormal Deflection			Deformation/Break			Accumulation of Debris			
Crack			Settlement/Tilt/Movement			Scour			Settlement/Tilt/Movement			Scour			
01	Top Slab														
01	Side Wall														
01	Footing														
01	Retaining Wall														
01	Railing (Steel)														
01	Wheel Guard														
01	Drainage System														
01	Pavement														
01	Bridge Approaches														
01	Lighting Facility														
01	Road Sign														
01	Utility Pipe														
Summary															
Recommendation															

Bridge Evaluation Report Form

File Number Zone	Inspector			Bridge Name		Ngamachi Bridge		Superstructure		Date				
													Year	1938
Evaluation Result	Zone	Circle	Division		Span Length	Sub-Division		Date						
			0	4.42m		Span No.	1	1938						
Items of Defects														
Steel Material			Concrete Material			Others			Common					
Corrosion			Crack			Loose or Missing Bolts			Fracture			Deterioration of Paint System		
Crack			Fallen out of Deck Slab			Water Leakage/Efflorescence			Spalling/Exposed Rebar			Water Leakage/Rebar		
Crack			Fallen out of Deck Slab			Crack of Deck Slab			Delamination			Abnormal Spacing		
Crack			Difference in Level			Abnormal Bituminous Pavement			Functional disorder of Bearings			Others		
Crack			Defects of Reinforced Materials			Abnormal Anchorage			Discoloration/deterioration			Water Leakage/Puddle		
Crack			Abnormal Noise/Vibration			Abnormal Deflection			Deformation/Break			Accumulation of Debris		
Crack			Settlement/Tilt/Movement			Scour			Settlement/Tilt/Movement			Scour		
	Component	Material	Element Type	Type of Defects	AT No.	Minor Repair	Major Repair	Emergency	Sub-Division	Span No.	Year	1938		
		Steel	Main Girder	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture	✓	✓			1		1938			
		Concrete	Main Truss Main Arch Outer Cable	5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination	✓	✓					1938			
		Others	Main Tower	12. Abnormal Spacing 16. Other Types of Defects	✓						1938			
		Common	Arch Rib Top Slab	17. Defects of Reinforcing material 18. Abnormal Anchorage 19. Discoloration / Deterioration 20. Water Leakage / Puddle 21. Abnormal Noise / Vibration 22. Abnormal Deflection 23. Deformation / Break	✓						1938			
		* Primary element												
		Steel	Cross Beam Stringer	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture										
		Concrete		5. Deterioration of Paint System 6. Crack 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 11. Delamination										
		Others		16. Other Types of Defects 17. Defects of Reinforcing material 18. Abnormal Anchorage										
		Common		19. Discoloration / Deterioration 21. Abnormal Noise / Vibration 22. Abnormal Deflection 23. Deformation / Break										
		* Primary element												
		Steel	Lateral Bracing	1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture										
		Others		5. Deterioration of Paint System 16. Other Types of Defects 17. Defects of Reinforcing material										
		Common		21. Abnormal Noise / Vibration 23. Deformation / Break										
		* Secondary element												
		Steel		1. Corrosion 2. Crack in Steel 3. Loose or Missing Bolts 4. Fracture										
		Concrete	Deck Slab	5. Deterioration of Paint System 7. Spalling / Exposed Rebar 8. Water leakage / Efflorescence 9. Fallen out of Deck Slab 10. Crack of Deck Slab 11. Delamination 16. Other Types of Defects 17. Defects of Reinforcing material 18. Abnormal Anchorage										
		Others		19. Discoloration / Deterioration 20. Water Leakage / Puddle 23. Deformation / Break										
		Common												
		* Primary element												

Bridge Evaluation Report Form

File Number Zone	Bridge Name Circle	Evaluator		Box Culvert	Date					
		Nagamachi Bridge	Superstructure		Year	1938				
Evaluation Result		Division		Span No.		Sub-Division	Page No.	Detailed Investi- gation	Remarks	
Element Type	Material	Type of Defects	AT No. Repair	BT Minor Repair	CT Major Repair					DT Emer- gency
Component	Abutment Pier Side Wall Parapet Wall * Primary element	1. Corrosion								
		2. Crack in Steel	Steel							
		3. Loose or Missing Bolts								
		4. Fracture								
		5. Deterioration of Paint System								
		6. Crack	Concrete	7. Spalling / Exposed Rebar	✓					
		8. Water leakage / Efflorescence		9. Delamination		✓				
		11. Delamination	Others	16. Other Types of Defects			✓			
		17. Defects of Reinforcing material		19. Discoloration / Deterioration						
		20. Water Leakage / Puddle	Common	21. Abnormal Noise / Vibration						
		23. Deformation / Break		23. Deformation / Break						
		1. Corrosion	Steel	2. Crack in Steel						
		5. Deterioration of Paint System		6. Crack						
Substructure	Foundation Footing * Primary element	7. Spalling / Exposed Rebar	Concrete							
		16. Other Types of Defects	Others	25. Settlement / Tilt / Movement						
		26. Scouring	Common	6. Crack						
		7. Spalling / Exposed Rebar	Concrete	8. Water leakage / Efflorescence						
		11. Delamination	Others	16. Other Types of Defects						
		17. Defects of Reinforcing material		19. Discoloration / Deterioration						
		23. Deformation / Break	Common	25. Settlement / Tilt / Movement						
		26. Scour		26. Scour						
		1. Corrosion	Steel (Rubber)	2. Crack in Steel						
		3. Loose or Missing Bolts		4. Fracture						
		5. Deterioration of Paint System	Others	15. Function Disorder of Bearings						
		16. Other Types of Defects		20. Water Leakage / Puddle						
		21. Abnormal Noise / Vibration	Common	23. Deformation / Break						
24. Accumulation of Debris		25. Settlement / Tilt / Movement								
6. Crack	Concrete	7. Spalling / Exposed Rebar								
11. Delamination	Others	16. Other Types of Defects								
20. Water Leakage / Puddle	Common	23. Deformation / Break								
23. Deformation / Break		23. Deformation / Break								
Bearings	Bearing Main Body Anchor Bolts * Primary element Bearing Seat Mortar Bearing Bed concrete * Primary element	1. Corrosion	Steel							
		2. Crack in Steel								
		3. Loose or Missing Bolts								
		4. Fracture								
		5. Deterioration of Paint System	Others	15. Function Disorder of Bearings						
		12. Abnormal Spacing		16. Other Types of Defects						
		19. Discoloration / Deterioration	Common	20. Water Leakage / Puddle						
		21. Abnormal Noise / Vibration		23. Deformation / Break						
		24. Accumulation of Debris		25. Settlement / Tilt / Movement						
		6. Crack	Concrete	7. Spalling / Exposed Rebar						
		11. Delamination	Others	16. Other Types of Defects						
		20. Water Leakage / Puddle	Common	23. Deformation / Break						
		23. Deformation / Break		23. Deformation / Break						

Bridge Evaluation Report Form

File Number Zone	Bridge Name Circle	Evaluator		Box Culvert	Date				
		Nagamachi Bridge	Superstructure		Year	1938			
Evaluation Result		Division		Span No.		Sub-Division	Page No.	Detailed Investi- gation	Remarks
Element Type	Material	Type of Defects	AT No. Repair	BT Minor Repair	CT Major Repair				
Pavement - Secondary element	Common	13. Difference in Level							
		14. Abnormal Bituminous Pavement	Others	16. Other Types of Defects					
		24. Accumulation of Debris		24. Accumulation of Debris					
		1. Corrosion	Common	2. Crack in Steel					
		3. Loose or Missing Bolts	Steel (Rubber)	4. Fracture					
		5. Deterioration of Paint System		6. Crack					
		11. Delamination	Concrete	12. Abnormal Spacing					
		13. Difference in Level	Others	16. Other Types of Defects					
		20. Water Leakage / Puddle	Common	21. Abnormal Noise / Vibration					
		23. Deformation / Break		24. Accumulation of Debris					
		1. Corrosion	Steel	2. Crack in Steel					
		3. Loose or Missing Bolts		4. Fracture					
		5. Deterioration of Paint System		6. Crack					
Railing (Steel / Concrete) Wheel Guard (Concrete) > Including - Guard Fence - Median - Curb - Secondary element	Common	7. Spalling / Exposed Rebar	Concrete						
		8. Water leakage / Efflorescence		11. Delamination					
		16. Other Types of Defects	Others	19. Discoloration / Deterioration					
		23. Deformation / Break	Common	23. Deformation / Break					
		1. Corrosion	Steel	2. Crack in Steel					
		4. Fracture	Polyvinyl	5. Deterioration of Paint System					
		16. Other Types of Defects	Others	19. Discoloration / Deterioration					
		20. Water Leakage / Puddle	Common	23. Deformation / Break					
		24. Accumulation of Debris		24. Accumulation of Debris					
		1. Corrosion	Steel	2. Crack in Steel					
		3. Loose or Missing Bolts		4. Fracture					
		5. Deterioration of Paint System	Others	16. Other Types of Defects					
		19. Discoloration / Deterioration	Common	20. Water Leakage / Puddle					
23. Deformation / Break		23. Deformation / Break							
Lighting Facility Road Sign Facility - Secondary element	Common	1. Corrosion	Steel						
		2. Crack in Steel							
		3. Loose or Missing Bolts							
		4. Fracture							
		5. Deterioration of Paint System	Others	16. Other Types of Defects					
		19. Discoloration / Deterioration	Common	23. Deformation / Break					
		23. Deformation / Break		23. Deformation / Break					
		1. Corrosion	Steel	2. Crack in Steel					
		3. Loose or Missing Bolts		4. Fracture					
		5. Deterioration of Paint System	Others	16. Other Types of Defects					
		19. Discoloration / Deterioration	Common	21. Abnormal Noise / Vibration					
		23. Deformation / Break		23. Deformation / Break					
		Inspection Facility Utility Pipe - Secondary element	Common	1. Corrosion	Steel				
2. Crack in Steel									
3. Loose or Missing Bolts									
4. Fracture									
5. Deterioration of Paint System	Others			16. Other Types of Defects					
19. Discoloration / Deterioration	Common			21. Abnormal Noise / Vibration					
23. Deformation / Break				23. Deformation / Break					
1. Corrosion	Steel			2. Crack in Steel					
3. Loose or Missing Bolts				4. Fracture					
5. Deterioration of Paint System	Others			16. Other Types of Defects					
19. Discoloration / Deterioration	Common			21. Abnormal Noise / Vibration					
23. Deformation / Break				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	T _≥ 20mm or not
	13)	Difference in Level	a	-	c	-	e	
	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	

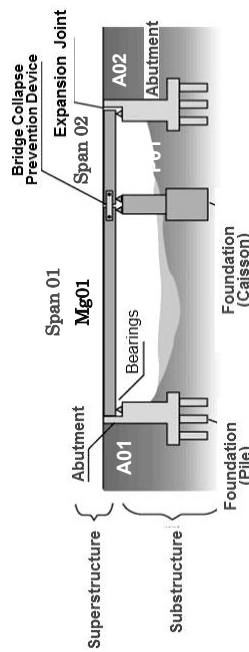
Bridge Element Numbering System

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

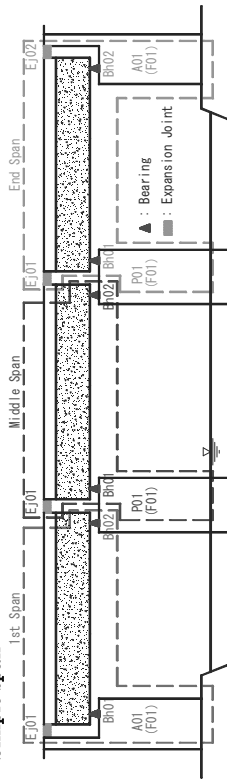
The superstructure element numbering system should include the spans, the girders, and in case of truss the panel point

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.

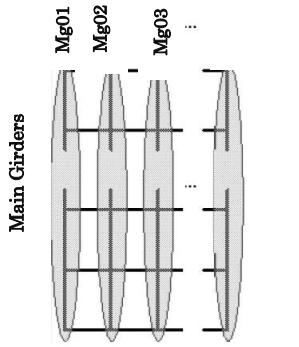
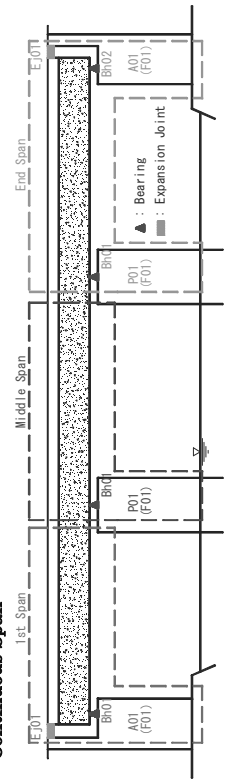


Each element of main girders and deck slab, abutment and piers, and bearings is numbered according to the following span configuration..

a. Simple span



b. Continuous Span



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

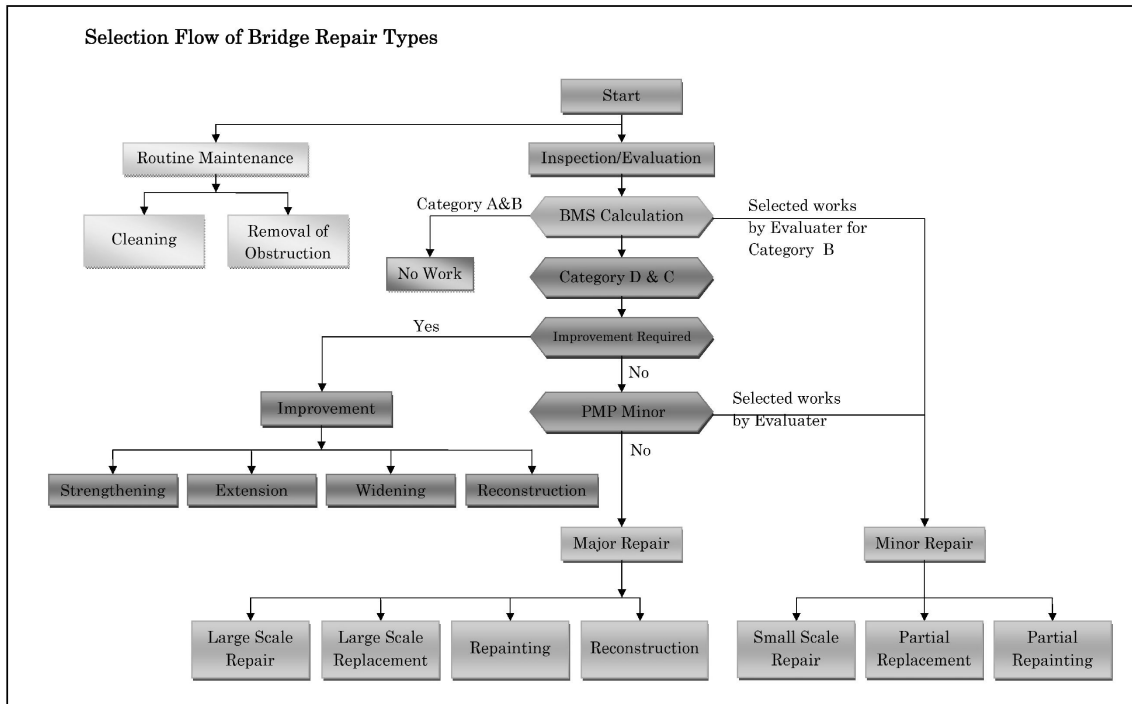


Figure 1-4 Selection Flow of Bridge repair types

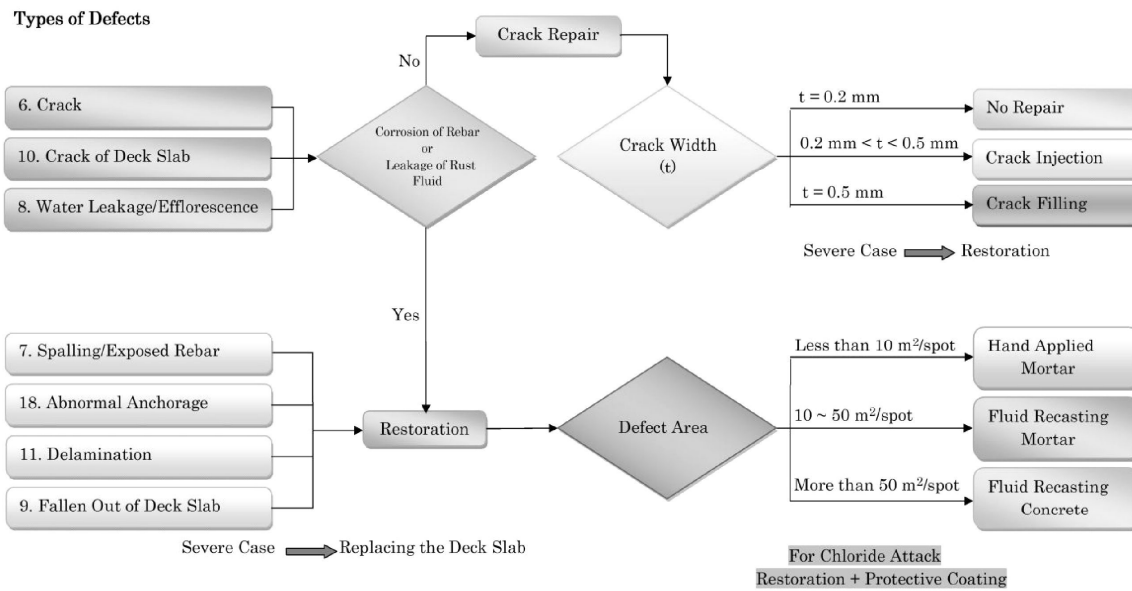


Figure 4-1 Selection Flow of Repair method of Concrete elements (Superstructure)

The Flow based by Local Government Jp

Types of Defects

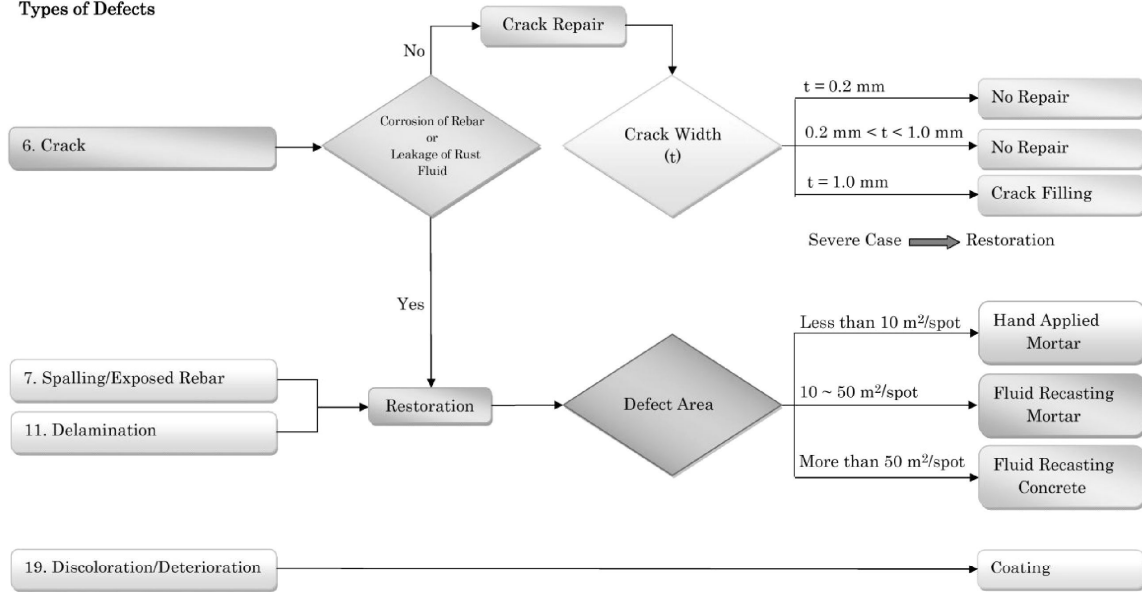


Figure 4-2 Selection Flow of Repair method of Concrete elements (Substructure)
The Flow based by Local Government Jp

Selection Flow of Repair Method of Steel Elements

Types of Defects

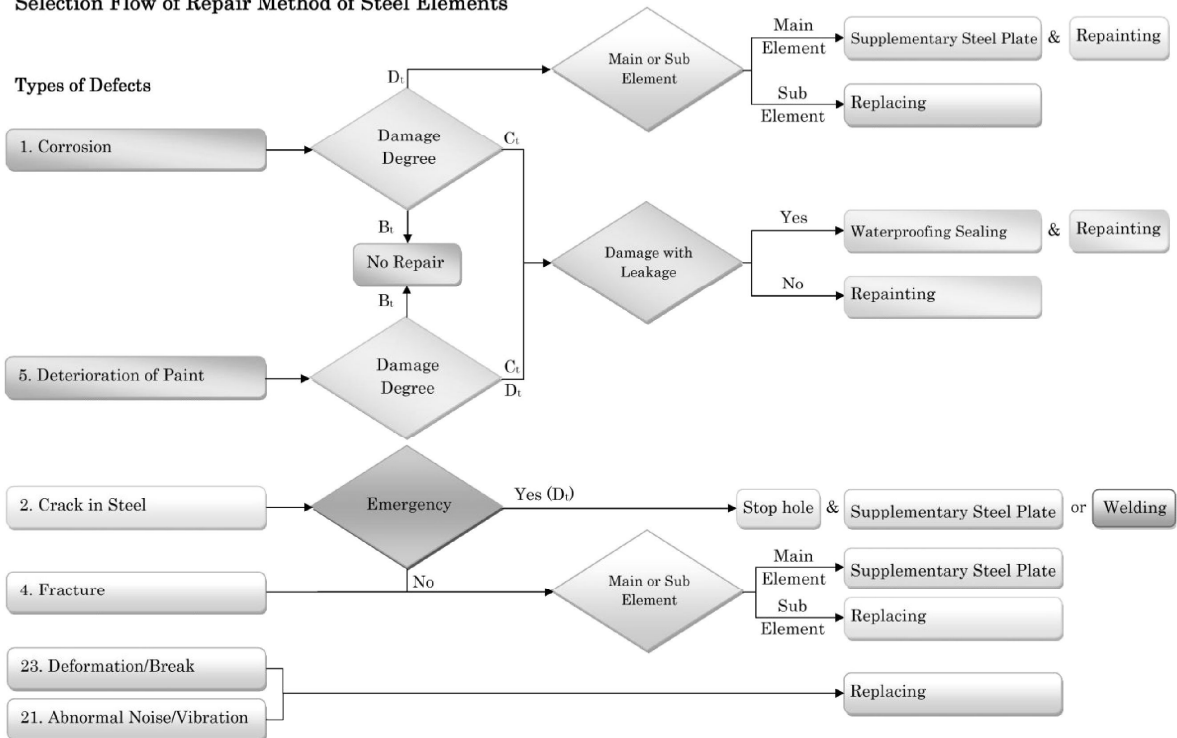


Figure 4-3 Selection Flow of Repair method of steel elements

The Flow based by Local Government Jp

Selection Flow of Repair Method of Expansion Joint

Types of Defects

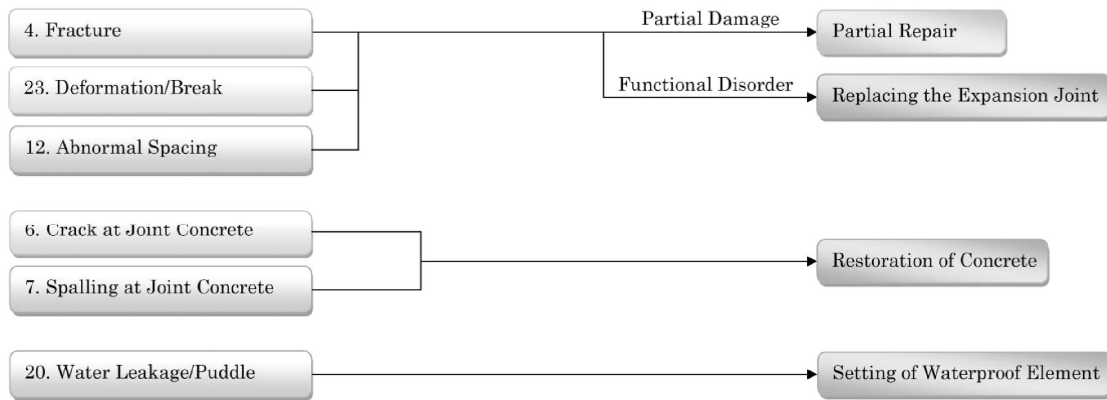


Figure 4-9 Selection Flow of Repair method of Expansion joint

The Flow based by Local Government Jp

Selection Flow of Repair Method of Bearing

Types of Defects

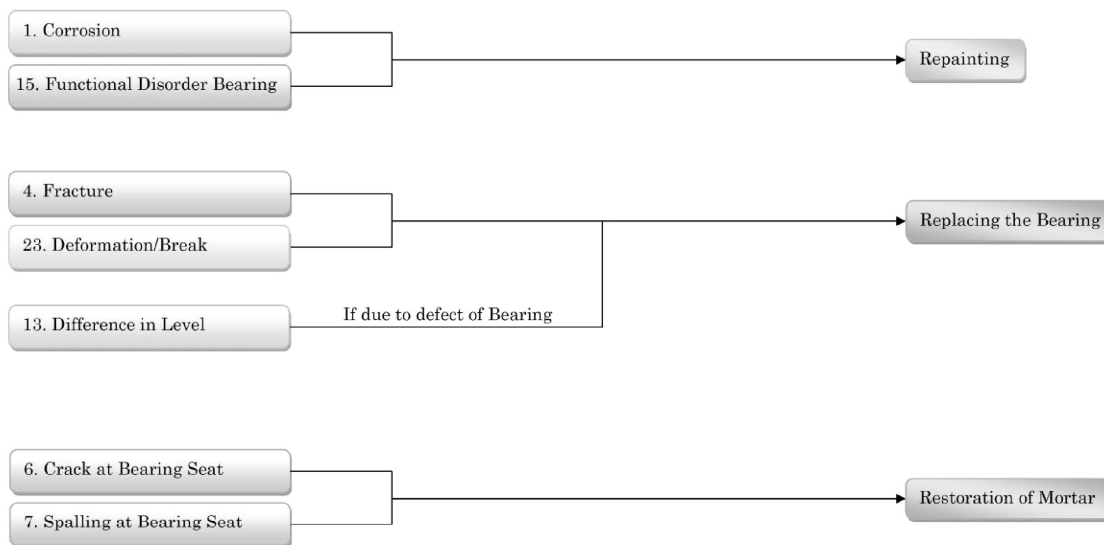


Figure 4-11 Selection Flow of Repair method of Bearing

The Flow based by Local Government Jp

Selection Flow of Repair Method of Footing

Types of Defects

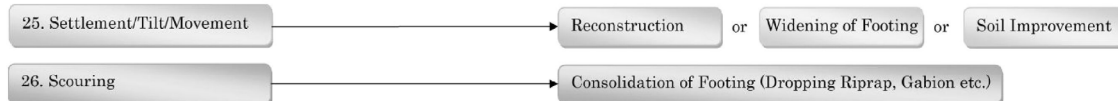


Figure 4-13 Selection Flow of Repair method of Footing

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
TABLES OF SETTINGS IN BMS

Bridge Type : Box Culvert		BMS Defects Coefficient Setting					
Element	Defect Type	Defect Coefficient	Quantity coefficient		No. of Rule		
			Ct	Dt	Ct	Dt	
Common	Bridge Approach	13	Difference in Level	0.00			
		14	Abnormal Pavement	0.00			
		16	Others	0.00			
		24	Debris	0.00			
Common	Curb	6	Crack	0.00			
		7	Spalling / Exposed	0.00			
		8	Water Leakage	0.00			
		11	Delamination	0.00			
		16	Others	0.00			
		23	Deformation	0.00			
Common	Drainage System	1	Corrosion	0.00			
		4	Fracture	0.00			
		5	Deterioration of Paint	0.00			
		16	Others	0.00			
		19	Discoloration of Materials	0.00			
		20	Water Leakage	0.00			
		23	Deformation	0.00			
		24	Debris	0.00			
Culvert	Footing	6	Crack	0.43	2.00	2.00	301
		7	Spalling / Exposed	0.57	0.50	-	301
		16	Others	0.00	5.00	5.00	101
		25	Settlement	0.25	5.00	5.00	101
		26	Scouring	1.00	5.00	5.00	101
		6	Crack	0.33	2.00	1.00	301
Box Culvert	Head Slab	7	Spalling / Exposed	0.67	0.05	-	301
		8	Water Leakage	0.17			
		11	Delamination	0.17			
		16	Others	0.00			
		17	Reinforcing Material	0.30			
		19	Discoloration of Materials	0.03			
		20	Water Leakage	0.14			
		21	Noise / Vibration	0.50			
		23	Deformation	0.03			
		1	Corrosion	0.00			
		2	Crack in Steel	0.00			
Common	Lighting facility	3	Loose Bolts	0.00			
		4	Fracture	0.00			
		5	Deterioration of Paint	0.00			
		16	Others	0.00			
Common	Pavement	13	Difference in Level	0.00	1.00	-	104
		14	Abnormal Pavement	0.00			
		16	Others	0.00			
		24	Debris	0.00			
		6	Crack	0.00			
		7	Spalling / Exposed	0.00			
Common	Railing (concrete)	8	Water Leakage	0.00			
		11	Delamination	0.00			
		16	Others	0.00			
		18	Abnormal Anchorage	0.00			
		23	Deformation	0.00			
		6	Crack	0.00			

Common	Railing (steel)	1	Corrosion	0.00			
		2	Crack in Steel	0.00			
		3	Loose Bolts	0.00			
		4	Fracture	0.00			
		5	Deterioration of Paint	0.00			
		16	Others	0.00			
Common	Retaining wall	6	Crack	0.00	5.00	5.00	101
		7	Spalling / Exposed	0.00	5.00	-	101
		8	Water Leakage	0.00			
		11	Delamination	0.00			
		17	Reinforcing Material	0.00			
		19	Discoloration of Materials	0.00			
Common	Road Sign	23	Deformation	0.00	5.00	5.00	101
		1	Corrosion	0.00			
		2	Crack in Steel	0.00			
		3	Loose Bolts	0.00			
		4	Fracture	0.00			
		5	Deterioration of Paint	0.00			
Culvert	Side Wall	6	Crack	0.43	2.00	2.00	303
		7	Spalling / Exposed	0.57	0.50	-	303
		8	Water Leakage	0.29			
		11	Delamination	0.14			
		16	Others	0.00			
		17	Reinforcing Material	0.57			
Common	Utility Pipes	1	Corrosion	0.00			
		2	Crack in Steel	0.00			
		3	Loose Bolts	0.00			
		4	Fracture	0.00			
		5	Deterioration of Paint	0.00			
		16	Others	0.00			
Common	Wheel Guard	6	Crack	0.00			
		7	Spalling / Exposed	0.00			
		8	Water Leakage	0.00			
		11	Delamination	0.00			
		16	Others	0.00			
		18	Abnormal Anchorage	0.00			

Bridge Type : Concrete Arch Bridge		BMS Defects Coefficient Setting								
Element	Defect Type	Defect Coefficient	Quantity coefficient		No. of Rule					
			Ct	Dt	Ct	Dt				
Common	Abutment	6 Crack	5.00	5.00	101	101				
		7 Spalling / Exposed	5.00	5.00	101	101				
		8 Water Leakage								
		11 Delamination								
		16 Others								
		17 Reinforcing Material								
		19 Discoloration of Materials								
		20 Water Leakage								
		23 Deformation								
		1 Corrosion	0.25	1.00	1.00	101	101			
		2 Crack in Steel	1.00	1.00	1.00	101	101			
		3 Loose Bolts	0.50							
		4 Fracture	1.00							
		5 Deterioration of Paint	0.25							
		15 Disorder of Bearing	1.00							
		16 Others	0.00							
		20 Water Leakage	0.25							
		23 Deformation	0.13							
		24 Debris	0.13							
		25 Settlement	0.88							
		Common	Bearing (rubber)	1 Corrosion	0.25	1.00	1.00	101		
				2 Crack in Steel	1.00	1.00	1.00	101		
				3 Loose Bolts	0.50					
4 Fracture	1.00									
5 Deterioration of Paint	0.25									
15 Disorder of Bearing	1.00									
16 Others	0.00									
20 Water Leakage	0.25									
23 Deformation	0.13									
24 Debris	0.13									
25 Settlement	0.88									
Common	Bearing (steel)			1 Corrosion	0.25	1.00	1.00	101		
				2 Crack in Steel	1.00	1.00	1.00	101		
				3 Loose Bolts	0.50					
				4 Fracture	1.00					
				5 Deterioration of Paint	0.25					
				15 Disorder of Bearing	0.75					
				16 Others	0.00					
				20 Water Leakage	0.25					
				23 Deformation	0.25					
				24 Debris	0.25					
				25 Settlement	0.50					
				Common	Bearing seat	6 Crack	0.14	0.25	0.25	101
		11 Delamination	0.29			0.25	0.25	101		
		16 Others	0.00							
		23 Deformation	1.00			0.25	0.25	101		
		13 Difference in Level	0.00							
		14 Abnormal Pavement	0.00							
		16 Others	0.00							
		24 Debris	0.00							
		Common	Bridge Approach			6 Crack	0.40	2.00	201	203
						7 Spalling / Exposed	0.80	0.01	201	201
						8 Water Leakage	0.40			
						11 Delamination	0.20			
16 Others	0.00									
17 Reinforcing Material	0.40									
18 Abnormal Anchorage	0.50									
19 Discoloration of Materials	0.05									
21 Noise / Vibration	1.00									
23 Deformation	0.05									
Common	Curb					6 Crack	0.00			
						7 Spalling / Exposed	0.00			
						8 Water Leakage	0.00			
						11 Delamination	0.00			
						16 Others	0.00			
				18 Abnormal Anchorage	0.00					
				23 Deformation	0.00					

Element	Defect Type	Defect Coefficient	Quantity coefficient		No. of Rule					
			Ct	Dt	Ct	Dt				
Common	Deck Slab (concrete)	7 Spalling / Exposed	0.10	0.05	202	202				
		8 Water Leakage	0.10							
		9 Fallen out of Deck	1.00	1.00	1.00	201				
		10 Crack of Deck	0.75	2.00	1.00	202				
		11 Delamination	0.03							
		16 Others	0.00							
		17 Reinforcing Material	0.25							
		18 Abnormal Anchorage	0.25							
		19 Discoloration of Materials	0.03							
		Common	Drainage System	1 Corrosion	0.00					
				4 Fracture	0.00					
				5 Deterioration of Paint	0.00					
				16 Others	0.00					
				19 Discoloration of Materials	0.00					
				20 Water Leakage	0.00					
				23 Deformation	0.00					
				24 Debris	0.00					
				Common	Exp. Joints (Rubber)	12 Abnormal Spacing	0.00	1.00	103	103
						13 Difference in Level	0.00	1.00	1.00	103
						16 Others	0.00			
						20 Water Leakage	0.00	1.00	1.00	103
						21 Noise / Vibration	0.00			
						23 Deformation	0.00	1.00	1.00	103
24 Debris	0.00									
Common	Exp. Joints (Steel)					1 Corrosion	0.00	1.00	103	103
						2 Crack in Steel	0.00			
						3 Loose Bolts	0.00			
						4 Fracture	0.00	1.00	1.00	103
						5 Deterioration of Paint	0.00			
						12 Abnormal Spacing	0.00			
						13 Difference in Level	0.00	1.00	1.00	103
						16 Others	0.00			
		20 Water Leakage	0.00							
		21 Noise / Vibration	0.00							
		23 Deformation	0.00			1.00	1.00	103		
		24 Debris	0.00							
		Common	Foundation			16 Others	0.00			
						25 Settlement	0.25	150	150	101
						26 Scouring	1.00	150	150	101
						Common	Inspection Facility	1 Corrosion	0.00	
				2 Crack in Steel	0.00					
				3 Loose Bolts	0.00					
				4 Fracture	0.00					
				5 Deterioration of Paint	0.00					
				16 Others	0.00					
				20 Water Leakage	0.00					
				21 Noise / Vibration	0.00					
23 Deformation	0.00									
Common	Lighting facility			1 Corrosion	0.00					
				2 Crack in Steel	0.00					
				3 Loose Bolts	0.00					
				4 Fracture	0.00					
				5 Deterioration of Paint	0.00					
				16 Others	0.00					
				19 Discoloration of Materials	0.00					
				23 Deformation	0.00					

Common	Road Sign	1	Corrosion	0.00				
		2	Crack in Steel	0.00				
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00				
		16	Others	0.00				
		19	Discoloration of Materials	0.00				
		23	Deformation	0.00				
		1	Corrosion	0.00				
		2	Crack in Steel	0.00				
3	Loose Bolts	0.00						
4	Fracture	0.00						
5	Deterioration of Paint	0.00						
16	Others	0.00						
19	Discoloration of Materials	0.00						
23	Deformation	0.00						
Common	Wheel Guard	6	Crack	0.00				
		7	Spalling / Exposed	0.00				
		8	Water Leakage	0.00				
		11	Delamination	0.00				
		16	Others	0.00				
		18	Abnormal Anchorage	0.00				
		23	Deformation	0.00				

Concrete Arch	Main Arch	6	Crack	0.33	0.50	1.00	205	205
		7	Spalling / Exposed	0.67	0.05	-	204	-
		8	Water Leakage	0.17				
		11	Delamination	0.17				
		12	Abnormal Spacing	0.17				
		16	Others	0.00				
		17	Reinforcing Material	0.30				
		18	Abnormal Anchorage	0.67	0.16	-	101	-
		19	Discoloration of Materials	0.03				
		21	Noise / Vibration	0.50				
22	Abnormal Deflection	0.30						
23	Deformation	0.03						

Arch	Parapet Wall	6	Crack	0.33				
		7	Spalling / Exposed	0.67				
		8	Water Leakage	0.17				
		11	Delamination	0.17				
		6	Crack	0.33				
		7	Spalling / Exposed	0.67				
		8	Water Leakage	0.17				
		11	Delamination	0.17				
		12	Abnormal Spacing	0.17				
		16	Others	0.00				
19	Discoloration of Materials	0.03						
21	Noise / Vibration	0.50						
22	Abnormal Deflection	0.30						
23	Deformation	0.03						

Common	Pavement	13	Difference in Level	0.00				
		14	Abnormal Pavement	0.00	1.00	-	104	-
		16	Others	0.00				
		24	Debris	0.00				

Common	Pier	6	Crack	0.43	10.00	10.00	101	101
		7	Spalling / Exposed	0.57	10.00	-	101	-
		8	Water Leakage	0.29				
		11	Delamination	0.14				
		16	Others	0.00				
		17	Reinforcing Material	0.57				
		19	Discoloration of Materials	0.14				
		20	Water Leakage	0.14				
		23	Deformation	0.14				

Common	Railing (concrete)	6	Crack	0.00				
		7	Spalling / Exposed	0.00				
		8	Water Leakage	0.00				
		11	Delamination	0.00				
		16	Others	0.00				
		18	Abnormal Anchorage	0.00				
		23	Deformation	0.00	-	1.00	-	102

Common	Railing (steel)	1	Corrosion	0.00				
		2	Crack in Steel	0.00				
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00				
		16	Others	0.00				
		23	Deformation	0.00	-	1.00	-	102

Common	Retaining wall	6	Crack	0.00	5.00	5.00	101	101
		7	Spalling / Exposed	0.00	5.00	-	101	-
		8	Water Leakage	0.00				
		11	Delamination	0.00				
		16	Others	0.00				
		17	Reinforcing Material	0.00				
		19	Discoloration of Materials	0.00				
		23	Deformation	0.00				
		25	Settlement	0.00	5.00	5.00	101	101
		26	Scouring	0.00	5.00	5.00	101	101

Bridge Type : Masonry Arch Bridge		BMS Defects Coefficient Setting						
Element	Defect Type	Quantity coefficient		No. of Rule				
		Ct	Dt	Ct	Dt			
Common	Abutment	6	Crack	0.43	101	101		
		7	Spalling / Exposed	0.57	101	-		
		8	Water Leakage	0.29				
		11	Delamination	0.14				
		16	Others	0.00				
		17	Reinforcing Material	0.57				
		19	Discoloration of Materials	0.14				
		20	Water Leakage	0.14				
		23	Deformation	0.14				
		Masonry Arch	Arch Rib	6	Crack	0.33		
				7	Spalling / Exposed	0.87		
				8	Water Leakage	0.17		
				11	Delamination	0.17		
				12	Abnormal Spacing	0.17		
				16	Others	0.00		
				17	Reinforcing Material	0.30		
				18	Abnormal Anchorage	0.00		
				19	Discoloration of Materials	0.03		
				21	Noise / Vibration	0.50		
				22	Abnormal Deflection	0.30		
		23	Deformation	0.03				
		Common	Bridge Approach	13	Difference in Level	0.00		
				14	Abnormal Pavement	0.00		
16	Others			0.00				
24	Debris			0.00				
Common	Curb	6	Crack	0.00				
		7	Spalling / Exposed	0.00				
		8	Water Leakage	0.00				
		11	Delamination	0.00				
		16	Others	0.00				
		18	Abnormal Anchorage	0.00				
Common	Drainage System	1	Corrosion	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00				
		16	Others	0.00				
		19	Discoloration of Materials	0.00				
		20	Water Leakage	0.00				
		23	Deformation	0.00				
		24	Debris	0.00				
		16	Others	0.00				
		25	Settlement	0.25				
Common	Foundation	26	Scouring	1.00	150	150		
		26	Scouring	1.00	150	150		
Common	Lighting facility	1	Corrosion	0.00				
		2	Crack in Steel	0.00				
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00				
		16	Others	0.00				
		19	Discoloration of Materials	0.00				
Common	Wheel Guard	6	Crack	0.33				
		7	Spalling / Exposed	0.87				
		8	Water Leakage	0.17				
		11	Delamination	0.17				
		16	Others	0.00				

Arch	Parapet Wall	6	Crack	0.33		
		7	Spalling / Exposed	0.87		
		8	Water Leakage	0.17		
		11	Delamination	0.17		
		12	Abnormal Spacing	0.17		
		16	Others	0.00		
		19	Discoloration of Materials	0.03		
		21	Noise / Vibration	0.50		
		22	Abnormal Deflection	0.30		
		23	Deformation	0.03		
Common	Pavement	13	Difference in Level	0.00		
		14	Abnormal Pavement	0.00		
		16	Others	0.00		
		24	Debris	0.00		
Common	Railing (concrete)	6	Crack	0.00		
		7	Spalling / Exposed	0.00		
		8	Water Leakage	0.00		
		11	Delamination	0.00		
		16	Others	0.00		
		18	Abnormal Anchorage	0.00		
		23	Deformation	0.00		
Common	Railing (steel)	1	Corrosion	0.00		
		2	Crack in Steel	0.00		
		3	Loose Bolts	0.00		
		4	Fracture	0.00		
		5	Deterioration of Paint	0.00		
		16	Others	0.00		
		23	Deformation	0.00		
Common	Retaining wall	6	Crack	0.00		
		7	Spalling / Exposed	0.00		
		8	Water Leakage	0.00		
		11	Delamination	0.00		
		16	Others	0.00		
		17	Reinforcing Material	0.00		
		19	Discoloration of Materials	0.00		
		23	Deformation	0.00		
		25	Settlement	0.00		
		26	Scouring	0.00		
Common	Road Sign	1	Corrosion	0.00		
		2	Crack in Steel	0.00		
		3	Loose Bolts	0.00		
		4	Fracture	0.00		
		5	Deterioration of Paint	0.00		
		16	Others	0.00		
		19	Discoloration of Materials	0.00		
Common	Utility Pipe	1	Corrosion	0.00		
		2	Crack in Steel	0.00		
		3	Loose Bolts	0.00		
		4	Fracture	0.00		
		5	Deterioration of Paint	0.00		
		16	Others	0.00		
		19	Discoloration of Materials	0.00		
		23	Deformation	0.00		
		6	Crack	0.00		
		7	Spalling / Exposed	0.00		
Common	Wheel Guard	6	Crack	0.00		
		7	Spalling / Exposed	0.00		
		8	Water Leakage	0.00		
		11	Delamination	0.00		
		16	Others	0.00		
		18	Abnormal Anchorage	0.00		
		23	Deformation	0.00		
		6	Crack	0.00		
		7	Spalling / Exposed	0.00		

Bridge Type : PC Box Girder Bridge		(same as RC Box Girder Bridge)		BMS Defects Coefficient Setting							
Element	Defect Type	Defect Coefficient	Quantity coefficient		No. of Rule						
			Ct	Dt	Ct	Dt					
Common	Abutment	6	Crack	0.43	5.00	101	101				
		7	Spalling / Exposed	0.57	5.00	101	-				
		8	Water Leakage	0.29							
		11	Delamination	0.14							
		16	Others	0.00							
		17	Reinforcing Material	0.57							
		19	Discoloration of Materials	0.14							
		20	Water Leakage	0.14							
		23	Deformation	0.14							
		Common	Bearing (rubber)	1	Corrosion	0.25	1.00	101	101		
				2	Crack in Steel	1.00	1.00	-	101		
				3	Loose Bolts	0.50					
				4	Fracture	1.00					
				5	Deterioration of Paint	0.25					
				15	Disorder of Bearing	1.00					
				16	Others	0.00					
				20	Water Leakage	0.25					
				23	Deformation	0.13					
				24	Debris	0.13					
				25	Settlement	0.88					
				Common	Bearing (steel)	1	Corrosion	0.25	1.00	101	101
						2	Crack in Steel	1.00	1.00	-	101
						3	Loose Bolts	0.50			
4	Fracture					1.00					
5	Deterioration of Paint					0.25					
15	Disorder of Bearing					0.75					
16	Others					0.00					
20	Water Leakage					0.25					
23	Deformation					0.25					
24	Debris					0.25					
25	Settlement					0.50					
Common	Bearing seat					6	Crack	0.14	-	0.25	101
		11	Delamination			0.29	0.25	0.25	101		
		16	Others			0.00					
Common	Bridge Approach	13	Difference in Level			1.00	0.25	101	101		
		14	Abnormal Pavement			0.00					
		16	Others			0.00					
Concrete Girder	Cross beam	6	Crack			0.40	2.00	201	203		
		7	Spalling / Exposed			0.80	0.01	201	-		
		8	Water Leakage			0.40					
Common	Curb	11	Delamination			0.20					
		16	Others			0.00					
		17	Reinforcing Material			0.40					
		18	Abnormal Anchorage	0.50							
		19	Discoloration of Materials	0.05							
		21	Noise / Vibration	1.00							
		23	Deformation	0.05							
		6	Crack	0.00							
		7	Spalling / Exposed	0.00							
		8	Water Leakage	0.00							
		11	Delamination	0.00							
		16	Others	0.00							
		18	Abnormal Anchorage	0.00							
		23	Deformation	0.00							

Element	Defect Type	Defect Coefficient	Quantity coefficient		No. of Rule						
			Ct	Dt	Ct	Dt					
Common	Deck Slab (concrete)	7	Spalling / Exposed	0.10	0.05	-	202				
		8	Water Leakage	0.10							
		9	Fallen out of Deck	1.00	-	1.00	201				
		10	Crack of Deck	0.75	2.00	1.00	202				
		11	Delamination	0.03							
		16	Others	0.00							
		17	Reinforcing Material	0.25							
		18	Abnormal Anchorage	0.25							
		19	Discoloration of Materials	0.03							
		Common	Drainage System	1	Corrosion	0.00					
				4	Fracture	0.00					
				5	Deterioration of Paint	0.00					
				16	Others	0.00					
				19	Discoloration of Materials	0.00					
				20	Water Leakage	0.00					
				23	Deformation	0.00					
				24	Debris	0.00					
				Common	Exp. Joints (Rubber)	12	Abnormal Spacing	0.00	1.00	103	103
						13	Difference in Level	0.00	1.00	103	103
16	Others					0.00					
20	Water Leakage					0.00	1.00	103	103		
21	Noise / Vibration					0.00					
23	Deformation					0.00	1.00	103	103		
24	Debris					0.00					
Common	Exp. Joints (Steel)					1	Corrosion	0.00	1.00	103	103
						2	Crack in Steel	0.00			
						3	Loose Bolts	0.00			
						4	Fracture	0.00	1.00	103	103
		5	Deterioration of Paint			0.00					
		12	Abnormal Spacing			0.00					
		13	Difference in Level			0.00	1.00	103	103		
		16	Others			0.00					
		20	Water Leakage			0.00					
		21	Noise / Vibration			0.00					
		23	Deformation			0.00	1.00	103	103		
		24	Debris			0.00					
		Common	Foundation	16	Others	0.00	150	101	101		
				25	Settlement	0.25	150	150	101		
				26	Scouring	1.00	150	150	101		
		Common	Inspection Facility	1	Corrosion	0.00					
				2	Crack in Steel	0.00					
				3	Loose Bolts	0.00					
				4	Fracture	0.00					
5	Deterioration of Paint			0.00							
16	Others			0.00							
20	Water Leakage			0.00							
21	Noise / Vibration			0.00							
23	Deformation			0.00							
Common	Lighting facility			1	Corrosion	0.00					
				2	Crack in Steel	0.00					
				3	Loose Bolts	0.00					
				4	Fracture	0.00					
				5	Deterioration of Paint	0.00					
				16	Others	0.00					
				19	Discoloration of Materials	0.00					
				23	Deformation	0.00					

Common	Utility Pipe	1	Corrosion	0.00						
		2	Crack in Steel	0.00						
		3	Loose Bolts	0.00						
		4	Fracture	0.00						
		5	Deterioration of Paint	0.00						
		16	Others	0.00						
		19	Discoloration of Materials	0.00						
		23	Deformation	0.00						
		Common	Wheel Guard	6	Crack	0.00				
				7	Spalling / Exposed	0.00				
				8	Water Leakage	0.00				
				11	Delamination	0.00				
				16	Others	0.00				
				18	Abnormal Anchorage	0.00				
				23	Deformation	0.00				

Concrete Box	Main Girder	6	Crack	0.33	0.50	1.00	205	205
		7	Spalling / Exposed	0.87	0.05	-	204	-
		8	Water Leakage	0.17				
		11	Delamination	0.17				
		12	Abnormal Spacing	0.17				
		16	Others	0.00				
		17	Reinforcing Material	0.30				
		18	Abnormal Anchorage	0.87				
		19	Discoloration of Materials	0.03	0.16	-	101	-
		21	Noise / Vibration	0.50				
		22	Abnormal Deflection	0.30				
		23	Deformation	0.03				

Common	Pavement	6	Crack	0.33				
		7	Spalling / Exposed	0.87				
		8	Water Leakage	0.17				
		11	Delamination	0.17				
		13	Difference in Level	0.00				
		14	Abnormal Pavement	0.00	1.00	-	104	-
		16	Others	0.00				
		24	Debris	0.00				

Common	Pier	6	Crack	0.43	10.00	10.00	101	101
		7	Spalling / Exposed	0.57	10.00	-	101	-
		8	Water Leakage	0.29				
		11	Delamination	0.14				
		16	Others	0.00				
		17	Reinforcing Material	0.57				
		19	Discoloration of Materials	0.14				
		20	Water Leakage	0.14				
		23	Deformation	0.14				

Common	Railing (concrete)	6	Crack	0.00				
		7	Spalling / Exposed	0.00				
		8	Water Leakage	0.00				
		11	Delamination	0.00				
		16	Others	0.00				
		18	Abnormal Anchorage	0.00				
		23	Deformation	0.00	-	1.00	-	102

Common	Railing (steel)	1	Corrosion	0.00				
		2	Crack in Steel	0.00				
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00				
		16	Others	0.00				
		23	Deformation	0.00	-	1.00	-	102

Common	Retaining wall	6	Crack	0.00	5.00	5.00	101	101
		7	Spalling / Exposed	0.00	5.00	-	101	-
		8	Water Leakage	0.00				
		11	Delamination	0.00				
		16	Others	0.00				
		17	Reinforcing Material	0.00				
		19	Discoloration of Materials	0.00				
		23	Deformation	0.00				
		25	Settlement	0.00	5.00		101	
		26	Scouring	0.00	5.00	5.00	101	101

Common	Road Sign	1	Corrosion	0.00				
		2	Crack in Steel	0.00				
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00				
		16	Others	0.00				
		19	Discoloration of Materials	0.00				
		23	Deformation	0.00				

Bridge Type : PC Girder Bridge		(same as RC Girder Bridge)		BMS Defects Coefficient Setting							
Element	Defect Type	Defect Coefficient	Quantity coefficient		No. of Rule						
			Ct	Dt	Ct	Dt					
Common	Abutment	6	Crack	0.43	5.00	101	101				
		7	Spalling / Exposed	0.57	5.00	101	-				
		8	Water Leakage	0.29							
		11	Delamination	0.14							
		16	Others	0.00							
		17	Reinforcing Material	0.57							
		19	Discoloration of Materials	0.14							
		20	Water Leakage	0.14							
		23	Deformation	0.14							
		Common	Bearing (rubber)	1	Corrosion	0.25	1.00	101	101		
				2	Crack in Steel	1.00	1.00	-	101		
				3	Loose Bolts	0.50					
				4	Fracture	1.00					
				5	Deterioration of Paint	0.25					
				15	Disorder of Bearing	1.00					
				16	Others	0.00					
				20	Water Leakage	0.25					
				23	Deformation	0.13					
				24	Debris	0.13					
				25	Settlement	0.88					
				Common	Bearing (steel)	1	Corrosion	0.25	1.00	101	101
						2	Crack in Steel	1.00	1.00	-	101
						3	Loose Bolts	0.50			
4	Fracture					1.00					
5	Deterioration of Paint					0.25					
15	Disorder of Bearing					0.75					
16	Others					0.00					
20	Water Leakage					0.25					
23	Deformation					0.25					
24	Debris					0.25					
25	Settlement					0.50					
Common	Bearing seat					6	Crack	0.14	-	0.25	101
		11	Delamination			0.29	0.25	0.25	101		
		16	Others			0.00					
Common	Bridge Approach	13	Difference in Level			1.00	0.25	101	101		
		14	Abnormal Pavement			0.00					
		16	Others			0.00					
Concrete Girder	Cross beam	6	Crack			0.40	2.00	201	203		
		7	Spalling / Exposed			0.80	0.01	201	-		
		8	Water Leakage			0.40					
Common	Curb	11	Delamination			0.20					
		16	Others			0.00					
		17	Reinforcing Material			0.40					
		18	Abnormal Anchorage	0.50							
		19	Discoloration of Materials	0.05							
		21	Noise / Vibration	1.00							
		23	Deformation	0.05							
		6	Crack	0.00							
		7	Spalling / Exposed	0.00							
		8	Water Leakage	0.00							
		11	Delamination	0.00							
		16	Others	0.00							
		18	Abnormal Anchorage	0.00							
		23	Deformation	0.00							

Common	Deck Slab (concrete)	7	Spalling / Exposed	0.10	0.05	-	202	-				
									8	Water Leakage	0.10	
		9	Fallen out of Deck	1.00	-	1.00	201					
		10	Crack of Deck	0.75	2.00	1.00	202					
		11	Delamination	0.03								
		16	Others	0.00								
		17	Reinforcing Material	0.25								
		18	Abnormal Anchorage	0.25								
		19	Discoloration of Materials	0.03								
Common	Drainage System	1	Corrosion	0.00								
		4	Fracture	0.00								
		5	Deterioration of Paint	0.00								
		16	Others	0.00								
		19	Discoloration of Materials	0.00								
		20	Water Leakage	0.00								
		23	Deformation	0.00								
		24	Debris	0.00								
		Common	Exp. Joints (Rubber)	12	Abnormal Spacing	0.00	1.00	1.00	103	103		
				13	Difference in Level	0.00	1.00	1.00	103	103		
				16	Others	0.00						
				20	Water Leakage	0.00	1.00	1.00	103	103		
				21	Noise / Vibration	0.00						
				23	Deformation	0.00	1.00	1.00	103	103		
				24	Debris	0.00						
				Common	Exp. Joints (Steel)	1	Corrosion	0.00	1.00	1.00	103	103
						2	Crack in Steel	0.00				
						3	Loose Bolts	0.00				
						4	Fracture	0.00	1.00	1.00	103	103
						5	Deterioration of Paint	0.00				
						12	Abnormal Spacing	0.00				
						13	Difference in Level	0.00	1.00	1.00	103	103
						16	Others	0.00				
20	Water Leakage					0.00						
21	Noise / Vibration					0.00						
23	Deformation					0.00	1.00	1.00	103	103		
24	Debris					0.00						
Common	Foundation					16	Others	0.00				
						25	Settlement	0.25	150	150	101	101
						26	Scouring	1.00	150	150	101	101
Common	Inspection Facility					1	Corrosion	0.00				
		2	Crack in Steel			0.00						
		3	Loose Bolts			0.00						
		4	Fracture			0.00						
		5	Deterioration of Paint			0.00						
		16	Others			0.00						
		20	Water Leakage			0.00						
		21	Noise / Vibration			0.00						
		23	Deformation	0.00								
		Common	Lighting facility	1	Corrosion	0.00						
				2	Crack in Steel	0.00						
				3	Loose Bolts	0.00						
				4	Fracture	0.00						
				5	Deterioration of Paint	0.00						
				16	Others	0.00						
				19	Discoloration of Materials	0.00						
				23	Deformation	0.00						

Common	Utility Pipe	1 Corrosion 2 Crack in Steel 3 Loose Bolts 4 Fracture 5 Deterioration of Paint 16 Others 19 Discoloration of Materials 23 Deformation	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	205 204 -	2.00 0.05 -	1.00 -	205 204 -
Common	Wheel Guard	6 Crack 7 Spalling / Exposed 8 Water Leakage 11 Delamination 16 Others 18 Abnormal Anchorage 23 Deformation	0.00 0.00 0.00 0.00 0.00 0.00 0.00	101 101 101 104 -	1.00 -	1.00 -	101 101 101 101 -

Concrete Girder	Main Girder	6 Crack 7 Spalling / Exposed 8 Water Leakage 11 Delamination 12 Abnormal Spacing 16 Others 17 Reinforcing Material 18 Abnormal Anchorage 19 Discoloration of Materials 21 Noise / Vibration 22 Abnormal Deflection 23 Deformation	0.33 0.67 0.17 0.17 0.00 0.30 0.67 0.03 0.50 0.30 0.03	205 204 -	2.00 0.05 -	1.00 -	205 204 -
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Common	Pavement	15 Disorder of Bearing 6 Crack 7 Spalling / Exposed 8 Water Leakage 11 Delamination 15 Disorder of Bearing 13 Difference in Level 14 Abnormal Pavement 16 Others 24 Debris	0.75 0.33 0.67 0.17 0.17 0.75 0.00 0.00 0.00 0.00	101 101 101 101 101 104 -	1.00 -	1.00 -	101 101 101 101 101 104 -
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Common	Pier	6 Crack 7 Spalling / Exposed 8 Water Leakage 11 Delamination 16 Others 17 Reinforcing Material 19 Discoloration of Materials 20 Water Leakage 23 Deformation	0.43 0.67 0.29 0.14 0.00 0.57 0.14 0.14	101 101 -	10.00 10.00 -	10.00 -	101 101 -
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Common	Railing (concrete)	6 Crack 7 Spalling / Exposed 8 Water Leakage 11 Delamination 16 Others 18 Abnormal Anchorage 23 Deformation	0.00 0.00 0.00 0.00 0.00 0.00 0.00	102	-	1.00	-	102
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Common	Railing (steel)	1 Corrosion 2 Crack in Steel 3 Loose Bolts 4 Fracture 5 Deterioration of Paint 16 Others 23 Deformation	0.00 0.00 0.00 0.00 0.00 0.00 0.00	102	-	1.00	-	102
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Common	Retaining wall	6 Crack 7 Spalling / Exposed 8 Water Leakage 11 Delamination 16 Others 17 Reinforcing Material 19 Discoloration of Materials 23 Deformation 25 Settlement 26 Scouring	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	101 101 -	5.00 5.00 -	5.00 -	101 101 -
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Common	Road Sign	1 Corrosion 2 Crack in Steel 3 Loose Bolts 4 Fracture 5 Deterioration of Paint 16 Others 19 Discoloration of Materials 23 Deformation	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	101 101 -	-	-	101 101 -
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Bridge Type : Portable Steel Bridge			BMS Defects Coefficient Setting					
Common	Element	Defect Type	Defect Coefficient	Quantity coefficient		No. of Rule		
				Ct	Dt	Ct	Dt	
Common	Deck Slab (steel)	1	Corrosion	0.50	1.50	201	201	
		2	Crack in Steel	1.00	1.00	201	201	
		3	Loose Bolts	0.17	1.00	201	201	
		4	Fracture	1.00	1.00	201	201	
		5	Deterioration of Paint	0.17	1.00	201	201	
		6	Others	0.00	1.00	201	201	
		7	Noise / Vibration	0.17	1.00	201	201	
		8	Deformation	0.17	1.00	201	201	
		9	Corrosion	0.00	1.00	101	101	
		10	Crack in Steel	0.00	1.00	101	101	
		11	Loose Bolts	0.00	1.00	101	101	
		12	Fracture	0.00	1.00	101	101	
Common	Drainage System	1	Corrosion	0.00	1.00	101	101	
		2	Crack in Steel	0.00	1.00	101	101	
		3	Loose Bolts	0.00	1.00	101	101	
		4	Fracture	0.00	1.00	101	101	
		5	Deterioration of Paint	0.00	1.00	101	101	
		6	Others	0.00	1.00	101	101	
		7	Noise / Vibration	0.00	1.00	101	101	
		8	Deformation	0.00	1.00	101	101	
		9	Abnormal Spacing	0.00	1.00	101	101	
		10	Difference in Level	0.00	1.00	101	101	
		11	Others	0.00	1.00	101	101	
		Common	Exp. Joints (rubber)	1	Corrosion	0.00	1.00	103
2	Crack in Steel			0.00	1.00	103	103	
3	Loose Bolts			0.00	1.00	103	103	
4	Fracture			0.00	1.00	103	103	
5	Deterioration of Paint			0.00	1.00	103	103	
6	Others			0.00	1.00	103	103	
7	Noise / Vibration			0.00	1.00	103	103	
8	Deformation			0.00	1.00	103	103	
9	Abnormal Spacing			0.00	1.00	103	103	
10	Difference in Level			0.00	1.00	103	103	
11	Others			0.00	1.00	103	103	
Common	Exp. Joints (Steel)			1	Corrosion	0.00	1.00	103
		2	Crack in Steel	0.00	1.00	103	103	
		3	Loose Bolts	0.00	1.00	103	103	
		4	Fracture	0.00	1.00	103	103	
		5	Deterioration of Paint	0.00	1.00	103	103	
		6	Others	0.00	1.00	103	103	
		7	Noise / Vibration	0.00	1.00	103	103	
		8	Deformation	0.00	1.00	103	103	
		9	Abnormal Spacing	0.00	1.00	103	103	
		10	Difference in Level	0.00	1.00	103	103	
		11	Others	0.00	1.00	103	103	
		Common	Foundation	16	Others	0.00	150	101
17	Settlement			0.25	150	101	101	
18	Scouring			1.00	150	101	101	
Portable Steel Truss Steel Arch	Lateral Bracing	1	Corrosion	0.00	3.00	201	201	
		2	Crack in Steel	0.00	1.00	101	101	
		3	Loose Bolts	0.00	1.00	101	101	
		4	Fracture	0.00	1.00	101	101	
		5	Deterioration of Paint	0.00	1.00	101	101	
		6	Others	0.00	1.00	101	101	
		7	Noise / Vibration	0.00	1.00	101	101	
		8	Deformation	0.00	1.00	101	101	
Common	Lighting facility	1	Corrosion	0.00	1.00	101	101	
		2	Crack in Steel	0.00	1.00	101	101	
		3	Loose Bolts	0.00	1.00	101	101	
		4	Fracture	0.00	1.00	101	101	
		5	Deterioration of Paint	0.00	1.00	101	101	
		6	Others	0.00	1.00	101	101	
		7	Noise / Vibration	0.00	1.00	101	101	
		8	Deformation	0.00	1.00	101	101	
		9	Abnormal Spacing	0.00	1.00	101	101	
		10	Difference in Level	0.00	1.00	101	101	
		11	Others	0.00	1.00	101	101	
		Common	Disorder of Bearing	15	Disorder of Bearing	0.75	1.00	101
16	Crack			0.33	1.00	101	101	
17	Spalling / Exposed			0.87	1.00	101	101	
18	Water Leakage			0.17	1.00	101	101	
19	Delamination			0.17	1.00	101	101	
20	Abnormal Anchorage			0.00	1.00	101	101	
21	Deformation			0.00	1.00	101	101	
22	Corrosion			0.00	1.00	101	101	
23	Crack in Steel			0.00	1.00	101	101	
24	Loose Bolts			0.00	1.00	101	101	
25	Fracture			0.00	1.00	101	101	
26	Deterioration of Paint			0.00	1.00	101	101	
27	Others	0.00	1.00	101	101			
28	Noise / Vibration	0.00	1.00	101	101			
29	Deformation	0.00	1.00	101	101			

Bridge Type : Portable Steel Bridge			BMS Defects Coefficient Setting						
Common	Element	Defect Type	Defect Coefficient	Quantity coefficient		No. of Rule			
				Ct	Dt	Ct	Dt		
Common	Abutment	6	Crack	0.43	5.00	101	101		
		7	Spalling / Exposed	0.57	5.00	101	101		
		8	Water Leakage	0.29					
		9	Delamination	0.14					
		10	Others	0.00					
		11	Reinforcing Material	0.57					
		12	Discoloration of Materials	0.14					
		13	Water Leakage	0.14					
		14	Deformation	0.14					
		15	Corrosion	0.25	1.00	101	101		
		16	Crack in Steel	1.00	1.00	101	101		
		17	Loose Bolts	0.50	1.00	101	101		
		18	Fracture	1.00	1.00	101	101		
		19	Deterioration of Paint	0.25	1.00	101	101		
		20	Disorder of Bearing	1.00	1.00	101	101		
		21	Others	0.00	1.00	101	101		
		22	Water Leakage	0.25	1.00	101	101		
		23	Deformation	0.13	1.00	101	101		
		24	Debris	0.13	1.00	101	101		
		25	Settlement	0.88	1.00	101	101		
		Common	Bearing (steel)	1	Corrosion	0.25	1.00	101	101
				2	Crack in Steel	1.00	1.00	101	101
				3	Loose Bolts	0.50	1.00	101	101
4	Fracture			1.00	1.00	101	101		
5	Deterioration of Paint			0.25	1.00	101	101		
6	Disorder of Bearing			0.75	1.00	101	101		
7	Others			0.00	1.00	101	101		
8	Water Leakage			0.25	1.00	101	101		
9	Deformation			0.25	1.00	101	101		
10	Debris			0.25	1.00	101	101		
11	Settlement			0.50	1.00	101	101		
Common	Bearing seat			6	Crack	0.14	0.25	101	101
		7	Delamination	0.29	0.25	101	101		
		8	Others	0.00	0.25	101	101		
Common	Bridge Approach	13	Difference in Level	0.00					
		14	Abnormal Pavement	0.00					
		15	Others	0.00					
		16	Debris	0.00					
Portable Steel Truss Steel Arch	Cross beam	1	Corrosion	0.33	3.00	101	101		
		2	Crack in Steel	1.00	1.00	101	101		
		3	Loose Bolts	0.17	1.00	101	101		
		4	Fracture	1.00	1.00	101	101		
		5	Deterioration of Paint	0.17	1.40	201	101		
		6	Others	0.00	1.00	101	101		
		7	Noise / Vibration	0.33	1.00	101	101		
		8	Deformation	0.17	1.00	101	101		
Common	Curb	6	Crack	0.00					
		7	Spalling / Exposed	0.00					
		8	Water Leakage	0.00					
		9	Delamination	0.00					
		10	Others	0.00					
		11	Abnormal Anchorage	0.00					
		12	Deformation	0.00					
		13	Corrosion	0.00					

Common	Utility Pipe	1	Corrosion	0.00					
		2	Crack in Steel	0.00					
		3	Loose Bolts	0.00					
		4	Fracture	0.00					
		5	Deterioration of Paint	0.00					
		16	Others	0.00					
		19	Discoloration of Materials	0.00					
		23	Deformation	0.00					
		6	Crack	0.00					
		7	Spalling / Exposed	0.00					
		8	Water Leakage	0.00					
		11	Delamination	0.00					
		16	Others	0.00					
		18	Abnormal Anchorage	0.00					
		23	Deformation	0.00					

Portable Steel Truss	Main Truss	1	Corrosion	0.80	3.00	3.00	101	101
		2	Crack in Steel	1.00	1.00	1.00	101	101
		3	Loose Bolts	0.20				
		4	Fracture	1.00				
		5	Deterioration of Paint	0.20	1.00		208	
		12	Abnormal Spacing	0.00				
		16	Others	0.00				
		17	Reinforcing Material	0.20				
		20	Water Leakage	0.20				
		21	Noise / Vibration	0.20				
		22	Abnormal Deflection	0.20				
		23	Deformation	0.20				

Common	Pavement	13	Difference in Level	0.00				
		14	Abnormal Pavement	0.00				
		16	Others	0.00	1.00		104	
		24	Debris	0.00				

Common	Pier	6	Crack	0.43	10.00	10.00	101	101
		7	Spalling / Exposed	0.57	10.00		101	
		8	Water Leakage	0.29				
		11	Delamination	0.14				
		16	Others	0.00				
		17	Reinforcing Material	0.57				
		19	Discoloration of Materials	0.14				
		20	Water Leakage	0.14				
		23	Deformation	0.14				

Common	Railing (steel)	1	Corrosion	0.00				
		2	Crack in Steel	0.00				
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00				
		16	Others	0.00				
		23	Deformation	0.00				

Common	Retaining wall	6	Crack	0.00	5.00	5.00	101	101
		7	Spalling / Exposed	0.00	5.00		101	
		8	Water Leakage	0.00				
		11	Delamination	0.00				
		16	Others	0.00				
		17	Reinforcing Material	0.00				
		19	Discoloration of Materials	0.00				
		23	Deformation	0.00				
		25	Settlement	0.00	5.00		101	
		26	Scouring	0.00	5.00	5.00	101	101

Common	Road Sign	1	Corrosion	0.00				
		2	Crack in Steel	0.00				
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00				
		16	Others	0.00				
		19	Discoloration of Materials	0.00				
		23	Deformation	0.00				

Portable Steel Truss Steel Arch	Stringer	1	Corrosion	0.00	0.70	0.70	102	102
		2	Crack in Steel	0.00	1.00	1.00	101	101
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00	0.70		102	
		16	Others	0.00				
		17	Reinforcing Material	0.00				
		21	Noise / Vibration	0.00				
		22	Abnormal Deflection	0.00				
		23	Deformation	0.00				

Bridge Type : RC Box Girder Bridge		(same as PC Box Girder Bridge)		BMS Defects Coefficient Setting							
Element	Defect Type	Defect Coefficient	Quantity coefficient		No. of Rule						
			Ct	Dt	Ct	Dt					
Common	Abutment	6	Crack	0.43	5.00	101	101				
		7	Spalling / Exposed	0.57	5.00	101	-				
		8	Water Leakage	0.29							
		11	Delamination	0.14							
		16	Others	0.00							
		17	Reinforcing Material	0.57							
		19	Discoloration of Materials	0.14							
		20	Water Leakage	0.14							
		23	Deformation	0.14							
		Common	Bearing (rubber)	1	Corrosion	0.25	1.00	101	101		
				2	Crack in Steel	1.00	1.00	-	101		
				3	Loose Bolts	0.50					
				4	Fracture	1.00					
				5	Deterioration of Paint	0.25					
				15	Disorder of Bearing	1.00					
				16	Others	0.00					
				20	Water Leakage	0.25					
				23	Deformation	0.13					
				24	Debris	0.13					
				25	Settlement	0.88					
				Common	Bearing (steel)	1	Corrosion	0.25	1.00	101	101
						2	Crack in Steel	1.00	1.00	-	101
						3	Loose Bolts	0.50			
4	Fracture					1.00					
5	Deterioration of Paint					0.25					
15	Disorder of Bearing					0.75					
16	Others					0.00					
20	Water Leakage					0.25					
23	Deformation					0.25					
24	Debris					0.25					
25	Settlement					0.50					
Common	Bearing seat					6	Crack	0.14	-	0.25	101
		11	Delamination			0.29	0.25	0.25	101		
		16	Others			0.00					
Common	Bridge Approach	13	Difference in Level			1.00	0.25	101	101		
		14	Abnormal Pavement			0.00					
		16	Others			0.00					
Concrete Girder	Cross beam	6	Crack			0.40	2.00	201	203		
		7	Spalling / Exposed			0.80	0.01	201	-		
		8	Water Leakage			0.40					
Common	Curb	11	Delamination			0.20					
		16	Others			0.00					
		17	Reinforcing Material			0.40					
		18	Abnormal Anchorage	0.50							
		19	Discoloration of Materials	0.05							
		21	Noise / Vibration	1.00							
		23	Deformation	0.05							
		6	Crack	0.00							
		7	Spalling / Exposed	0.00							
		8	Water Leakage	0.00							
		11	Delamination	0.00							
		16	Others	0.00							
		18	Abnormal Anchorage	0.00							
		23	Deformation	0.00							

Common	Deck Slab (concrete)	7	Spalling / Exposed	0.10	0.05	-	202	-				
		8	Water Leakage	0.10								
		9	Fallen out of Deck	1.00	-	1.00	-	201				
		10	Crack of Deck	0.75	2.00	1.00	202					
		11	Delamination	0.03								
		16	Others	0.00								
		17	Reinforcing Material	0.25								
		18	Abnormal Anchorage	0.25								
		19	Discoloration of Materials	0.03								
		Common	Drainage System	1	Corrosion	0.00						
				4	Fracture	0.00						
				5	Deterioration of Paint	0.00						
				16	Others	0.00						
				19	Discoloration of Materials	0.00						
				20	Water Leakage	0.00						
				23	Deformation	0.00						
				24	Debris	0.00						
				Common	Exp. Joints (Rubber)	12	Abnormal Spacing	0.00	1.00	1.00	103	103
						13	Difference in Level	0.00	1.00	1.00	103	103
16	Others					0.00						
20	Water Leakage					0.00	1.00	1.00	103	103		
21	Noise / Vibration					0.00						
23	Deformation					0.00	1.00	1.00	103	103		
24	Debris					0.00						
Common	Exp. Joints (Steel)					1	Corrosion	0.00	1.00	1.00	103	103
						2	Crack in Steel	0.00				
						3	Loose Bolts	0.00				
						4	Fracture	0.00	1.00	1.00	103	103
		5	Deterioration of Paint			0.00						
		12	Abnormal Spacing			0.00						
		13	Difference in Level			0.00	1.00	1.00	103	103		
		16	Others			0.00						
		20	Water Leakage			0.00						
		21	Noise / Vibration			0.00						
		23	Deformation			0.00	1.00	1.00	103	103		
		24	Debris			0.00						
		Common	Foundation	16	Others	0.00						
				25	Settlement	0.25	150	150	101	101		
				26	Scouring	1.00	150	150	101	101		
		Common	Inspection Facility	1	Corrosion	0.00						
				2	Crack in Steel	0.00						
				3	Loose Bolts	0.00						
				4	Fracture	0.00						
5	Deterioration of Paint			0.00								
16	Others			0.00								
20	Water Leakage			0.00								
21	Noise / Vibration			0.00								
23	Deformation			0.00								
Common	Lighting facility			1	Corrosion	0.00						
				2	Crack in Steel	0.00						
				3	Loose Bolts	0.00						
				4	Fracture	0.00						
				5	Deterioration of Paint	0.00						
				16	Others	0.00						
				19	Discoloration of Materials	0.00						
				23	Deformation	0.00						

Common	Utility Pipe	1 Corrosion 0.00						
		2 Crack in Steel 0.00						
		3 Loose Bolts 0.00						
		4 Fracture 0.00						
		5 Deterioration of Paint 0.00						
		16 Others 0.00						
		19 Discoloration of Materials 0.00						
		23 Deformation 0.00						
Common	Wheel Guard	6 Crack 0.00						
		7 Spalling / Exposed 0.00						
		8 Water Leakage 0.00						
		11 Delamination 0.00						
		16 Others 0.00						
		18 Abnormal Anchorage 0.00						
		23 Deformation 0.00						

Concrete Box	Main Girder	6 Crack 0.33	0.50	1.00	205	205
		7 Spalling / Exposed 0.67	0.05	-	204	-
		8 Water Leakage 0.17				
		11 Delamination 0.17				
		12 Abnormal Spacing 0.17				
		16 Others 0.00				
		17 Reinforcing Material 0.30				
		18 Abnormal Anchorage 0.67	0.16	-	101	-
		19 Discoloration of Materials 0.03				
		21 Noise / Vibration 0.50				
		22 Abnormal Deflection 0.30				
		23 Deformation 0.03				

		15 Disorder of Bearing 0.75	1.00	1.00	101	101
		6 Crack 0.33				
		7 Spalling / Exposed 0.67				
		8 Water Leakage 0.17				
		11 Delamination 0.17				
		15 Disorder of Bearing 0.75	1.00	1.00	101	101
Common	Pavement	13 Difference in Level 0.00				
		14 Abnormal Pavement 0.00	1.00	-	104	-
		16 Others 0.00				
		24 Debris 0.00				

Common	Pier	6 Crack 0.43	10.00	10.00	101	101
		7 Spalling / Exposed 0.57	10.00	-	101	-
		8 Water Leakage 0.29				
		11 Delamination 0.14				
		16 Others 0.00				
		17 Reinforcing Material 0.57				
		19 Discoloration of Materials 0.14				
		20 Water Leakage 0.14				
		23 Deformation 0.14				

Common	Railing (concrete)	6 Crack 0.00				
		7 Spalling / Exposed 0.00				
		8 Water Leakage 0.00				
		11 Delamination 0.00				
		16 Others 0.00				
		18 Abnormal Anchorage 0.00				
		23 Deformation 0.00	-	1.00	-	102

Common	Railing (steel)	1 Corrosion 0.00				
		2 Crack in Steel 0.00				
		3 Loose Bolts 0.00				
		4 Fracture 0.00				
		5 Deterioration of Paint 0.00				
		16 Others 0.00				
		23 Deformation 0.00	-	1.00	-	102

Common	Retaining wall	6 Crack 0.00	5.00	5.00	101	101
		7 Spalling / Exposed 0.00	5.00	-	101	-
		8 Water Leakage 0.00				
		11 Delamination 0.00				
		16 Others 0.00				
		17 Reinforcing Material 0.00				
		19 Discoloration of Materials 0.00				
		23 Deformation 0.00	5.00		101	
		25 Settlement 0.00	5.00	5.00	101	101
		26 Scouring 0.00				

Common	Road Sign	1 Corrosion 0.00				
		2 Crack in Steel 0.00				
		3 Loose Bolts 0.00				
		4 Fracture 0.00				
		5 Deterioration of Paint 0.00				
		16 Others 0.00				
		19 Discoloration of Materials 0.00				
		23 Deformation 0.00				

Bridge Type : RC Girder Bridge		(same as PC Girder Bridge)		BMS Defects Coefficient Setting							
Element	Defect Type	Defect Coefficient	Quantity coefficient		No. of Rule						
			Ct	Dt	Ct	Dt					
Common	Abutment	6	Crack	0.43	5.00	101	101				
		7	Spalling / Exposed	0.57	5.00	101	-				
		8	Water Leakage	0.29							
		11	Delamination	0.14							
		16	Others	0.00							
		17	Reinforcing Material	0.57							
		19	Discoloration of Materials	0.14							
		20	Water Leakage	0.14							
		23	Deformation	0.14							
		Common	Bearing (rubber)	1	Corrosion	0.25	1.00	101	101		
				2	Crack in Steel	1.00	1.00	-	101		
				3	Loose Bolts	0.50					
				4	Fracture	1.00					
				5	Deterioration of Paint	0.25					
				15	Disorder of Bearing	1.00					
				16	Others	0.00					
				20	Water Leakage	0.25					
				23	Deformation	0.13					
				24	Debris	0.13					
				25	Settlement	0.88					
				Common	Bearing (steel)	1	Corrosion	0.25	1.00	101	101
						2	Crack in Steel	1.00	1.00	-	101
						3	Loose Bolts	0.50			
4	Fracture					1.00					
5	Deterioration of Paint					0.25					
15	Disorder of Bearing					0.75					
16	Others					0.00					
20	Water Leakage					0.25					
23	Deformation					0.25					
24	Debris					0.25					
25	Settlement					0.50					
Common	Bearing seat					6	Crack	0.14	-	0.25	101
		11	Delamination			0.29	0.25	0.25	101		
		16	Others			0.00					
Common	Bridge Approach	13	Difference in Level			1.00	0.25	101	101		
		14	Abnormal Pavement			0.00					
		16	Others			0.00					
Concrete Girder	Cross beam	6	Crack			0.40	2.00	201	203		
		7	Spalling / Exposed			0.80	0.01	201	-		
		8	Water Leakage			0.40					
Common	Curb	11	Delamination			0.20					
		16	Others			0.00					
		17	Reinforcing Material			0.40					
		18	Abnormal Anchorage	0.50							
		19	Discoloration of Materials	0.05							
		21	Noise / Vibration	1.00							
		23	Deformation	0.05							
		6	Crack	0.00							
		7	Spalling / Exposed	0.00							
		8	Water Leakage	0.00							
		11	Delamination	0.00							
		16	Others	0.00							
		18	Abnormal Anchorage	0.00							
		23	Deformation	0.00							

Element	Defect Type	Defect Coefficient	Quantity coefficient		No. of Rule						
			Ct	Dt	Ct	Dt					
Common	Deck Slab (concrete)	7	Spalling / Exposed	0.10	0.05	-	202				
		8	Water Leakage	0.10							
		9	Fallen out of Deck	1.00	-	1.00	201				
		10	Crack of Deck	0.75	2.00	1.00	202				
		11	Delamination	0.03							
		16	Others	0.00							
		17	Reinforcing Material	0.25							
		18	Abnormal Anchorage	0.25							
		19	Discoloration of Materials	0.03							
		Common	Drainage System	1	Corrosion	0.00					
				4	Fracture	0.00					
				5	Deterioration of Paint	0.00					
				16	Others	0.00					
				19	Discoloration of Materials	0.00					
				20	Water Leakage	0.00					
				23	Deformation	0.00					
				24	Debris	0.00					
				Common	Exp. Joints (Rubber)	12	Abnormal Spacing	0.00	1.00	103	103
						13	Difference in Level	0.00	1.00	103	103
16	Others					0.00					
20	Water Leakage					0.00	1.00	103	103		
21	Noise / Vibration					0.00					
23	Deformation					0.00	1.00	103	103		
24	Debris					0.00					
Common	Exp. Joints (Steel)					1	Corrosion	0.00	1.00	103	103
						2	Crack in Steel	0.00			
						3	Loose Bolts	0.00			
						4	Fracture	0.00	1.00	103	103
		5	Deterioration of Paint			0.00					
		12	Abnormal Spacing			0.00					
		13	Difference in Level			0.00	1.00	103	103		
		16	Others			0.00					
		20	Water Leakage			0.00					
		21	Noise / Vibration			0.00					
		23	Deformation			0.00	1.00	103	103		
		24	Debris			0.00					
		Common	Foundation	16	Others	0.00	150	101	101		
				25	Settlement	0.25	150	150	101		
				26	Scouring	1.00	150	150	101		
		Common	Inspection Facility	1	Corrosion	0.00					
				2	Crack in Steel	0.00					
				3	Loose Bolts	0.00					
				4	Fracture	0.00					
5	Deterioration of Paint			0.00							
16	Others			0.00							
20	Water Leakage			0.00							
21	Noise / Vibration			0.00							
23	Deformation			0.00							
Common	Lighting facility			1	Corrosion	0.00					
				2	Crack in Steel	0.00					
				3	Loose Bolts	0.00					
				4	Fracture	0.00					
				5	Deterioration of Paint	0.00					
				16	Others	0.00					
				19	Discoloration of Materials	0.00					
				23	Deformation	0.00					

Common	Utility Pipe	1 Corrosion 0.00						
		2 Crack in Steel 0.00						
		3 Loose Bolts 0.00						
		4 Fracture 0.00						
		5 Deterioration of Paint 0.00						
		16 Others 0.00						
		19 Discoloration of Materials 0.00						
		23 Deformation 0.00						
Common	Wheel Guard	6 Crack 0.00						
		7 Spalling / Exposed 0.00						
		8 Water Leakage 0.00						
		11 Delamination 0.00						
		16 Others 0.00						
		18 Abnormal Anchorage 0.00						
		23 Deformation 0.00						

Concrete Girder	Main Girder	6 Crack 0.33	2.00	1.00	205	205
		7 Spalling / Exposed 0.67	0.05	-	204	-
		8 Water Leakage 0.17				
		11 Delamination 0.17				
		12 Abnormal Spacing 0.17				
		16 Others 0.00				
		17 Reinforcing Material 0.30				
		18 Abnormal Anchorage 0.67	0.16	-	101	-
		19 Discoloration of Materials 0.03				
		21 Noise / Vibration 0.50				
		22 Abnormal Deflection 0.30				
		23 Deformation 0.03				

		15 Disorder of Bearing 0.75	1.00	1.00	101	101
		6 Crack 0.33				
		7 Spalling / Exposed 0.67				
		8 Water Leakage 0.17				
		11 Delamination 0.17				
		15 Disorder of Bearing 0.75	1.00	1.00	101	101
Common	Pavement	13 Difference in Level 0.00				
		14 Abnormal Pavement 0.00	1.00	-	104	-
		16 Others 0.00				
		24 Debris 0.00				

Common	Pier	6 Crack 0.43	10.00	10.00	101	101
		7 Spalling / Exposed 0.57	10.00	-	101	-
		8 Water Leakage 0.29				
		11 Delamination 0.14				
		16 Others 0.00				
		17 Reinforcing Material 0.57				
		19 Discoloration of Materials 0.14				
		20 Water Leakage 0.14				
		23 Deformation 0.14				

Common	Railing (concrete)	6 Crack 0.00				
		7 Spalling / Exposed 0.00				
		8 Water Leakage 0.00				
		11 Delamination 0.00				
		16 Others 0.00				
		18 Abnormal Anchorage 0.00				
		23 Deformation 0.00	-	1.00	-	102

Common	Railing (steel)	1 Corrosion 0.00				
		2 Crack in Steel 0.00				
		3 Loose Bolts 0.00				
		4 Fracture 0.00				
		5 Deterioration of Paint 0.00				
		16 Others 0.00				
		23 Deformation 0.00	-	1.00	-	102

Common	Retaining wall	6 Crack 0.00	5.00	5.00	101	101
		7 Spalling / Exposed 0.00	5.00	-	101	-
		8 Water Leakage 0.00				
		11 Delamination 0.00				
		16 Others 0.00				
		17 Reinforcing Material 0.00				
		19 Discoloration of Materials 0.00				
		23 Deformation 0.00	5.00		101	
		25 Settlement 0.00	5.00	5.00	101	101
		26 Scouring 0.00				

Common	Road Sign	1 Corrosion 0.00				
		2 Crack in Steel 0.00				
		3 Loose Bolts 0.00				
		4 Fracture 0.00				
		5 Deterioration of Paint 0.00				
		16 Others 0.00				
		19 Discoloration of Materials 0.00				
		23 Deformation 0.00				

Bridge Type : Rigid Frame Bridge		BMS Defects Coefficient Setting									
Element	Defect Type	Defect Coefficient	Quantity coefficient		No. of Rule						
			Ct	Dt	Ct	Dt					
Common	Abutment	6 Crack	5.00	5.00	101	101					
		7 Spalling / Exposed	5.00	5.00	101	101					
		8 Water Leakage									
		11 Delamination									
		16 Others									
		17 Reinforcing Material									
		19 Discoloration of Materials									
		20 Water Leakage									
		23 Deformation									
		1 Corrosion	0.25	1.00	1.00	101	101				
		2 Crack in Steel	1.00	1.00	1.00	101	101				
		3 Loose Bolts	0.50								
		4 Fracture	1.00	1.00	1.00	101	101				
		5 Deterioration of Paint	0.25								
		15 Disorder of Bearing	1.00								
		16 Others	0.00								
		20 Water Leakage	0.25								
		23 Deformation	0.13								
		24 Debris	0.13								
		25 Settlement	0.88								
		Common	Bearing (rubber)	1 Corrosion	0.25	1.00	1.00	101			
				2 Crack in Steel	1.00	1.00	1.00	101			
				3 Loose Bolts	0.50						
4 Fracture	1.00			1.00	1.00	101	101				
5 Deterioration of Paint	0.25										
15 Disorder of Bearing	1.00										
16 Others	0.00										
20 Water Leakage	0.25										
23 Deformation	0.13										
24 Debris	0.13										
25 Settlement	0.88										
Common	Bearing (steel)			1 Corrosion	0.25	1.00	1.00	101			
				2 Crack in Steel	1.00	1.00	1.00	101			
				3 Loose Bolts	0.50						
				4 Fracture	1.00	1.00	1.00	101	101		
				5 Deterioration of Paint	0.25						
				15 Disorder of Bearing	0.75						
				16 Others	0.00						
				20 Water Leakage	0.25						
				23 Deformation	0.25						
				24 Debris	0.25						
				25 Settlement	0.50						
				Common	Beaing seat	6 Crack	0.14	0.25	0.25	101	
		11 Delamination	0.29			0.25	0.25	101			
		16 Others	0.00								
		23 Deformation	1.00			0.25	0.25	101			
		13 Difference in Level	0.00								
		14 Abnormal Pavement	0.00								
		16 Others	0.00								
		24 Debris	0.00								
		Common	Bridge Approach			6 Crack	0.40	2.00	201	203	
						7 Spalling / Exposed	0.80	0.01	201	201	
						8 Water Leakage	0.40				
						11 Delamination	0.20				
16 Others	0.00										
17 Reinforcing Material	0.40										
18 Abnormal Anchorage	0.50										
19 Discoloration of Materials	0.05										
21 Noise / Vibration	1.00										
23 Deformation	0.05										
Common	Curb					6 Crack	0.00				
						7 Spalling / Exposed	0.00				
						8 Water Leakage	0.00				
						11 Delamination	0.00				
						16 Others	0.00				
				18 Abnormal Anchorage	0.00						
				23 Deformation	0.00						

Element	Defect Type	Defect Coefficient	Quantity coefficient		No. of Rule					
			Ct	Dt	Ct	Dt				
Common	Deck Slab (concrete)	7 Spalling / Exposed	0.10	0.05	202	202				
		8 Water Leakage	0.10							
		9 Fallen out of Deck	1.00	1.00	1.00	201				
		10 Crack of Deck	0.75	2.00	1.00	202				
		11 Delamination	0.03							
		16 Others	0.00							
		17 Reinforcing Material	0.25							
		18 Abnormal Anchorage	0.25							
		19 Discoloration of Materials	0.03							
		Common	Drainage System	1 Corrosion	0.00					
				4 Fracture	0.00					
				5 Deterioration of Paint	0.00					
				16 Others	0.00					
				19 Discoloration of Materials	0.00					
				20 Water Leakage	0.00					
				23 Deformation	0.00					
				24 Debris	0.00					
				Common	Exp. Joints (Rubber)	12 Abnormal Spacing	0.00	1.00	103	103
						13 Difference in Level	0.00	1.00	1.00	103
						16 Others	0.00			
						20 Water Leakage	0.00	1.00	1.00	103
						21 Noise / Vibration	0.00			
						23 Deformation	0.00	1.00	1.00	103
24 Debris	0.00									
Common	Exp. Joints (Steel)					1 Corrosion	0.00	1.00	103	103
						2 Crack in Steel	0.00			
						3 Loose Bolts	0.00			
						4 Fracture	0.00	1.00	1.00	103
						5 Deterioration of Paint	0.00			
						12 Abnormal Spacing	0.00			
						13 Difference in Level	0.00	1.00	1.00	103
						16 Others	0.00			
		20 Water Leakage	0.00							
		21 Noise / Vibration	0.00							
		23 Deformation	0.00			1.00	1.00	103		
		24 Debris	0.00							
		Common	Foundation			16 Others	0.00			
						25 Settlement	0.25	150	150	101
						26 Scouring	1.00	150	150	101
						Common	Inspection Facility	1 Corrosion	0.00	
				2 Crack in Steel	0.00					
				3 Loose Bolts	0.00					
				4 Fracture	0.00					
				5 Deterioration of Paint	0.00					
				16 Others	0.00					
				20 Water Leakage	0.00					
				21 Noise / Vibration	0.00					
23 Deformation	0.00									
Common	Lighting facility			1 Corrosion	0.00					
				2 Crack in Steel	0.00					
				3 Loose Bolts	0.00					
				4 Fracture	0.00					
				5 Deterioration of Paint	0.00					
				16 Others	0.00					
				19 Discoloration of Materials	0.00					
				23 Deformation	0.00					

Common	Utility Pipe	1 Corrosion 0.00						
		2 Crack in Steel 0.00						
		3 Loose Bolts 0.00						
		4 Fracture 0.00						
		5 Deterioration of Paint 0.00						
		16 Others 0.00						
		19 Discoloration of Materials 0.00						
		23 Deformation 0.00						
Common	Wheel Guard	6 Crack 0.00						
		7 Spalling / Exposed 0.00						
		8 Water Leakage 0.00						
		11 Delamination 0.00						
		16 Others 0.00						
		18 Abnormal Anchorage 0.00						
		23 Deformation 0.00						

Concrete Girder	Main Girder	6 Crack 0.33	2.00	1.00	205	205
		7 Spalling / Exposed 0.67	0.05	-	204	-
		8 Water Leakage 0.17				
		11 Delamination 0.17				
		12 Abnormal Spacing 0.17				
		16 Others 0.00				
		17 Reinforcing Material 0.30				
		18 Abnormal Anchorage 0.67	0.16	-	101	-
		19 Discoloration of Materials 0.03				
		21 Noise / Vibration 0.50				
		22 Abnormal Deflection 0.30				
		23 Deformation 0.03				

		15 Disorder of Bearing 0.75	1.00	1.00	101	101
		6 Crack 0.33				
		7 Spalling / Exposed 0.67				
		8 Water Leakage 0.17				
		11 Delamination 0.17				
		15 Disorder of Bearing 0.75	1.00	1.00	101	101
Common	Pavement	13 Difference in Level 0.00				
		14 Abnormal Pavement 0.00	1.00	-	104	-
		16 Others 0.00				
		24 Debris 0.00				

Common	Pier	6 Crack 0.43	10.00	10.00	101	101
		7 Spalling / Exposed 0.57	10.00	-	101	-
		8 Water Leakage 0.29				
		11 Delamination 0.14				
		16 Others 0.00				
		17 Reinforcing Material 0.57				
		19 Discoloration of Materials 0.14				
		20 Water Leakage 0.14				
		23 Deformation 0.14				

Common	Railing (concrete)	6 Crack 0.00				
		7 Spalling / Exposed 0.00				
		8 Water Leakage 0.00				
		11 Delamination 0.00				
		16 Others 0.00				
		18 Abnormal Anchorage 0.00				
		23 Deformation 0.00	-	1.00	-	102

Common	Railing (steel)	1 Corrosion 0.00				
		2 Crack in Steel 0.00				
		3 Loose Bolts 0.00				
		4 Fracture 0.00				
		5 Deterioration of Paint 0.00				
		16 Others 0.00				
		23 Deformation 0.00	-	1.00	-	102

Common	Retaining wall	6 Crack 0.00	5.00	5.00	101	101
		7 Spalling / Exposed 0.00	5.00	-	101	-
		8 Water Leakage 0.00				
		11 Delamination 0.00				
		16 Others 0.00				
		17 Reinforcing Material 0.00				
		19 Discoloration of Materials 0.00				
		23 Deformation 0.00	5.00		101	
		25 Settlement 0.00	5.00	5.00	101	101
		26 Scouring 0.00				

Common	Road Sign	1 Corrosion 0.00				
		2 Crack in Steel 0.00				
		3 Loose Bolts 0.00				
		4 Fracture 0.00				
		5 Deterioration of Paint 0.00				
		16 Others 0.00				
		19 Discoloration of Materials 0.00				
		23 Deformation 0.00				

Bridge Type : Small Slab Bridge		BMS Defects Coefficient Setting									
Element	Defect Type	Quantity coefficient		No. of Rule							
		Ct	Dt	Ct	Dt						
Common	Abutment	6	Crack	0.43	0.00	101	101				
		7	Spalling / Exposed	0.57	5.00	101	-				
		8	Water Leakage	0.29	5.00	-	-				
		11	Delamination	0.14	-	-	-				
		16	Others	0.00	-	-	-				
		17	Reinforcing Material	0.57	-	-	-				
		19	Discoloration of Materials	0.14	-	-	-				
		20	Water Leakage	0.14	-	-	-				
		23	Deformation	0.14	-	-	-				
		Common	Bridge Approach	13	Difference in Level	0.00	-	-	-		
				14	Abnormal Pavement	0.00	-	-	-		
				16	Others	0.00	-	-	-		
				24	Debris	0.00	-	-	-		
		Concrete Girder	Cross beam	6	Crack	0.40	2.00	201	203		
				7	Spalling / Exposed	0.80	0.01	201	-		
				8	Water Leakage	0.40	-	-	-		
				11	Delamination	0.20	-	-	-		
				16	Others	0.00	-	-	-		
				17	Reinforcing Material	0.40	-	-	-		
				18	Abnormal Anchorage	0.80	-	-	-		
				19	Discoloration of Materials	0.05	-	-	-		
				23	Deformation	0.05	-	-	-		
		Common	Curb	6	Crack	0.00	-	-	-		
7	Spalling / Exposed			0.00	-	-	-				
8	Water Leakage			0.00	-	-	-				
11	Delamination			0.00	-	-	-				
16	Others			0.00	-	-	-				
18	Abnormal Anchorage			0.00	-	-	-				
23	Deformation			0.00	-	-	-				
Common	Deck Slab (concrete)			7	Spalling / Exposed	0.10	0.05	202	-		
				8	Water Leakage	0.10	-	-	-		
		9	Fallen out of Deck	1.00	-	-	201				
		10	Crack of Deck	0.75	2.00	202	202				
		11	Delamination	0.03	-	-	-				
		16	Others	0.00	-	-	-				
		17	Reinforcing Material	0.25	-	-	-				
		18	Abnormal Anchorage	0.25	-	-	-				
		19	Discoloration of Materials	0.03	-	-	-				
Common	Drainage System	1	Corrosion	0.00	-	-	-				
		4	Fracture	0.00	-	-	-				
		5	Deterioration of Paint	0.00	-	-	-				
		16	Others	0.00	-	-	-				
		19	Discoloration of Materials	0.00	-	-	-				
		20	Water Leakage	0.00	-	-	-				
		23	Deformation	0.00	-	-	-				
		24	Debris	0.00	-	-	-				
		Common	Exp. Joints (Rubber)	12	Abnormal Spacing	0.00	1.00	103	103		
13	Difference in Level			0.00	1.00	103	103				
16	Others			0.00	-	-	-				
20	Water Leakage			0.00	1.00	103	103				
21	Noise / Vibration			0.00	1.00	103	103				
23	Deformation			0.00	1.00	103	103				
24	Debris			0.00	-	-	-				
Common	Exp. Joints (Steel)			1	Corrosion	0.00	1.00	103	103		
				2	Crack in Steel	0.00	-	-	-		
		3	Loose Bolts	0.00	-	-	-				
		4	Fracture	0.00	1.00	103	103				
		5	Deterioration of Paint	0.00	-	-	-				
		12	Abnormal Spacing	0.00	1.00	103	103				
		13	Difference in Level	0.00	1.00	103	103				
		16	Others	0.00	-	-	-				
		20	Water Leakage	0.00	-	-	-				
		21	Noise / Vibration	0.00	1.00	103	103				
		23	Deformation	0.00	1.00	103	103				
		24	Debris	0.00	-	-	-				
		Common	Foundation	16	Others	0.00	150	101	101		
				25	Settlement	0.25	150	150	101		
				26	Securing	1.00	150	150	101		
				23	Deformation	0.00	-	-	-		
		Common	Inspection Facility	1	Corrosion	0.00	-	-	-		
				2	Crack in Steel	0.00	-	-	-		
				3	Loose Bolts	0.00	-	-	-		
				4	Fracture	0.00	-	-	-		
				5	Deterioration of Paint	0.00	-	-	-		
				16	Others	0.00	-	-	-		
				20	Water Leakage	0.00	-	-	-		
21	Noise / Vibration			0.00	-	-	-				
23	Deformation			0.00	-	-	-				
Common	Lighting facility			1	Corrosion	0.00	-	-	-		
				2	Crack in Steel	0.00	-	-	-		
				3	Loose Bolts	0.00	-	-	-		
				4	Fracture	0.00	-	-	-		
				5	Deterioration of Paint	0.00	-	-	-		
				16	Others	0.00	-	-	-		
				19	Discoloration of Materials	0.00	-	-	-		
				23	Deformation	0.00	-	-	-		
				Concrete Girder	Main Girder	6	Crack	0.33	2.00	205	205
						7	Spalling / Exposed	0.87	0.05	204	-
						8	Water Leakage	0.17	-	-	-
						11	Delamination	0.17	-	-	-
						12	Abnormal Spacing	0.17	-	-	-
						16	Others	0.00	-	-	-
		17	Reinforcing Material			0.30	-	-	-		
		18	Abnormal Anchorage			0.87	0.16	101	-		
		19	Discoloration of Materials			0.03	-	-	-		
		21	Noise / Vibration			0.50	-	-	-		
		22	Abnormal Deflection			0.30	-	-	-		
		23	Deformation			0.03	-	-	-		
		Common	Pavement			15	Disorder of Bearing	0.75	1.00	101	101
						6	Crack	0.33	-	-	-
						7	Spalling / Exposed	0.87	-	-	-
8	Water Leakage					0.17	-	-	-		
11	Delamination					0.17	-	-	-		
15	Disorder of Bearing					0.75	1.00	101	101		
13	Difference in Level					0.00	-	-	-		
14	Abnormal Pavement					0.00	1.00	104	-		
16	Others					0.00	-	-	-		
Common	Pier	6	Crack			0.43	10.00	101	101		
		7	Spalling / Exposed			0.57	10.00	101	-		
		8	Water Leakage	0.29	-	-	-				
		11	Delamination	0.14	-	-	-				
		16	Others	0.00	-	-	-				
		17	Reinforcing Material	0.57	-	-	-				
		19	Discoloration of Materials	0.14	-	-	-				
		20	Water Leakage	0.14	-	-	-				
		23	Deformation	0.14	-	-	-				

Common	Railing (concrete)	6	Crack	0.00				
		7	Spalling / Exposed	0.00				
		8	Water Leakage	0.00				
		11	Delamination	0.00				
		16	Others	0.00				
23	Abnormal Anchorage	0.00						
			Deformation	0.00		1.00	102	
Common	Railing (steel)	1	Corrosion	0.00				
		2	Crack in Steel	0.00				
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00				
16	Others	0.00						
23	Deformation	0.00				1.00	102	
Common	Retaining wall	6	Crack	0.00	5.00	5.00	101	101
		7	Spalling / Exposed	0.00	5.00	5.00	101	101
		8	Water Leakage	0.00				
		11	Delamination	0.00				
		16	Others	0.00				
17	Reinforcing Material	0.00						
19	Discoloration of Materials	0.00						
23	Deformation	0.00						
25	Settlement	0.00	5.00	5.00	101	101		
26	Scouring	0.00	5.00	5.00	101	101		
Common	Road Sign	1	Corrosion	0.00				
		2	Crack in Steel	0.00				
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00				
16	Others	0.00						
19	Discoloration of Materials	0.00						
23	Deformation	0.00						
Common	Utility Pipe	1	Corrosion	0.00				
		2	Crack in Steel	0.00				
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00				
16	Others	0.00						
19	Discoloration of Materials	0.00						
23	Deformation	0.00						
Common	Wheel Guard	6	Crack	0.00				
		7	Spalling / Exposed	0.00				
		8	Water Leakage	0.00				
		11	Delamination	0.00				
		16	Others	0.00				
18	Abnormal Anchorage	0.00						
23	Deformation	0.00						

Bridge Type : Steel Arch Bridge		BMS Defects Coefficient Setting								
Element	Defect Type	Defect Coefficient	Quantity coefficient		No. of Rule					
			Ct	Dt	Ct	Dt				
Common	Abutment	6 Crack	5.00	5.00	101	101				
		7 Spalling / Exposed	5.00	5.00	101	101				
		8 Water Leakage								
		11 Delamination								
		16 Others								
		17 Reinforcing Material	0.57							
		19 Discoloration of Materials	0.14							
		20 Water Leakage	0.14							
		23 Deformation	0.14							
		Common	Bearing (rubber)	1 Corrosion	1.00	1.00	101	101		
				2 Crack in Steel		1.00		101		
				3 Loose Bolts	0.50					
				4 Fracture	1.00	1.00		101		
				5 Deterioration of Paint	0.25					
				15 Disorder of Bearing	1.00					
				16 Others	0.00					
				20 Water Leakage	0.25					
				23 Deformation	0.13					
				24 Debris	0.13					
				25 Settlement	0.88					
				Common	Bearing (steel)	1 Corrosion	1.00	1.00	101	101
						2 Crack in Steel		1.00		101
						3 Loose Bolts	0.50			
4 Fracture	1.00					1.00		101		
5 Deterioration of Paint	0.25									
15 Disorder of Bearing	0.75									
16 Others	0.00									
20 Water Leakage	0.25									
23 Deformation	0.25									
24 Debris	0.25									
25 Settlement	0.50									
Common	Bearing seat					6 Crack		0.25		101
		11 Delamination	0.25			0.25	101	101		
		16 Others	0.00							
		23 Deformation	1.00			0.25	101	101		
		13 Difference in Level	0.00							
		14 Abnormal Pavement	0.00							
Common	Bridge Approach	16 Others	0.00							
		24 Debris	0.00							
		13 Difference in Level	0.00							
		14 Abnormal Pavement	0.00							
Portable Steel Truss Steel Arch	Cross beam	1 Corrosion	3.00			3.00	101	101		
		2 Crack in Steel	1.00			1.00	101	101		
		3 Loose Bolts	0.17							
		4 Fracture	1.00	1.00		101				
		5 Deterioration of Paint	0.17	1.40	201					
		16 Others	0.00							
		21 Noise / Vibration	0.53							
23 Deformation	0.17									
Common	Curb	6 Crack	0.00							
		7 Spalling / Exposed	0.00							
		8 Water Leakage	0.00							
		11 Delamination	0.00							
		16 Others	0.00							
		18 Abnormal Anchorage	0.00							
		23 Deformation	0.00							

Common	Deck Slab (steel)	1 Corrosion	0.50	1.50	201	201				
		2 Crack in Steel	1.00	1.00	201	201				
		3 Loose Bolts	0.17							
		4 Fracture	1.00	1.00		201				
		5 Deterioration of Paint	0.17							
		16 Others	0.00							
		21 Noise / Vibration	0.17							
		23 Deformation	0.17							
		Common	Deck Slab (concrete)	7 Spalling / Exposed	0.10	0.05	202			
				8 Water Leakage	0.10					
				9 Fallen out of Deck	1.00	1.00		201		
				10 Crack of Deck	0.75	2.00	202	202		
				11 Delamination	0.03					
				16 Others	0.00					
				17 Reinforcing Material	0.25					
				18 Abnormal Anchorage	0.25					
				19 Discoloration of Materials	0.03					
				Common	Drainage System	1 Corrosion	0.00			
						4 Fracture	0.00			
						5 Deterioration of Paint	0.00			
						16 Others	0.00			
						19 Discoloration of Materials	0.00			
						20 Water Leakage	0.00			
23 Deformation	0.00									
24 Debris	0.00									
Common	Exp. Joints (Rubber)					12 Abnormal Spacing	0.00	1.00	103	103
						13 Difference in Level	0.00	1.00	103	103
						16 Others	0.00			
						20 Water Leakage	0.00	1.00	103	103
						21 Noise / Vibration	0.00			
						23 Deformation	0.00	1.00	103	103
		24 Debris	0.00							
		Common	Exp. Joints (Steel)			1 Corrosion	0.00	1.00	103	103
						2 Crack in Steel	0.00			
						3 Loose Bolts	0.00			
						4 Fracture	0.00	1.00	103	103
						5 Deterioration of Paint	0.00			
						12 Abnormal Spacing	0.00	1.00	103	103
						13 Difference in Level	0.00			
						16 Others	0.00			
				20 Water Leakage	0.00					
				21 Noise / Vibration	0.00					
				23 Deformation	0.00	1.00	103	103		
				24 Debris	0.00					
				Common	Foundation	16 Others	0.00			
						25 Settlement	0.25	150	101	101
						26 Scouring	1.00	150	101	101
Common	Inspection Facility			1 Corrosion	0.00					
				2 Crack in Steel	0.00					
				3 Loose Bolts	0.00					
				4 Fracture	0.00					
				5 Deterioration of Paint	0.00					
		16 Others	0.00							
		20 Water Leakage	0.00							
		21 Noise / Vibration	0.00							
		23 Deformation	0.00							

Common	Retaining wall	6	Crack	0.00	5.00	5.00	101	101
		7	Spalling / Exposed	0.00	5.00	5.00	101	101
		8	Water Leakage	0.00				
		11	Delamination	0.00				
		16	Others	0.00				
		17	Reinforcing Material	0.00				
		19	Discoloration of Materials	0.00				
		23	Deformation	0.00	5.00	5.00	101	101
Common	Road Sign	1	Corrosion	0.00				
		2	Crack in Steel	0.00				
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00				
		16	Others	0.00				
		19	Discoloration of Materials	0.00				
		23	Deformation	0.00	5.00	5.00	101	101
Portable Steel Truss Steel Arch	Stringer	1	Corrosion	0.00	0.70	0.70	102	102
		2	Crack in Steel	0.00	1.00	1.00	101	101
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00				
		16	Others	0.00	0.70	0.70	102	102
		17	Reinforcing Material	0.00				
		23	Deformation	0.00				
Common	Utility Pipe	1	Corrosion	0.00				
		2	Crack in Steel	0.00				
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00				
		16	Others	0.00				
		19	Discoloration of Materials	0.00				
		23	Deformation	0.00				
Common	Wheel Guard	6	Crack	0.00				
		7	Spalling / Exposed	0.00				
		8	Water Leakage	0.00				
		11	Delamination	0.00				
		16	Others	0.00				
		18	Abnormal Anchorage	0.00				
		23	Deformation	0.00				

Steel	Lateral Bracing	1	Corrosion	0.00	3.00	3.00	201	201
		2	Crack in Steel	0.00	1.00	1.00	101	101
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00	0.40	0.40	102	102
		16	Others	0.00				
		17	Reinforcing Material	0.00				
		23	Deformation	0.00				
Common	Lighting facility	1	Corrosion	0.00				
		2	Crack in Steel	0.00				
		3	Loose Bolts	0.00				
		4	Fracture	0.00				
		5	Deterioration of Paint	0.00				
		16	Others	0.00				
		19	Discoloration of Materials	0.00				
		23	Deformation	0.00				
Steel Arch	Main Arch	1	Corrosion	0.80	3.00	3.00	209	209
		2	Crack in Steel	1.00	1.00	1.00	101	101
		3	Loose Bolts	0.20				
		4	Fracture	1.00				
		5	Deterioration of Paint	0.20	1.00	1.00	206	206
		12	Abnormal Spacing	0.20				
		16	Others	0.00				
		23	Deformation	0.20				
Common	Pavement	6	Disorder of Bearing	0.75	1.00	1.00	101	101
		7	Spalling / Exposed	0.87				
		8	Water Leakage	0.17				
		11	Delamination	0.17				
		15	Disorder of Bearing	0.75	1.00	1.00	101	101
		18	Difference in Level	0.00				
		14	Abnormal Pavement	0.00	1.00	1.00	104	104
		24	Debris	0.00				
Common	Pier	6	Crack	0.43	10.00	10.00	101	101
		7	Spalling / Exposed	0.57	10.00	10.00	101	101
		8	Water Leakage	0.29				
		11	Delamination	0.14				
		16	Others	0.00				
		17	Reinforcing Material	0.57				
		19	Discoloration of Materials	0.14				
		23	Deformation	0.14				
Common	Railing (concrete)	6	Crack	0.00				
		7	Spalling / Exposed	0.00				
		8	Water Leakage	0.00				
		11	Delamination	0.00				
		16	Others	0.00				
		18	Abnormal Anchorage	0.00				
		23	Deformation	0.00				
		Common	Railing (steel)	1	Corrosion	0.00		
2	Crack in Steel			0.00				
3	Loose Bolts			0.00				
4	Fracture			0.00				
5	Deterioration of Paint			0.00				
16	Others			0.00				
23	Deformation			0.00				
102					1.00	1.00	102	102

Bridge Type : Steel Box Girder Bridge	Element	BMS Defects Coefficient Setting				Defect Type	Defect Coefficient	Quantity coefficient				No. of Rule			
		Ct	Dt	Ct	Dt			Ct	Dt	Ct	Dt				
Common	Abutment	6	Crack	0.43	1.00	5.00	5.00	101	101	101	101	201	201		
		7	Spalling / Exposed	0.57	1.00	5.00	5.00	101	101	101	101	201	201		
		8	Water Leakage	0.29	1.00							202	202		
		11	Delamination	0.14											
		16	Others	0.00											
		17	Reinforcing Material	0.57											
		19	Discoloration of Materials	0.14											
		20	Water Leakage	0.14											
		23	Deformation	0.14											
Common		Bearing (rubber)	1	Corrosion	0.25	1.00	1.00	1.00	101	101	101	101	202	202	
			2	Crack in Steel	1.00	1.00									
			3	Loose Bolts	0.50	1.00									
			4	Fracture	1.00	1.00									
			5	Deterioration of Paint	0.25	1.00									
			15	Disorder of Bearing	1.00	1.00									
			16	Others	0.00										
			20	Water Leakage	0.25										
			23	Deformation	0.13										
			24	Debris	0.13										
	25		Settlement	0.88											
Common	Bearing (steel)		1	Corrosion	0.25	1.00	1.00	1.00	101	101	101	103	103		
			2	Crack in Steel	1.00	1.00									
			3	Loose Bolts	0.50	1.00									
			4	Fracture	1.00	1.00									
			5	Deterioration of Paint	0.25	1.00									
			15	Disorder of Bearing	0.75	1.00									
			16	Others	0.00										
			20	Water Leakage	0.25										
		23	Deformation	0.25											
		24	Debris	0.25											
		25	Settlement	0.50											
Common		Beating seat	6	Crack	0.14	0.25	0.25	0.25							
			11	Delamination	0.29	0.25									
			16	Others	0.00										
			23	Deformation	1.00	0.25									
Common			Bridge Approach	13	Difference in Level	0.00									
				14	Abnormal Pavement	0.00									
				16	Others	0.00									
				24	Debris	0.00									
Steel Girder	Cross beam			1	Corrosion	0.33	1.50	1.50	1.50	203	203	203	101	101	
				2	Crack in Steel	1.00	1.00								
			3	Loose Bolts	0.17	1.00									
			4	Fracture	1.00	1.00									
			5	Deterioration of Paint	0.17	1.50									
			16	Others	0.00										
			21	Noise / Vibration	0.53										
			23	Deformation	0.17										
Common			Curb	6	Crack	0.00									
				7	Spalling / Exposed	0.00									
				8	Water Leakage	0.00									
		11		Delamination	0.00										
		16		Others	0.00										
		18		Abnormal Anchorage	0.00										
		23		Deformation	0.00										
Common		Deck Slab (steel)		1	Corrosion	0.50	1.50	1.50	1.50	101	101	101	103	103	
				2	Crack in Steel	1.00	1.00								
				3	Loose Bolts	0.17	1.00								
				4	Fracture	1.00	1.00								
	5			Deterioration of Paint	0.17	1.00									
	16			Others	0.00										
	21			Noise / Vibration	0.17										
	23			Deformation	0.17										
Common	Deck Slab (concrete)			7	Spalling / Exposed	0.10	0.05	0.05	0.05	101	101	101	202	202	
				8	Water Leakage	0.10									
				9	Fallen out of Deck	1.00	1.00								
				10	Crack of Deck	0.75	2.00								
			11	Delamination	0.03										
			16	Others	0.00										
			17	Reinforcing Material	0.25										
			18	Abnormal Anchorage	0.25										
			19	Discoloration of Materials	0.03										
Common			Drainage System	1	Corrosion	0.00									
				4	Fracture	0.00									
		5		Deterioration of Paint	0.00										
		16		Others	0.00										
		19		Discoloration of Materials	0.00										
		20		Water Leakage	0.00										
		23		Deformation	0.00										
		24		Debris	0.00										
Common		Exp. Joints (Rubber)		12	Abnormal Spacing	0.00	1.00	1.00	1.00	103	103	103	103	103	
				13	Difference in Level	0.00	1.00								
	16			Others	0.00										
	20			Water Leakage	0.00	1.00									
	21			Noise / Vibration	0.00	1.00									
	23			Deformation	0.00	1.00									
	24			Debris	0.00	1.00									
Common	Exp. Joints (Steel)			1	Corrosion	0.00	1.00	1.00	1.00	103	103	103	103	103	
				2	Crack in Steel	0.00									
				3	Loose Bolts	0.00									
				4	Fracture	0.00	1.00								
			5	Deterioration of Paint	0.00	1.00									
			12	Abnormal Spacing	0.00	1.00									
			13	Difference in Level	0.00	1.00									
			16	Others	0.00										
			20	Water Leakage	0.00										
			21	Noise / Vibration	0.00										
			23	Deformation	0.00	1.00									
			24	Debris	0.00	1.00									
Common		Foundation	16	Others	0.00	150	150	150	101	101	101	101	101		
			25	Settlement	0.25	150									
			26	Scouring	1.00	150									
Common			Inspection Facility	1	Corrosion	0.00									
				2	Crack in Steel	0.00									
				3	Loose Bolts	0.00									
		4		Fracture	0.00										
	5	Deterioration of Paint		0.00											
	16	Others		0.00											
	20	Water Leakage		0.00											
	21	Noise / Vibration		0.00											
	23	Deformation		0.00											

Common	Retaining wall	6 Crack	0.00	5.00	5.00	101	101	101
		7 Spalling / Exposed	0.00	5.00	5.00	101	101	101
		8 Water Leakage	0.00					
		11 Delamination	0.00					
		16 Others	0.00					
		17 Reinforcing Material	0.00					
		19 Discoloration of Materials	0.00					
		23 Deformation	0.00					
		25 Settlement	0.00	5.00	5.00	101	101	101
		26 Scouring	0.00	5.00	5.00	101	101	101
Common	Road Sign	1 Corrosion	0.00					
		2 Crack in Steel	0.00					
		3 Loose Bolts	0.00					
		4 Fracture	0.00					
		5 Deterioration of Paint	0.00					
		16 Others	0.00					
		19 Discoloration of Materials	0.00					
		23 Deformation	0.00					
Steel Girder	Stringer	1 Corrosion	0.00	0.70	0.70	102	102	102
		2 Crack in Steel	0.00	1.00	1.00	101	101	101
		3 Loose Bolts	0.00					
		4 Fracture	0.00					
		5 Deterioration of Paint	0.00	–	–	–	–	101
		16 Others	0.00	0.70	–	102	–	–
		17 Reinforcing Material	0.00					
		21 Noise / Vibration	0.00					
		22 Abnormal Deflection	0.00					
		23 Deformation	0.00					
Common	Utility Pipe	1 Corrosion	0.00					
		2 Crack in Steel	0.00					
		3 Loose Bolts	0.00					
		4 Fracture	0.00					
		5 Deterioration of Paint	0.00					
		16 Others	0.00					
		19 Discoloration of Materials	0.00					
		23 Deformation	0.00					
Common	Wheel Guard	6 Crack	0.00					
		7 Spalling / Exposed	0.00					
		8 Water Leakage	0.00					
		11 Delamination	0.00					
		16 Others	0.00					
		18 Abnormal Anchorage	0.00					
		23 Deformation	0.00					

Steel	Lateral Bracing	1 Corrosion	0.00	3.00	3.00	201	201	201
		2 Crack in Steel	0.00	1.00	1.00	101	101	101
		3 Loose Bolts	0.00					
		4 Fracture	0.00	–	1.00	–	101	–
		5 Deterioration of Paint	0.00	0.40	–	102	–	–
		16 Others	0.00					
		17 Reinforcing Material	0.00					
		23 Deformation	0.00					
Common	Lighting facility	1 Corrosion	0.00					
		2 Crack in Steel	0.00					
		3 Loose Bolts	0.00					
		4 Fracture	0.00					
		5 Deterioration of Paint	0.00					
		16 Others	0.00					
		19 Discoloration of Materials	0.00					
		23 Deformation	0.00					
Steel Box	Main Girder	1 Corrosion	0.80	3.00	3.00	209	209	209
		2 Crack in Steel	1.00	1.00	1.00	101	101	101
		3 Loose Bolts	0.20					
		4 Fracture	1.00	–	1.00	–	101	–
		5 Deterioration of Paint	0.20	1.00	–	206	–	–
		12 Abnormal Spacing	0.20					
		16 Others	0.00					
		17 Reinforcing Material	0.20					
		20 Water Leakage	0.20					
		21 Noise / Vibration	0.20					
		22 Abnormal Deflection	0.20					
		23 Deformation	0.20					
Common	Pavement	15 Disorder of Bearing	0.75	1.00	1.00	101	101	101
		6 Crack	0.33					
		7 Spalling / Exposed	0.87					
		8 Water Leakage	0.17					
		11 Delamination	0.17					
		15 Disorder of Bearing	0.75	1.00	1.00	101	101	101
		13 Difference in Level	0.00					
		14 Abnormal Pavement	0.00	1.00	–	104	–	–
		16 Others	0.00					
		24 Debris	0.00					
Common	Pier	6 Crack	0.43	10.00	10.00	101	101	101
		7 Spalling / Exposed	0.57	10.00	–	101	–	–
		8 Water Leakage	0.29					
		11 Delamination	0.14					
		16 Others	0.00					
		17 Reinforcing Material	0.57					
		19 Discoloration of Materials	0.14					
		20 Water Leakage	0.14					
		23 Deformation	0.14					
Common	Railing (concrete)	6 Crack	0.00					
		7 Spalling / Exposed	0.00					
		8 Water Leakage	0.00					
		11 Delamination	0.00					
		16 Others	0.00					
		18 Abnormal Anchorage	0.00					
		23 Deformation	0.00	–	1.00	–	102	–
Common	Railing (steel)	1 Corrosion	0.00					
		2 Crack in Steel	0.00					
		3 Loose Bolts	0.00					
		4 Fracture	0.00					
		5 Deterioration of Paint	0.00					
		16 Others	0.00					
		23 Deformation	0.00	–	1.00	–	102	–

Bridge Type : Steel Girder Bridge		BMS Defects Coefficient Setting								
Element	Defect Type	Defect Coefficient	Quantity coefficient		No. of Rule					
			Ct	Dt	Ct	Dt				
Common	Abutment	6 Crack	5.00	5.00	101	101				
		7 Spalling / Exposed	5.00	5.00	101	101				
		8 Water Leakage								
		11 Delamination								
		16 Others								
		17 Reinforcing Material								
		19 Discoloration of Materials								
		20 Water Leakage								
		23 Deformation								
		23 Deformation								
		Common	Bearing (rubber)	1 Corrosion	1.00	1.00	101	101		
				2 Crack in Steel						
				3 Loose Bolts						
				4 Fracture						
				5 Deterioration of Paint						
				15 Disorder of Bearing						
				16 Others						
				20 Water Leakage						
				23 Deformation						
				24 Debris						
				25 Settlement						
				Common	Bearing (steel)	1 Corrosion	1.00	1.00	101	101
						2 Crack in Steel				
3 Loose Bolts										
4 Fracture										
5 Deterioration of Paint										
15 Disorder of Bearing										
16 Others										
20 Water Leakage										
23 Deformation										
24 Debris										
25 Settlement										
Common	Bearing seat					6 Crack		0.25		101
		11 Delamination	0.25			0.25	101	101		
		16 Others								
		23 Deformation	0.25			0.25	101	101		
		13 Difference in Level								
		14 Abnormal Pavement								
Common	Bridge Approach	13 Difference in Level								
		14 Abnormal Pavement								
		16 Others								
		24 Debris								
Steel Girder	Cross beam	1 Corrosion	1.50			1.50	203	203		
		2 Crack in Steel	1.00			1.00	101	101		
		3 Loose Bolts								
		4 Fracture								
		5 Deterioration of Paint	1.50	1.50	203	203				
		16 Others								
		21 Noise / Vibration	0.53	0.53						
23 Deformation	0.17	0.17								
Common	Curb	6 Crack								
		7 Spalling / Exposed								
		8 Water Leakage								
		11 Delamination								
		16 Others								
		18 Abnormal Anchorage								
		23 Deformation								
		23 Deformation								

Common	Deck Slab (steel)	1 Corrosion	0.50	0.50	1.50	1.50	201	201				
		2 Crack in Steel	1.00	1.00	1.00	1.00	201	201				
		3 Loose Bolts	0.17	0.17								
		4 Fracture	1.00	1.00								
		5 Deterioration of Paint	0.17	0.17								
		16 Others	0.00	0.00								
		21 Noise / Vibration	0.17	0.17								
		23 Deformation	0.17	0.17								
		Common	Deck Slab (concrete)	7 Spalling / Exposed	0.10	0.10	0.05	0.05	202	202		
				8 Water Leakage	0.10	0.10						
				9 Fallen out of Deck	1.00	1.00						
				10 Crack of Deck	0.75	0.75	2.00	2.00	202	202		
				11 Delamination	0.03	0.03						
				16 Others	0.00	0.00						
				17 Reinforcing Material	0.25	0.25						
				18 Abnormal Anchorage	0.25	0.25						
				19 Discoloration of Materials	0.03	0.03						
				Common	Drainage System	1 Corrosion	0.00	0.00				
						4 Fracture	0.00	0.00				
						5 Deterioration of Paint	0.00	0.00				
						16 Others	0.00	0.00				
						19 Discoloration of Materials	0.00	0.00				
						20 Water Leakage	0.00	0.00				
23 Deformation	0.00					0.00						
24 Debris	0.00					0.00						
Common	Exp. Joints (Rubber)					12 Abnormal Spacing	0.00	0.00	1.00	1.00	103	103
						13 Difference in Level	0.00	0.00	1.00	1.00	103	103
						16 Others	0.00	0.00				
						20 Water Leakage	0.00	0.00	1.00	1.00	103	103
						21 Noise / Vibration	0.00	0.00				
						23 Deformation	0.00	0.00	1.00	1.00	103	103
		24 Debris	0.00			0.00						
		Common	Exp. Joints (Steel)			1 Corrosion	0.00	0.00	1.00	1.00	103	103
						2 Crack in Steel	0.00	0.00				
						3 Loose Bolts	0.00	0.00				
						4 Fracture	0.00	0.00	1.00	1.00	103	103
						5 Deterioration of Paint	0.00	0.00				
						12 Abnormal Spacing	0.00	0.00	1.00	1.00	103	103
						13 Difference in Level	0.00	0.00				
						16 Others	0.00	0.00				
				20 Water Leakage	0.00	0.00						
				21 Noise / Vibration	0.00	0.00						
				23 Deformation	0.00	0.00	1.00	1.00	103	103		
				24 Debris	0.00	0.00						
				Common	Foundation	16 Others	0.00	0.00				
						25 Settlement	0.25	0.25	150	150	101	101
						26 Scouring	1.00	1.00	150	150	101	101
						Common	Inspection Facility	1 Corrosion	0.00	0.00		
2 Crack in Steel	0.00							0.00				
3 Loose Bolts	0.00							0.00				
4 Fracture	0.00			0.00								
5 Deterioration of Paint	0.00			0.00								
16 Others	0.00			0.00								
20 Water Leakage	0.00			0.00								
21 Noise / Vibration	0.00			0.00								
23 Deformation	0.00	0.00										

Bridge Type : Truss Bridge		Element		Defect Type		Defect Coefficient		Quantity coefficient		No. of Rule						
Common	Element	Defect Type	Defect Coefficient	Ct	Dt	Ct	Dt	Ct	Dt	Ct	Dt					
Common	Abutment	6	Crack	0.43	5.00	5.00	5.00	101	101	101	101					
		7	Spalling / Exposed	0.57	5.00	5.00	5.00	101	101	101	101					
		8	Water Leakage	0.29												
		11	Delamination	0.14												
		16	Others	0.00												
		17	Reinforcing Material	0.57												
		19	Discoloration of Materials	0.14												
		20	Water Leakage	0.14												
		23	Deformation	0.14												
		Common	Bearing (rubber)	1	Corrosion	0.25	1.00	1.00	1.00	101	101	101	101			
				2	Crack in Steel	1.00										
				3	Loose Bolts	0.50										
				4	Fracture	1.00										
				5	Deterioration of Paint	0.25										
				15	Disorder of Bearing	1.00										
				16	Others	0.00										
				20	Water Leakage	0.25										
				23	Deformation	0.13										
				24	Debris	0.13										
				25	Settlement	0.88										
				Common	Bearing (steel)	1	Corrosion	0.25	1.00	1.00	1.00	101	101	101	101	
						2	Crack in Steel	1.00								
						3	Loose Bolts	0.50								
4	Fracture					1.00										
5	Deterioration of Paint					0.25										
15	Disorder of Bearing					0.75										
16	Others					0.00										
20	Water Leakage					0.25										
23	Deformation					0.25										
24	Debris					0.25										
25	Settlement					0.50										
Common	Bearing seat					6	Crack	0.14								
						11	Delamination	0.29								
						16	Others	0.00								
		23	Deformation			1.00										
Common	Bridge Approach	13	Difference in Level			0.00										
		14	Abnormal Pavement			0.00										
		16	Others			0.00										
		24	Debris			0.00										
Portable Steel Truss Steel Arch	Cross beam	1	Corrosion			0.33	3.00	3.00	3.00	101	101	101	101			
		2	Crack in Steel			1.00										
		3	Loose Bolts			0.17										
		4	Fracture			1.00										
		5	Deterioration of Paint	0.17												
Common	Curb	6	Crack	0.00												
		7	Spalling / Exposed	0.00												
		8	Water Leakage	0.00												

Common	Retaining wall	6	Crack	0.00	5.00	5.00	5.00	101	101	101	101				
		7	Spalling / Exposed	0.00	5.00	5.00	5.00	101	101	101	101				
		8	Water Leakage	0.00											
		11	Delamination	0.00											
		16	Others	0.00											
		17	Reinforcing Material	0.00											
		19	Discoloration of Materials	0.00											
		23	Deformation	0.00											
		25	Settlement	0.00											
		26	Scouring	0.00	5.00	5.00	5.00	101	101	101	101	101			
		Common	Road Sign	1	Corrosion	0.00									
				2	Crack in Steel	0.00									
				3	Loose Bolts	0.00									
				4	Fracture	0.00									
				5	Deterioration of Paint	0.00									
				16	Others	0.00									
				19	Discoloration of Materials	0.00									
				23	Deformation	0.00									
				Steel Girder	Stringer	1	Corrosion	0.00	0.70	0.70	0.70	102	102	102	102
						2	Crack in Steel	0.00	1.00	1.00	1.00	101	101	101	101
						3	Loose Bolts	0.00							
						4	Fracture	0.00							
						5	Deterioration of Paint	0.00							
16	Others					0.00	0.70	0.70	0.70	102	102	102	102		
17	Reinforcing Material					0.00									
21	Noise / Vibration					0.00									
22	Abnormal Deflection					0.00									
23	Deformation					0.00									
Common	Utility Pipe					1	Corrosion	0.00							
						2	Crack in Steel	0.00							
						3	Loose Bolts	0.00							
						4	Fracture	0.00							
						5	Deterioration of Paint	0.00							
		16	Others			0.00									
		19	Discoloration of Materials			0.00									
		23	Deformation			0.00									
		Common	Wheel Guard			6	Crack	0.00							
						7	Spalling / Exposed	0.00							
						8	Water Leakage	0.00							
						11	Delamination	0.00							
						16	Others	0.00							
				18	Abnormal Anchorage	0.00									

Portable Steel Truss Steel Arch	Lateral Bracing																							1	Corrosion	0.00	3.00	3.00	201	201			
	2	Crack in Steel	0.00	1.00	1.00	101	101																										
	3	Loose Bolts	0.00																														
	4	Fracture	0.00																														
	5	Deterioration of Paint	0.00																														
	16	Others	0.00	0.40																													
	17	Reinforcing Material	0.00																														
	23	Deformation	0.00																														
	Common	Lighting facility																							1	Corrosion	0.00						
		2	Crack in Steel	0.00																													
		3	Loose Bolts	0.00																													
		4	Fracture	0.00																													
		5	Deterioration of Paint	0.00																													
		16	Others	0.00																													
		19	Discoloration of Materials	0.00																													
		23	Deformation	0.00																													
		Portable Steel Truss	Main Truss																							15	Disorder of Bearing	0.75	1.00	1.00	101	101	
			6	Crack	0.33																												
			7	Spalling / Exposed	0.87																												
			8	Water Leakage	0.17																												
			11	Delamination	0.17																												
			15	Disorder of Bearing	0.75	1.00	1.00	101	101																								
			1	Corrosion	0.80	3.00	3.00	101	101																								
2			Crack in Steel	1.00	1.00	1.00	101	101																									
3			Loose Bolts	0.20																													
4			Fracture	1.00																													
5			Deterioration of Paint	0.20	1.00	1.00	208	208																									
12			Abnormal Spacing	0.20																													
16			Others	0.00																													
17			Reinforcing Material	0.20																													
20			Water Leakage	0.20																													
21	Noise / Vibration		0.20																														
22	Abnormal Deflection		0.20																														
23	Deformation		0.20																														
Common	Pavement																							13	Difference in Level	0.00							
	14		Abnormal Pavement	0.00	1.00	1.00	104	104																									
	16		Others	0.00																													
	24		Debris	0.00																													
	Common		Pier																							6	Crack	0.43	10.00	10.00	101	101	
		7	Spalling / Exposed	0.57	10.00	10.00	101	101																									
		8	Water Leakage	0.29																													
		11	Delamination	0.14																													
		16	Others	0.00																													
		17	Reinforcing Material	0.57																													
		19	Discoloration of Materials	0.14																													
		20	Water Leakage	0.14																													
		23	Deformation	0.14																													
		Common	Railing (concrete)																							6	Crack	0.00					
			7	Spalling / Exposed	0.00																												
			8	Water Leakage	0.00																												
			11	Delamination	0.00																												
			16	Others	0.00																												
			18	Abnormal Anchorage	0.00																												
			23	Deformation	0.00																												
			Common	Railing (steel)																							1	Corrosion	0.00				
				2	Crack in Steel	0.00																											
				3	Loose Bolts	0.00																											
4				Fracture	0.00																												
5				Deterioration of Paint	0.00																												
16				Others	0.00																												
23				Deformation	0.00																												

Common	Deck Slab (steel)																							1	Corrosion	0.50	1.50	1.50	201	201		
	2	Crack in Steel	1.00	1.00	1.00	201	201																									
	3	Loose Bolts	0.17																													
	4	Fracture	1.00																													
	5	Deterioration of Paint	0.17																													
	16	Others	0.00																													
	21	Noise / Vibration	0.17																													
	23	Deformation	0.17																													
	Common	Deck Slab (concrete)																							7	Spalling / Exposed	0.10	0.05				
		8	Water Leakage	0.10																												
		9	Fallen out of Deck	1.00																												
		10	Crack of Deck	0.75	1.00	1.00	202	202																								
		11	Delamination	0.03																												
		16	Others	0.00																												
		17	Reinforcing Material	0.25																												
		18	Abnormal Anchorage	0.25																												
		19	Discoloration of Materials	0.03																												
		Common	Drainage System																							1	Corrosion	0.00				
			4	Fracture	0.00																											
			5	Deterioration of Paint	0.00																											
			16	Others	0.00																											
			19	Discoloration of Materials	0.00																											
			20	Water Leakage	0.00																											
23			Deformation	0.00																												
24			Debris	0.00																												
Common			Exp. Joints (Rubber)																							12	Abnormal Spacing	0.00	1.00	1.00	103	103
			13	Difference in Level	0.00	1.00	1.00	103	103																							
			16	Others	0.00																											
			20	Water Leakage	0.00	1.00	1.00	103	103																							
			21	Noise / Vibration	0.00																											
			23	Deformation	0.00	1.00	1.00	103	103																							
	24		Debris	0.00																												
	Common		Exp. Joints (Steel)																							1	Corrosion	0.00	1.00	1.00	103	103
			2	Crack in Steel	0.00																											
			3	Loose Bolts	0.00																											
			4	Fracture	0.00	1.00	1.00	103	103																							
			5	Deterioration of Paint	0.00																											
			12	Abnormal Spacing	0.00																											
			13	Difference in Level	0.00	1.00	1.00	103	103																							
			16	Others	0.00																											
		20	Water Leakage	0.00																												
		21	Noise / Vibration	0.00																												
		23	Deformation	0.00	1.00	1.00	103	103																								
		24	Debris	0.00																												
		Common	Foundation																							16	Others	0.00				
			25	Settlement	0.25	150	150	101	101																							
			26	Scouring	1.00	150	150	101	101																							
			Common	Inspection Facility																							1	Corrosion	0.00			
2				Crack in Steel	0.00																											
3				Loose Bolts	0.00																											
4				Fracture	0.00																											
5				Deterioration of Paint	0.00																											
16				Others	0.00																											
20				Water Leakage	0.00																											
21				Noise / Vibration	0.00																											
23	Deformation			0.00																												

Common	Retaining wall	6	Crack	0.00	5.00	101	101		
		7	Spalling / Exposed	0.00	5.00	101	101		
		8	Water Leakage	0.00					
		11	Delamination	0.00					
		16	Others	0.00					
		17	Reinforcing Material	0.00					
		19	Discoloration of Materials	0.00					
		23	Deformation	0.00					
		25	Settlement	0.00	5.00	101	101		
		26	Scouring	0.00	5.00	5.00	101		
Common	Road Sign	1	Corrosion	0.00					
		2	Crack in Steel	0.00					
		3	Loose Bolts	0.00					
		4	Fracture	0.00					
		5	Deterioration of Paint	0.00					
		16	Others	0.00					
		19	Discoloration of Materials	0.00					
		23	Deformation	0.00					
		Portable Steel Truss Steel Arch	Stringer	1	Corrosion	0.00	0.70	102	102
				2	Crack in Steel	0.00	1.00	1.00	101
3	Loose Bolts			0.00					
4	Fracture			0.00					
5	Deterioration of Paint			0.00					
16	Others			0.00	0.70	1.00	101		
17	Reinforcing Material			0.00					
21	Noise / Vibration			0.00					
22	Abnormal Deflection			0.00					
23	Deformation			0.00					
Common	Utility Pipe	1	Corrosion	0.00					
		2	Crack in Steel	0.00					
		3	Loose Bolts	0.00					
		4	Fracture	0.00					
		5	Deterioration of Paint	0.00					
		16	Others	0.00					
		19	Discoloration of Materials	0.00					
		23	Deformation	0.00					
		Common	Wheel Guard	6	Crack	0.00			
				7	Spalling / Exposed	0.00			
8	Water Leakage			0.00					
11	Delamination			0.00					
16	Others			0.00					
18	Abnormal Anchorage			0.00					
23	Deformation			0.00					

SL	Remedial Measure	Unit	Unit Cost
1	Supplementing Steel Plate	BDT/ m2	75,045
2	Repainting of Steel Member	BDT/ m2	2,323
3	Stop hole+Supplementing Steel Plate	BDT/ m2	75,045
4	Replacement of Steel Member	BDT/ pt	1 (dummy)
5	Crack Injectuon	BDT/ m	5,419
6	Crack Filling	BDT/ m	89
7	Hand Applied Mortar	BDT/ m3	197,579
8	Fluid Recasting Mortar	BDT/ m3	95,793
9	Fluid Recasting Concrete	BDT/ m3	100,036
10	Replacing the Deck Slab	BDT/ m2	24,958,168
11	Carbon Fiber Sheet Bonding on Concrete	BDT/ m2	55,422
12	Repairing of Settlement	BDT/ m3	13,465
13	Reparing of Scouling	BDT/ m3	13,461
14	Reparing of Foundation Consolodation	BDT/ m3	13,461
15	Repainting of Bearing	BDT/ pt	1,578
16	Replacement of Bearing	BDT/ pt	96,979
17	Repairing of Expansion Joint	BDT/ m	10,397
18	Replacement of Expansion Joint	BDT/ m	28,922
19	Replacement of Asphalt Pavement (& Waterproofing)	BDT/ m2	5,880
20	Replacement of Railing	BDT/ m	26,007
21	Replacement of Curb	BDT/ m3	43,930
22	Replacement of Drainage System	BDT/ pt	5,565
23	Scaffoldings for Bridge Rehabilitation / Strengthening	BDT/ m2	20,278

Component	Element Type	Material	Type of Defects	C1 Minor Repair Member	DI Emergency Supplementing Steel Plate
Superstructure	* Primary member	Steel	1. Corrosion	11 : Repainting of Steel Member	14 : Replacement of Steel Member
			2. Crack in Steel	12 : Stop hole+Supplementing Steel M : PMP Minor Repair Method	12 : Stop hole+Supplementing Steel M : PMP Minor Repair Method
			3. Loose or Missing Bolts	14 : Replacement of Steel Member	14 : Replacement of Steel Member
			4. Fracture	11 : Repainting of Steel Member	X : Impossible to Fix a Method
			5. Deterioration of Paint System	11 : Repainting of Steel Member	X : Impossible to Fix a Method
			16. Other Types of Defects	X : Impossible to Fix a Method	X : Impossible to Fix a Method
			17. Defects of Reinforcing material	0 : No Remedy	0 : No Remedy
			21. Abnormal Noise / Vibration	X : Impossible to Fix a Method	X : Impossible to Fix a Method
			23. Deformation / Break	11 : Repainting of Steel Member	10 : Supplementing Steel Plate
			1. Corrosion	11 : Repainting of Steel Member	10 : Supplementing Steel Plate
			2. Crack in Steel	12 : Stop hole+Supplementing Steel M : PMP Minor Repair Method	12 : Stop hole+Supplementing Steel M : PMP Minor Repair Method
			3. Loose or Missing Bolts	X : Impossible to Fix a Method	10 : Supplementing Steel Plate
			4. Fracture	11 : Repainting of Steel Member	X : Impossible to Fix a Method
			5. Deterioration of Paint System	25 : Fluid Recasting Concrete	X : Impossible to Fix a Method
			7. Spalling / Exposed Rebar	0 : No Remedy	X : Impossible to Fix a Method
			8. Water leakage / Efflorescence	- : This category is not exist.	- : This category is not exist.
			9. Fallen out of Deck Slab	21 : Crack Injection	26 : Replacement of Concrete Deck
			10. Crack of Deck Slab	- : This category is not exist.	27 : Carbon Fiber Sheet Bonding on Concrete
			11. Delamination	X : Impossible to Fix a Method	X : Impossible to Fix a Method
			16. Other Types of Defects	X : Impossible to Fix a Method	X : Impossible to Fix a Method
			17. Defects of Reinforcing material	0 : No Remedy	- : This category is not exist.
			18. Abnormal Anchorage	- : This category is not exist.	- : This category is not exist.
			19. Discoloration / Deterioration	0 : No Remedy	- : This category is not exist.
20. Water Leakage / Puddle	X : Impossible to Fix a Method	- : This category is not exist.			
23. Deformation / Break	X : Impossible to Fix a Method	X : Impossible to Fix a Method			

Component	Element Type	Material	Type of Defects	C1 Minor Repair Member	DI Emergency Supplementing Steel Plate
Superstructure	* Primary member	Concrete	1. Corrosion	11 : Repainting of Steel Member	10 : Supplementing Steel Plate
			2. Crack in Steel	12 : Stop hole+Supplementing Steel M : PMP Minor Repair Method	12 : Stop hole+Supplementing Steel M : PMP Minor Repair Method
			3. Loose or Missing Bolts	0 : No Remedy	10 : Supplementing Steel Plate
			4. Fracture	11 : Repainting of Steel Member	X : Impossible to Fix a Method
			5. Deterioration of Paint System	11 : Repainting of Steel Member	X : Impossible to Fix a Method
			6. Crack	22 : Crack Filling	27 : Carbon Fiber Sheet Bonding on Concrete
			7. Spalling / Exposed Rebar	24 : Fluid Recasting Mortar	- : This category is not exist.
			8. Water leakage / Efflorescence	0 : No Remedy	0 : No Remedy
			11. Delamination	- : This category is not exist.	- : This category is not exist.
			12. Abnormal Spacing	0 : No Remedy	- : This category is not exist.
			16. Other Types of Defects	X : Impossible to Fix a Method	X : Impossible to Fix a Method
			17. Defects of Reinforcing material	X : Impossible to Fix a Method	X : Impossible to Fix a Method
			18. Abnormal Anchorage	23 : Hand Applied Mortar	- : This category is not exist.
			19. Discoloration / Deterioration	- : This category is not exist.	- : This category is not exist.
			20. Water Leakage / Puddle	0 : No Remedy	- : This category is not exist.
			21. Abnormal Noise / Vibration	0 : No Remedy	0 : No Remedy
			22. Abnormal Deflection	0 : No Remedy	0 : No Remedy
			23. Deformation / Break	X : Impossible to Fix a Method	X : Impossible to Fix a Method
			1. Corrosion	11 : Repainting of Steel Member	10 : Supplementing Steel Plate
			2. Crack in Steel	12 : Stop hole+Supplementing Steel M : PMP Minor Repair Method	12 : Stop hole+Supplementing Steel M : PMP Minor Repair Method
			3. Loose or Missing Bolts	X : Impossible to Fix a Method	10 : Supplementing Steel Plate
			4. Fracture	11 : Repainting of Steel Member	X : Impossible to Fix a Method
			5. Deterioration of Paint System	11 : Repainting of Steel Member	- : This category is not exist.
6. Crack	21 : Crack Injection	22 : Crack Filling			
7. Spalling / Exposed Rebar	24 : Fluid Recasting Mortar	- : This category is not exist.			
8. Water leakage / Efflorescence	0 : No Remedy	0 : No Remedy			
11. Delamination	- : This category is not exist.	- : This category is not exist.			
16. Other Types of Defects	X : Impossible to Fix a Method	X : Impossible to Fix a Method			
17. Defects of Reinforcing material	X : Impossible to Fix a Method	- : This category is not exist.			
18. Abnormal Anchorage	0 : No Remedy	- : This category is not exist.			
19. Discoloration / Deterioration	- : This category is not exist.	- : This category is not exist.			
21. Abnormal Noise / Vibration	0 : No Remedy	0 : No Remedy			
22. Abnormal Deflection	0 : No Remedy	0 : No Remedy			
23. Deformation / Break	X : Impossible to Fix a Method	X : Impossible to Fix a Method			

Component	Element Type	Material	Type of Defects	CI Major Repair	DI Emergency 10 : Supplementing Steel Plate	
Bearings	Bearing Main Body Anchor Bolts	Steel (Rubber)	1. Corrosion	0 : No Remedy	12 : Stop hole+Supplementing Steel Plate M : PMP Minor Repair Method	
			2. Crack in Steel	0 : No Remedy	12 : Stop hole+Supplementing Steel Plate M : PMP Minor Repair Method	
			3. Loose or Missing Bolts	0 : No Remedy	12 : Stop hole+Supplementing Steel Plate M : PMP Minor Repair Method	
			4. Fracture	0 : No Remedy	12 : Stop hole+Supplementing Steel Plate M : PMP Minor Repair Method	
			5. Deterioration of Paint System	X : Impossible to Fix a Method	X : Impossible to Fix a Method	
			15. Function Disorder of Bearings	0 : No Remedy	X : Impossible to Fix a Method	
			16. Other Types of Defects	X : Impossible to Fix a Method	X : Impossible to Fix a Method	
			19. Discoloration / Deterioration	- : This category is not exist.	- : This category is not exist.	
			20. Water Leakage / Puddle	0 : No Remedy	- : This category is not exist.	
			21. Abnormal Noise / Vibration	0 : No Remedy	- : This category is not exist.	
			23. Deformation / Break	0 : No Remedy	0 : No Remedy	
			24. Accumulation of Debris	- : This category is not exist.	- : This category is not exist.	
			25. Settlement / Tilt / Movement	0 : No Remedy	0 : No Remedy	
			6. Crack	0 : No Remedy	23 : Hand Applied Mortar	
			7. Spalling / Exposed Rebar	23 : Hand Applied Mortar	- : This category is not exist.	
			11. Delamination	- : This category is not exist.	- : This category is not exist.	
			16. Other Types of Defects	X : Impossible to Fix a Method	X : Impossible to Fix a Method	
			20. Water Leakage / Puddle	0 : No Remedy	- : This category is not exist.	
			23. Deformation / Break	23 : Hand Applied Mortar	- : This category is not exist.	
			Concrete	Bearing Seat Mortar Bearing Bed concrete	Common	Common
			* Primary member	* Primary member		

Table < Evaluation Category and Remedy Measure >

Component	Element Type	Material	Type of Defects	CI Major Repair	DI Emergency 10 : Supplementing Steel Plate
Substructure	Abutment Pier Side Wall	Steel	1. Corrosion	0 : No Remedy	12 : Stop hole+Supplementing Steel Plate M : PMP Minor Repair Method
			2. Crack in Steel	0 : No Remedy	12 : Stop hole+Supplementing Steel Plate M : PMP Minor Repair Method
			3. Loose or Missing Bolts	0 : No Remedy	12 : Stop hole+Supplementing Steel Plate M : PMP Minor Repair Method
			4. Fracture	0 : No Remedy	12 : Stop hole+Supplementing Steel Plate M : PMP Minor Repair Method
			5. Deterioration of Paint System	X : Impossible to Fix a Method	X : Impossible to Fix a Method
			6. Crack	21 : Crack Injection	22 : Crack Filling
			7. Spalling / Exposed Rebar	23 : Hand Applied Mortar	- : This category is not exist.
			8. Water leakage / Efflorescence	0 : No Remedy	0 : No Remedy
			11. Delamination	- : This category is not exist.	- : This category is not exist.
			16. Other Types of Defects	X : Impossible to Fix a Method	X : Impossible to Fix a Method
			17. Defects of Reinforcing material	X : Impossible to Fix a Method	- : This category is not exist.
			19. Discoloration / Deterioration	- : This category is not exist.	- : This category is not exist.
			20. Water Leakage / Puddle	0 : No Remedy	- : This category is not exist.
			22. Abnormal Deflection	0 : No Remedy	0 : No Remedy
			23. Deformation / Break	0 : No Remedy	0 : No Remedy
			1. Corrosion	0 : No Remedy	0 : No Remedy
			2. Crack in Steel	0 : No Remedy	0 : No Remedy
			5. Deterioration of Paint System	0 : No Remedy	- : This category is not exist.
			6. Crack	21 : Crack Injection	22 : Crack Filling
			7. Spalling / Exposed Rebar	23 : Hand Applied Mortar	- : This category is not exist.
			11. Delamination	- : This category is not exist.	- : This category is not exist.
			16. Other Types of Defects	X : Impossible to Fix a Method	X : Impossible to Fix a Method
			17. Defects of Reinforcing material	0 : No Remedy	- : This category is not exist.
23. Deformation / Break	- : This category is not exist.	- : This category is not exist.			
25. Settlement / Tilt / Movement	31 : Repairing of Settlement	31 : Repairing of Settlement			
26. Scouring	32 : Repairing of Scouring	32 : Repairing of Scouring			
Concrete	Common	Common			
* Primary member	* Primary member				

Element Type	Material	Type of Defects	CI	DI	
Pavement > including Backside Approach - Secondary member - Secondary member	Others	13. Difference in Level	M : PMP Minor Repair Method 61 : Replacement of Asphalt Pavement (& Waterproofing) X : Impossible to Fix a Method	M : PMP Minor Repair Method - : This category is not exist. X : Impossible to Fix a Method	
		14. Abnormal Bluminous Pavement			
		16. Other Types of Defects	X : Impossible to Fix a Method	X : Impossible to Fix a Method	
		24. Accumulation of Debris	- : This category is not exist.	- : This category is not exist.	
	Common	1. Corrosion	51 : Repairing of Expansion Joint 0 : No Remedy	52 : Replacement of Expansion Joint 0 : No Remedy	
		2. Crack in Steel	0 : No Remedy	0 : No Remedy	
	Steel (Rubber)	3. Loose or Missing Bolts	M : PMP Minor Repair Method 51 : Repairing of Expansion Joint 0 : No Remedy	M : PMP Minor Repair Method 52 : Replacement of Expansion Joint - : This category is not exist.	
		4. Fracture	0 : No Remedy	- : This category is not exist.	
		5. Deterioration of Paint System	0 : No Remedy	0 : No Remedy	
		6. Crack	0 : No Remedy	0 : No Remedy	
	Expansion Joints (Rubber / Steel) > Including - elements of post-cast concrete	Concrete	11. Delamination	- : This category is not exist.	- : This category is not exist.
			12. Abnormal Spacing	0 : No Remedy	- : This category is not exist.
			13. Difference in Level	51 : Repairing of Expansion Joint 0 : No Remedy	52 : Replacement of Expansion Joint 0 : No Remedy
			16. Other Types of Defects	0 : No Remedy	0 : No Remedy
	Others	19. Discoloration / Deterioration	- : This category is not exist.	- : This category is not exist.	
		20. Water Leakage / Puddle	0 : No Remedy	- : This category is not exist.	
21. Abnormal Noise / Vibration		0 : No Remedy	- : This category is not exist.		
23. Deformation / Break		51 : Repairing of Expansion Joint - : This category is not exist.	52 : Replacement of Expansion Joint - : This category is not exist.		
Common	1. Corrosion	51 : Repairing of Expansion Joint 0 : No Remedy	52 : Replacement of Expansion Joint 0 : No Remedy		
	2. Crack in Steel	0 : No Remedy	0 : No Remedy		
	3. Loose or Missing Bolts	M : PMP Minor Repair Method 51 : Repairing of Expansion Joint 0 : No Remedy	M : PMP Minor Repair Method 52 : Replacement of Expansion Joint - : This category is not exist.		
	4. Fracture	0 : No Remedy	- : This category is not exist.		
Railing (Steel / Concrete) Curb (Concrete) > Including - Guard Fence - Wheel Guard - Median - Curb	Steel	1. Corrosion	11 : Repainting of Steel Member 0 : No Remedy	62 : Replacement of Railing Member 0 : No Remedy	
		2. Crack in Steel	0 : No Remedy	0 : No Remedy	
		3. Loose or Missing Bolts	M : PMP Minor Repair Method 0 : No Remedy	M : PMP Minor Repair Method 0 : No Remedy	
		5. Deterioration of Paint System	11 : Repainting of Steel Member 0 : No Remedy	- : This category is not exist.	
Concrete	6. Crack	0 : No Remedy	0 : No Remedy		
	7. Spalling / Exposed Rebar	0 : No Remedy	- : This category is not exist.		
	8. Water leakage / Efflorescence	0 : No Remedy	- : This category is not exist.		
	11. Delamination	- : This category is not exist.	- : This category is not exist.		
Others	16. Other Types of Defects	X : Impossible to Fix a Method	X : Impossible to Fix a Method		
	17. Defects of Reinforcing material	X : Impossible to Fix a Method	- : This category is not exist.		
	19. Discoloration / Deterioration	- : This category is not exist.	- : This category is not exist.		
	23. Deformation / Break	0 : No Remedy	62 : Replacement of Railing Member X : Impossible to Fix a Method		
Common	1. Corrosion	X : Impossible to Fix a Method	X : Impossible to Fix a Method		
	4. Fracture	X : Impossible to Fix a Method	X : Impossible to Fix a Method		
	5. Deterioration of Paint System	X : Impossible to Fix a Method	- : This category is not exist.		
	16. Other Types of Defects	X : Impossible to Fix a Method	X : Impossible to Fix a Method		
Drainage System > Including - Catch Basin - Drainage Pipe	Common	20. Water Leakage / Puddle	64 : Replacement of Drainage System X : Impossible to Fix a Method	- : This category is not exist.	
		23. Deformation / Break	X : Impossible to Fix a Method	X : Impossible to Fix a Method	
		24. Accumulation of Debris	- : This category is not exist.	- : This category is not exist.	

Element Type	Material	Type of Defects	CI	DI	
Pavement > including Backside Approach - Secondary member - Secondary member	Others	13. Difference in Level	M : PMP Minor Repair Method 61 : Replacement of Asphalt Pavement (& Waterproofing) X : Impossible to Fix a Method	M : PMP Minor Repair Method - : This category is not exist. X : Impossible to Fix a Method	
		14. Abnormal Bluminous Pavement			
		16. Other Types of Defects	X : Impossible to Fix a Method	X : Impossible to Fix a Method	
		24. Accumulation of Debris	- : This category is not exist.	- : This category is not exist.	
	Common	1. Corrosion	51 : Repairing of Expansion Joint 0 : No Remedy	52 : Replacement of Expansion Joint 0 : No Remedy	
		2. Crack in Steel	0 : No Remedy	0 : No Remedy	
	Steel (Rubber)	3. Loose or Missing Bolts	M : PMP Minor Repair Method 51 : Repairing of Expansion Joint 0 : No Remedy	M : PMP Minor Repair Method 52 : Replacement of Expansion Joint - : This category is not exist.	
		4. Fracture	0 : No Remedy	- : This category is not exist.	
		5. Deterioration of Paint System	0 : No Remedy	0 : No Remedy	
		6. Crack	0 : No Remedy	0 : No Remedy	
	Expansion Joints (Rubber / Steel) > Including - elements of post-cast concrete	Concrete	11. Delamination	- : This category is not exist.	- : This category is not exist.
			12. Abnormal Spacing	0 : No Remedy	- : This category is not exist.
			13. Difference in Level	51 : Repairing of Expansion Joint 0 : No Remedy	52 : Replacement of Expansion Joint 0 : No Remedy
			16. Other Types of Defects	0 : No Remedy	0 : No Remedy
	Others	19. Discoloration / Deterioration	- : This category is not exist.	- : This category is not exist.	
		20. Water Leakage / Puddle	0 : No Remedy	- : This category is not exist.	
21. Abnormal Noise / Vibration		0 : No Remedy	- : This category is not exist.		
23. Deformation / Break		51 : Repairing of Expansion Joint - : This category is not exist.	52 : Replacement of Expansion Joint - : This category is not exist.		
Common	1. Corrosion	51 : Repairing of Expansion Joint 0 : No Remedy	52 : Replacement of Expansion Joint 0 : No Remedy		
	2. Crack in Steel	0 : No Remedy	0 : No Remedy		
	3. Loose or Missing Bolts	M : PMP Minor Repair Method 51 : Repairing of Expansion Joint 0 : No Remedy	M : PMP Minor Repair Method 52 : Replacement of Expansion Joint - : This category is not exist.		
	4. Fracture	0 : No Remedy	- : This category is not exist.		
Railing (Steel / Concrete) Curb (Concrete) > Including - Guard Fence - Wheel Guard - Median - Curb	Steel	1. Corrosion	11 : Repainting of Steel Member 0 : No Remedy	62 : Replacement of Railing Member 0 : No Remedy	
		2. Crack in Steel	0 : No Remedy	0 : No Remedy	
		3. Loose or Missing Bolts	M : PMP Minor Repair Method 0 : No Remedy	M : PMP Minor Repair Method 0 : No Remedy	
		5. Deterioration of Paint System	11 : Repainting of Steel Member 0 : No Remedy	- : This category is not exist.	
Concrete	6. Crack	0 : No Remedy	0 : No Remedy		
	7. Spalling / Exposed Rebar	0 : No Remedy	- : This category is not exist.		
	8. Water leakage / Efflorescence	0 : No Remedy	- : This category is not exist.		
	11. Delamination	- : This category is not exist.	- : This category is not exist.		
Others	16. Other Types of Defects	X : Impossible to Fix a Method	X : Impossible to Fix a Method		
	17. Defects of Reinforcing material	X : Impossible to Fix a Method	- : This category is not exist.		
	19. Discoloration / Deterioration	- : This category is not exist.	- : This category is not exist.		
	23. Deformation / Break	0 : No Remedy	62 : Replacement of Railing Member X : Impossible to Fix a Method		
Common	1. Corrosion	X : Impossible to Fix a Method	X : Impossible to Fix a Method		
	4. Fracture	X : Impossible to Fix a Method	X : Impossible to Fix a Method		
	5. Deterioration of Paint System	X : Impossible to Fix a Method	- : This category is not exist.		
	16. Other Types of Defects	X : Impossible to Fix a Method	X : Impossible to Fix a Method		
Drainage System > Including - Catch Basin - Drainage Pipe	Common	20. Water Leakage / Puddle	64 : Replacement of Drainage System X : Impossible to Fix a Method	- : This category is not exist.	
		23. Deformation / Break	X : Impossible to Fix a Method	X : Impossible to Fix a Method	
		24. Accumulation of Debris	- : This category is not exist.	- : This category is not exist.	

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	23° 48' 20"	
							Long	90° 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			
Public Utilities Carried	-									
Bridge Length	25.40 (m)	No. of Spans	1	Span Arrangement	25.4		Skew Angle	-		
Superstructure	Bridge Type	RC Girder Bridge	Material	Concrete		Deck Slab	-			
	Abutment	RC	-	Foundation (Abutment)	Piled foundations					
Substructure	Pier	-	-	Foundation (Pier)	Piled foundations					
	Pavement	Asphalt	-	Rearrings	-					
Other Elements	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	-		
	Traffic Volume	1,000 to 5,000 Vehicles								A
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

1	GPS information	All bridge	BMS	Measured	<input type="checkbox"/>	<input type="checkbox"/>	Impossible to measure
2	Photos of bridge (Front, Side, Under)	All bridge	Measured	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Impossible to measure
3	Bridge Length	All bridge	BMS	Measured	<input type="checkbox"/>	<input type="checkbox"/>	Impossible to measure
4	Number of Spans	All bridge	BMS	Measured	<input type="checkbox"/>	<input type="checkbox"/>	Impossible to measure
5	Span length (each span)	All bridge	Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Impossible to measure
6	Widths of Bridge surface	All bridge	Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Impossible to measure
7	Number of Hinge (each span)	Girder Bridge	Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Impossible to measure

2. Under the bridge

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

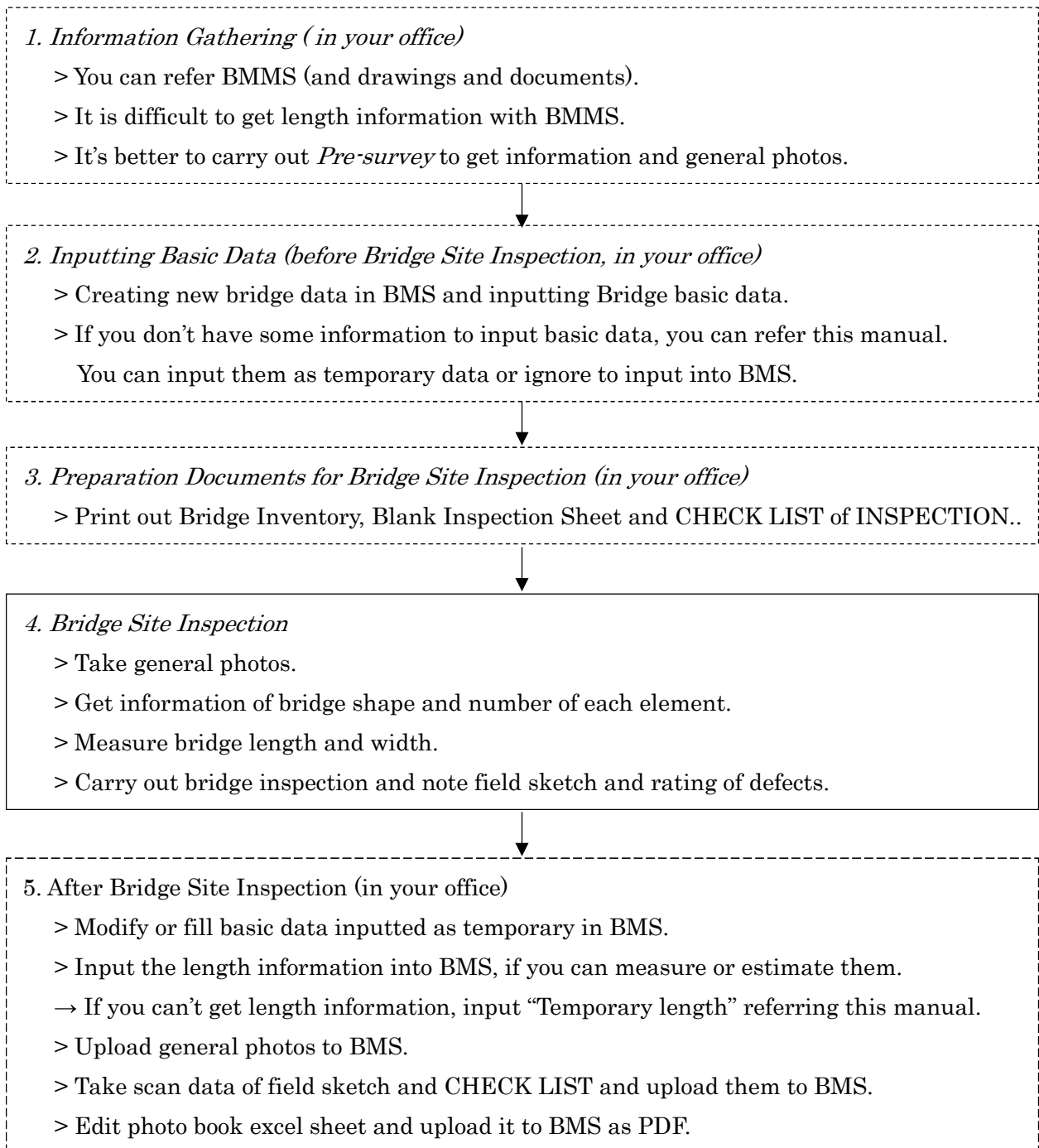


fig. Flowchart of Bridge Site Inspection

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 (refer 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 (refer 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.

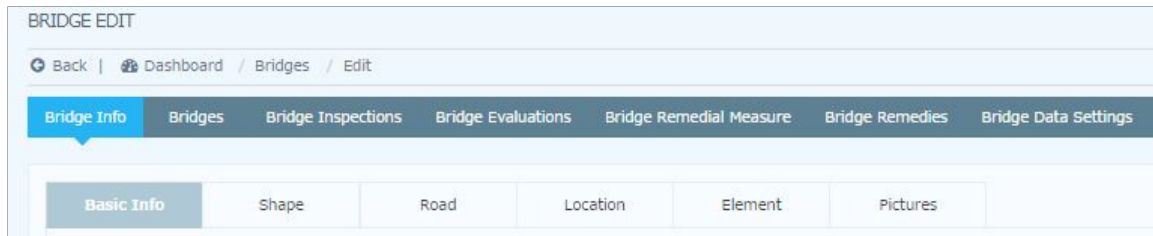
e.g. Height of Main Girder / Width of Main Girder / Interval of Main Girders

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 stream side” and “down stream side”. If the bridge locates upper stream side, add “1” as 13th letter. If down stream side, “2”.

[Temporary Input]

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

- YYYMMDDhhmm
: 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.

9. Crossing & Public Utility

Water pipe

If you don't know, no need to choose

Information Of River :
Meghna River

Information Of Water pipe :
a water pipe (owner is unknown) is attached under girdej

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.

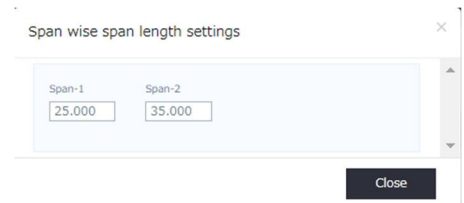
Click on the check box*.

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

1. Bridge Length*, 4. No. of Span*

5. Input Span Length and 6. Span Arrangement

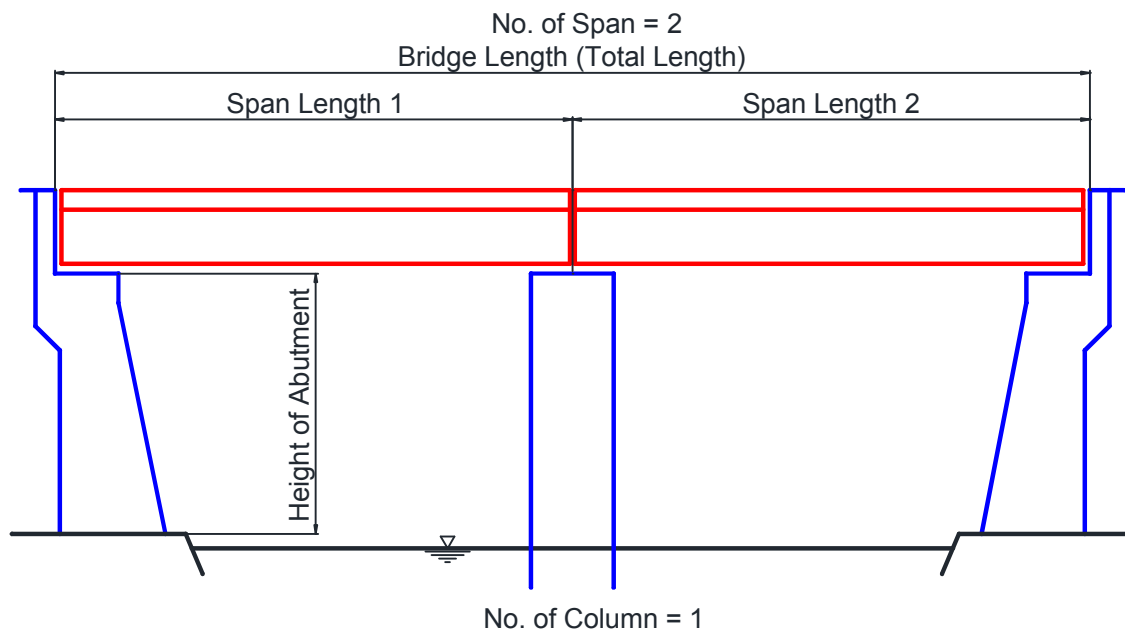
Input length of the bridge. If No. of Span is 1, Span length is same as Bridge Length. After inputting “4. No. of Span”, you can input span lengths in “5. Input Span Length” as same number as No. of Span.



[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.

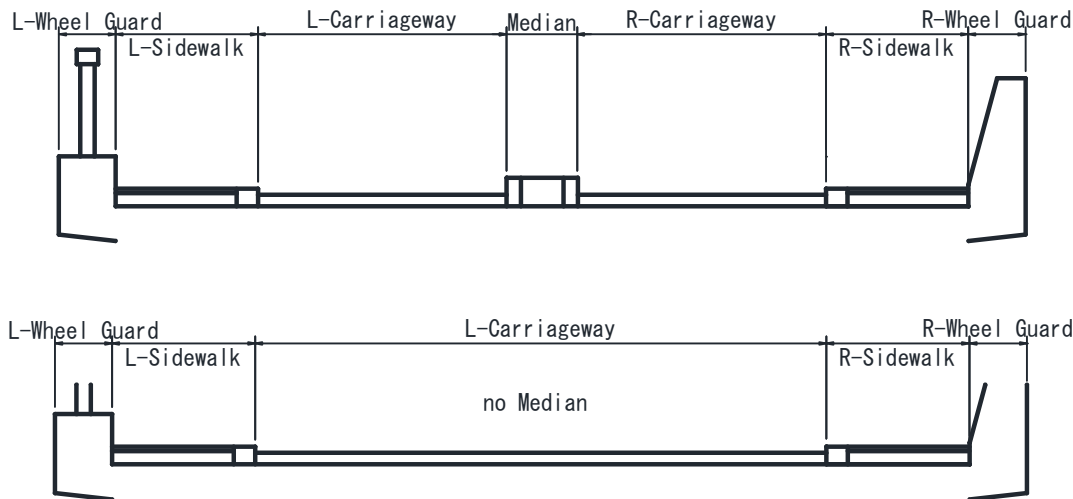
2. Bridge Width*, 3. Bridge Effective Width*,

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.

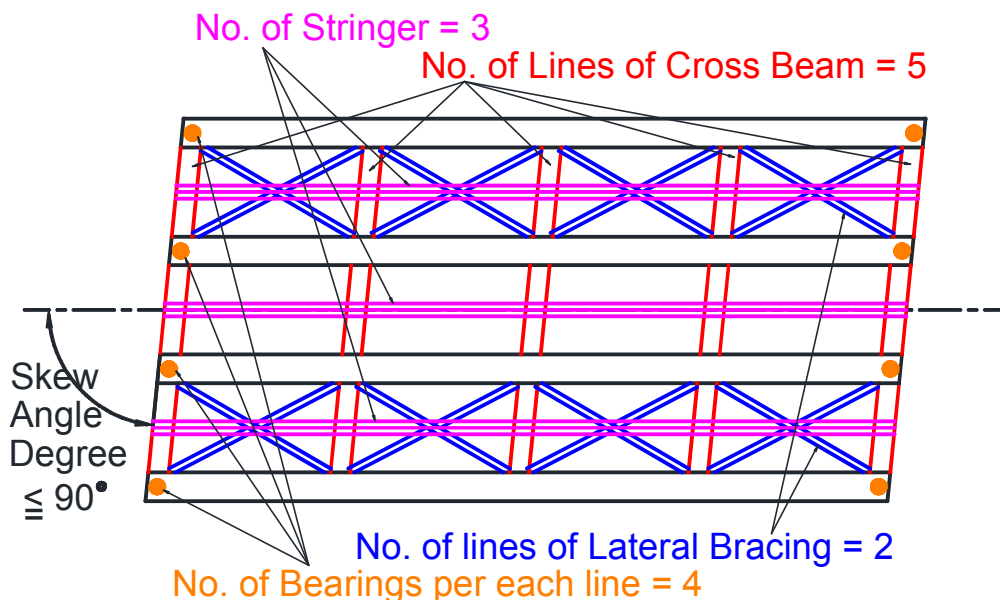
24. No. of Lines of Cross Beam (except Box Culvert)

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

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

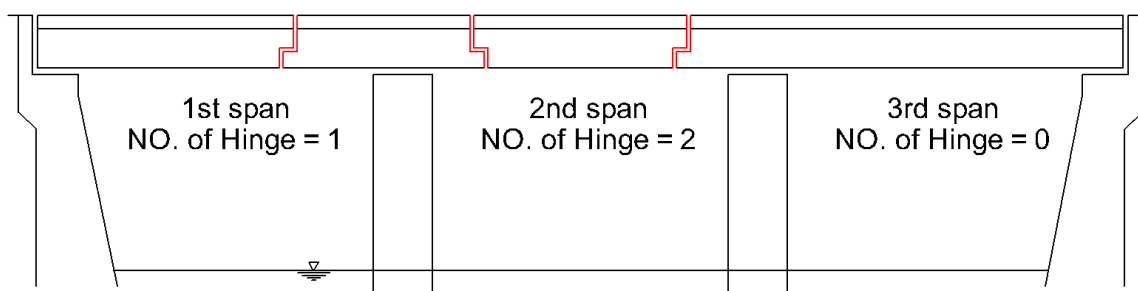
28. No. of Lines of Lateral Bracing (Steel Girder Bridge)

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.

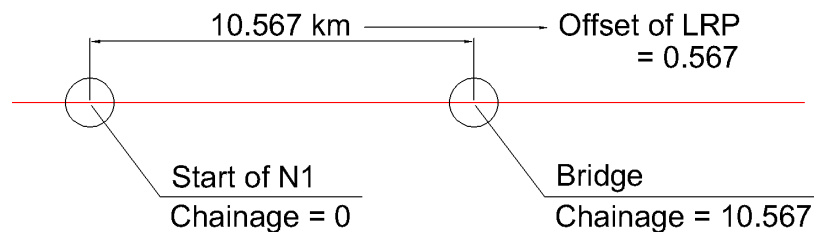
If you don't have the information, this cell should be blank.

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.

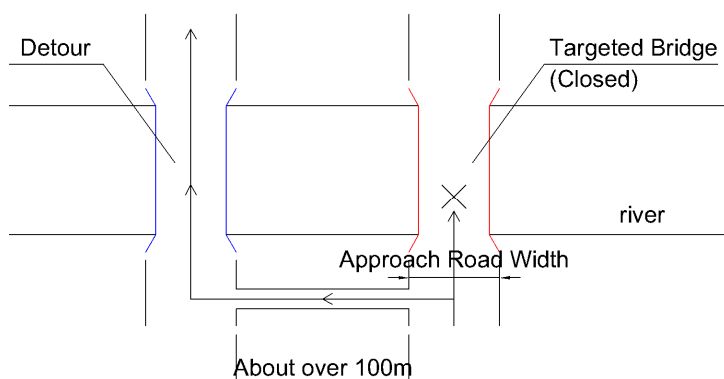
9. Approach Road Width

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).

Basic Info			
Road No.	NS03		
Road Name	Utholi-Aricha Road		
Class	National Highway	Starts at	Utholi
Length	3.269 Km	Ends at	Aricha
Traffic & Other Info			
Traffic (AADT)	7679 (Motorized: 5785 , Non-Motorized: 1894) Show details		
Average width	7.32 (m) Width Detail		
No. of bridges	8		
No. of ferry ghats	0		
Location referencing points - LRPs (what is a LRP?)	14 LRP Listing		
Location			

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 temporarily

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.

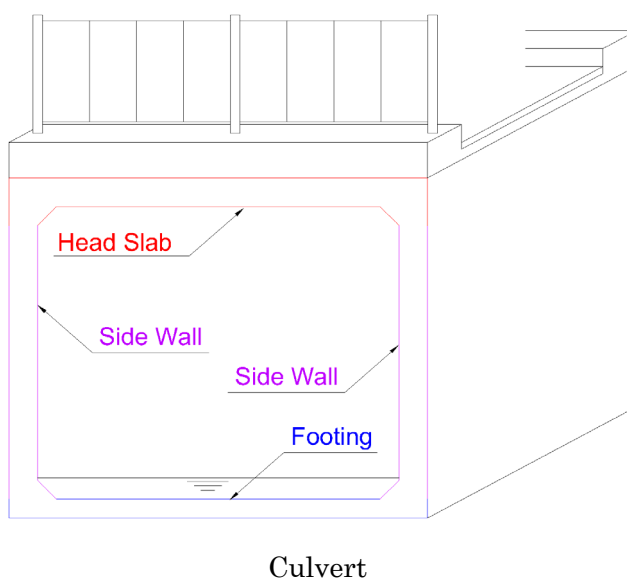
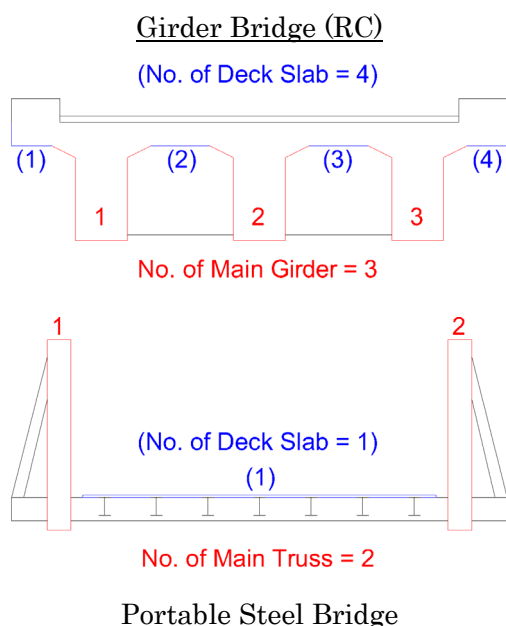
- “Girder Bridge” in following table includes “RC / PC / Steel Girder bridge, Box girder bridge, RC slab bridge, Rigid frame bridge and Small slab bridge”.
- “Truss Bailey” in following table includes “Truss PSB”.
- “Culvert” in following table includes “Box Culvert”.

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	<i>Remarks</i>	-	-	= 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	<i>Remark</i>	-	-	= No. of Main Girder + 1

Basic Shape of Girder Bridge / Bailey 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

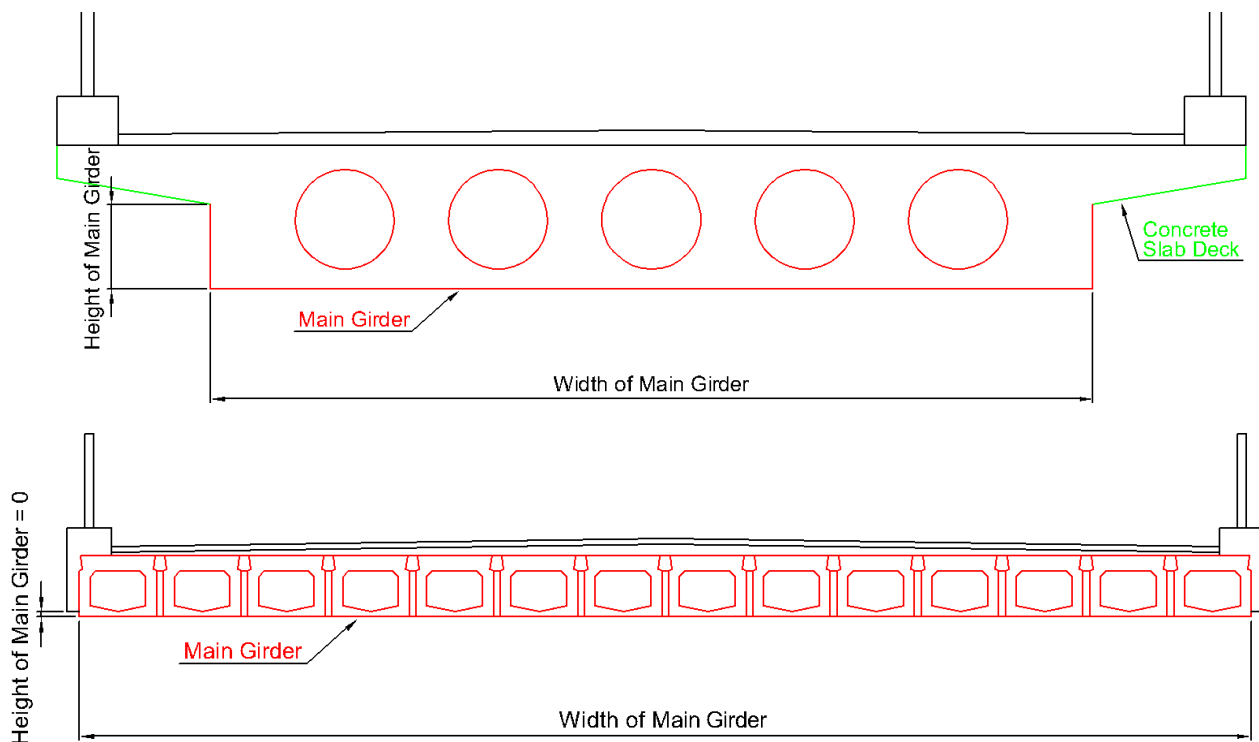
This chapter shows formula to calculate temporary length of main girder or box culvert.

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]



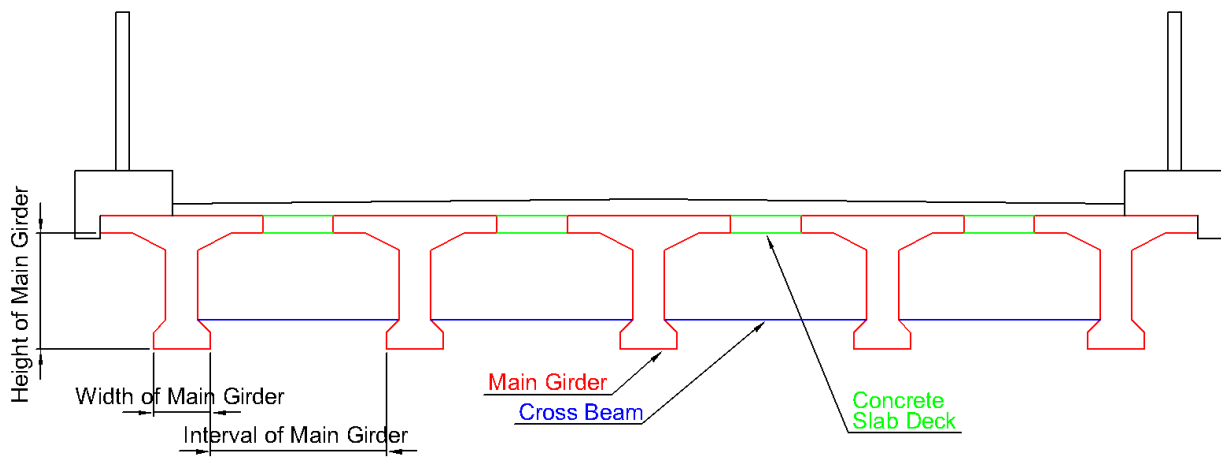
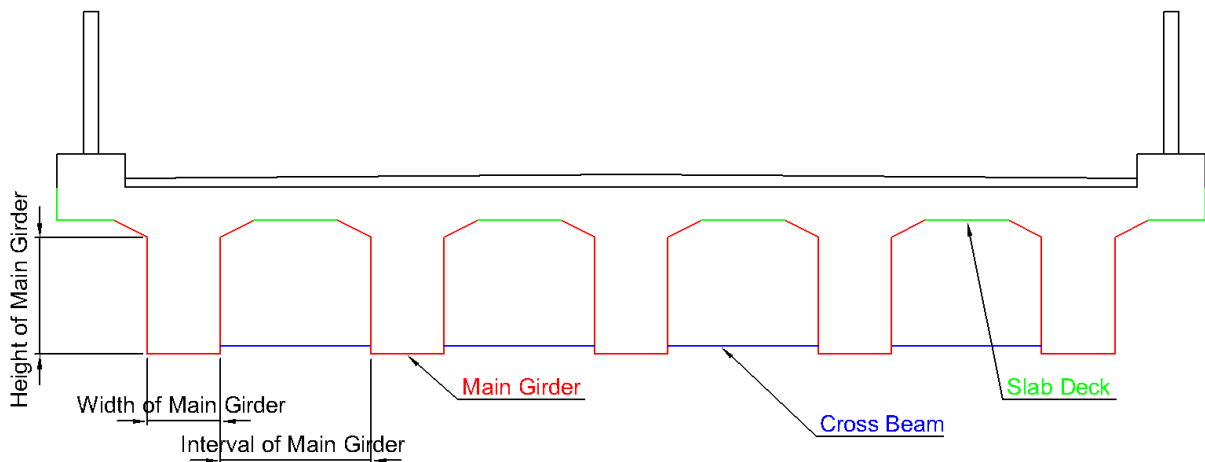
- Interval of Main Girder : input always “0”.
- Height of Main Girder : Temporary = “0”
- Width of Main Girder : Temporary = “Effective Width”

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]



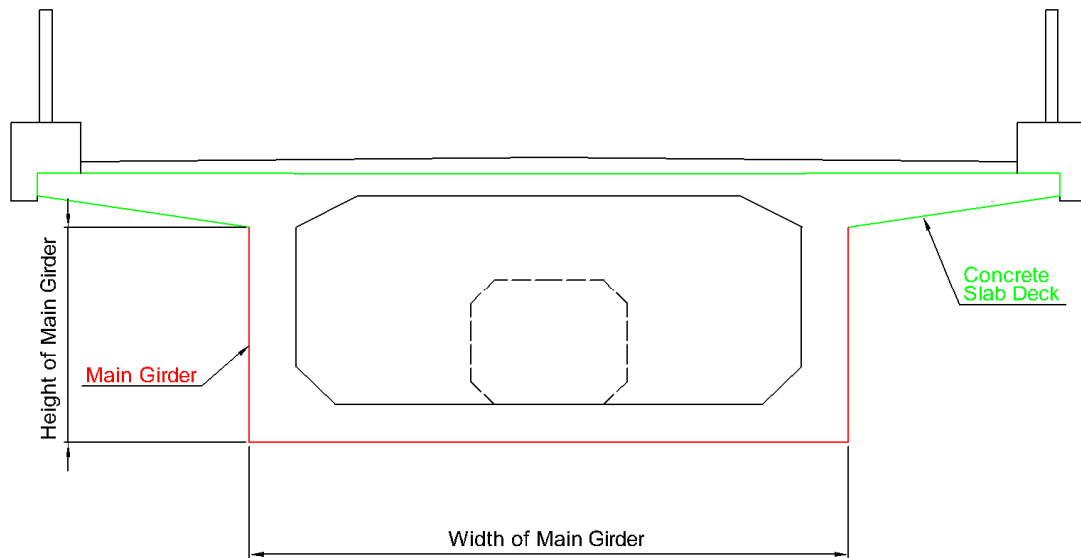
- Interval of Main Girder : Temporary = “Effective Width” / (“NO. of Main Girder” - 1)
- Height of Main Girder : Temporary = “Span Length” / 15
- Width of Main Girder : Temporary = 0.300 m

e.g. Temporary input case

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

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

[RC Box Girder Bridge / PC Box Girder Bridge]



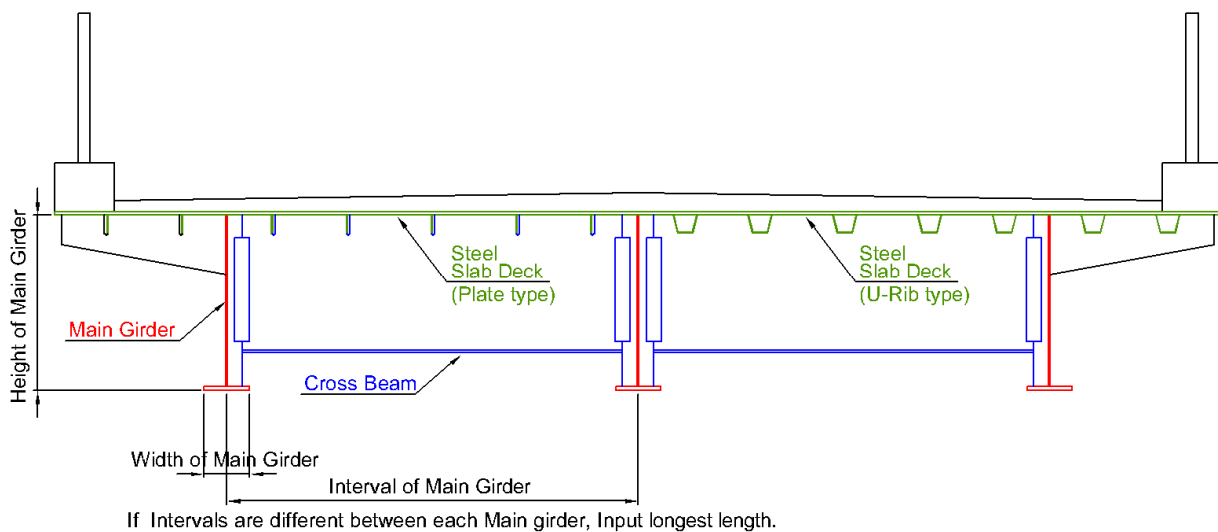
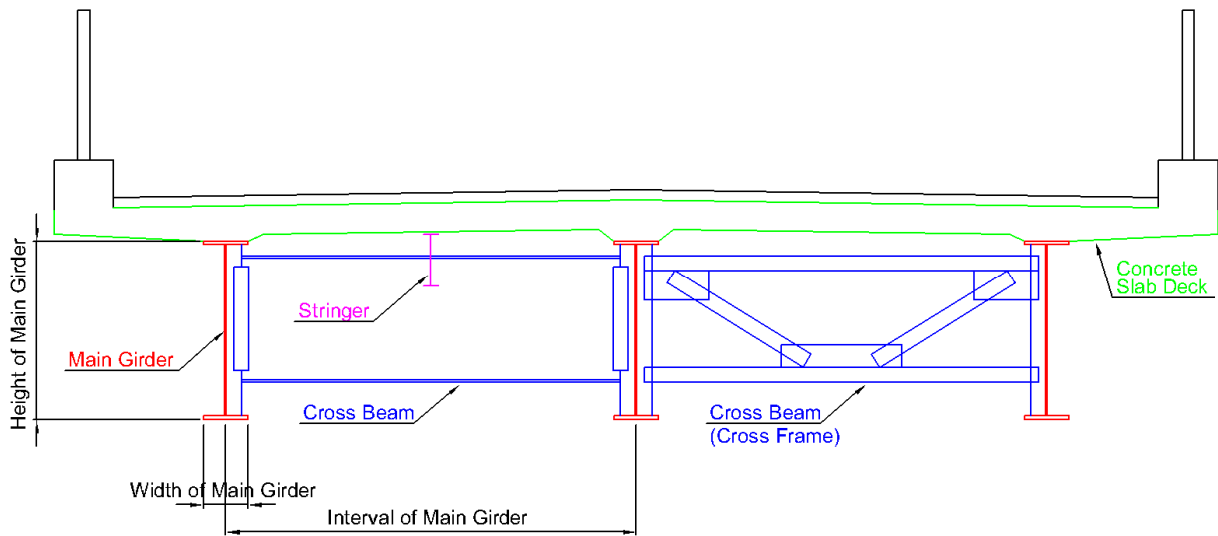
- Interval of Main Girder : input always “0”
- Height of Main Girder : Temporary = “Span Length” / 15
- Width of Main Girder : “Effective Width”

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 = $30.000\text{m} / 15 = 2.000\text{m}$: temporary
- Width of Main Girder = 10.000m : temporary

[Steel Girder Bridge]



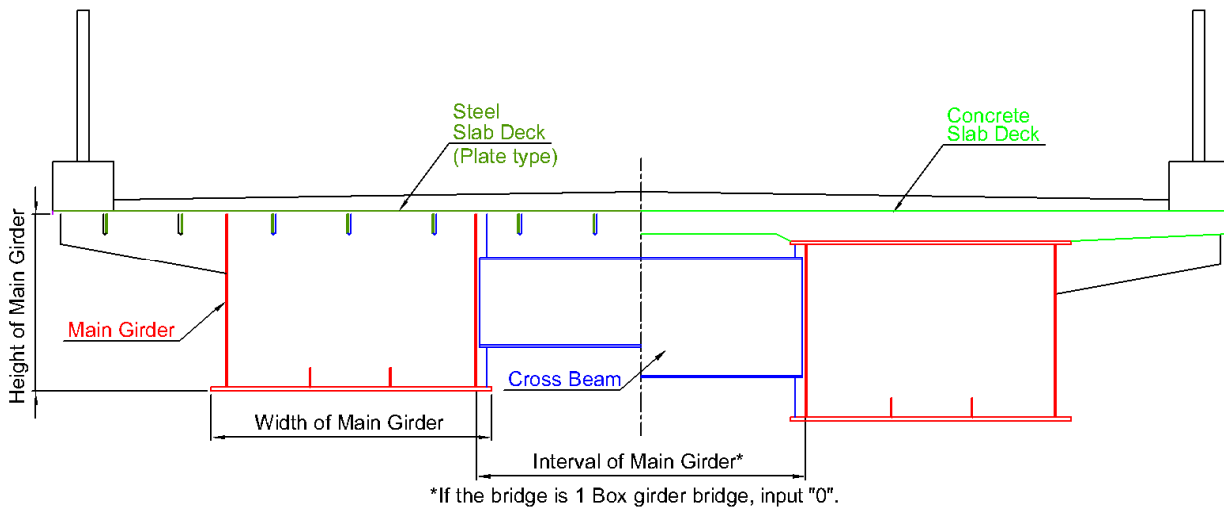
- Interval of Main Girder : Temporary = “Effective Width” / “NO. of Main Girder”
- Height of Main Girder : Temporary = “Span Length” / 15
- Width of Main Girder : Temporary = “Height of Main Girder” / 5

e.g. Temporary input case

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

- Interval of Main Girder = $7.500\text{m} / 3 = 2.500\text{m}$: temporary
- Height of Main Girder = $30.000\text{m} / 15 = 2.000\text{m}$: temporary
- Width of Main Girder = $2.000\text{m} / 5 = 0.400\text{m}$: 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)

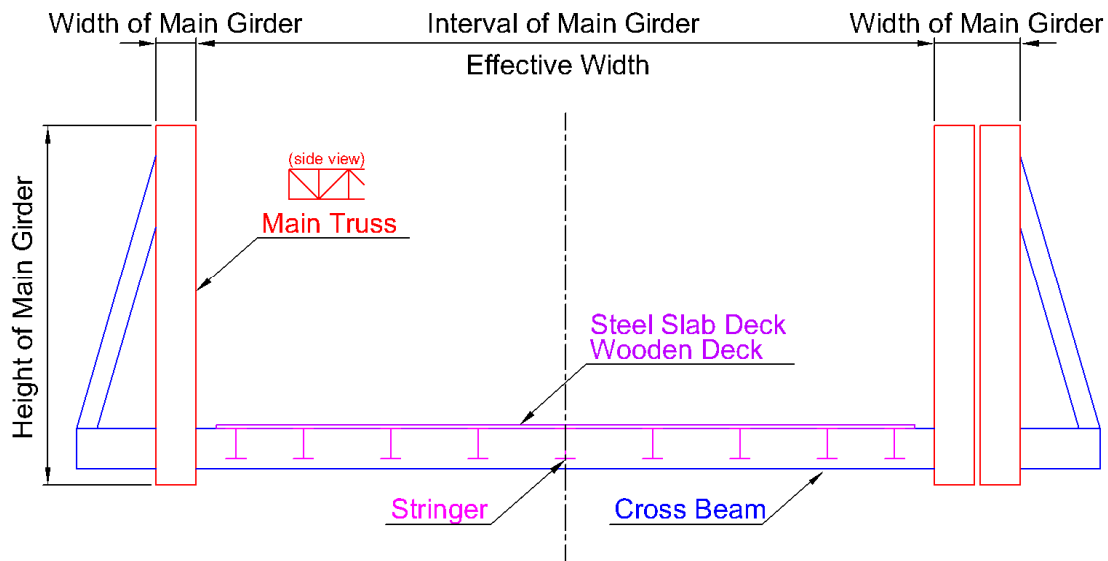
- Height of Main Girder : Temporary = “Span Length” / 15
- Width of Main Girder : Temporary = “Effective Width”
- Interval of Main Girder : input always “0”

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]

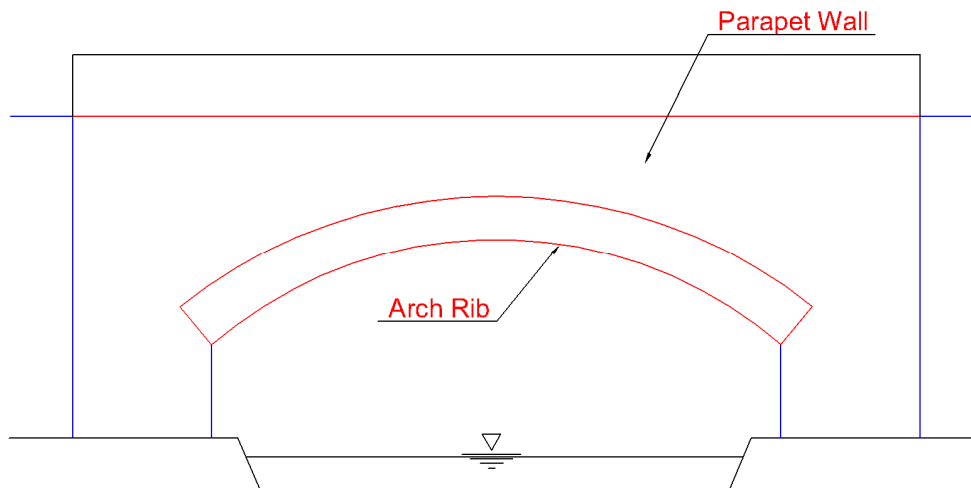


- Interval of Main Girder : always same as “Effective Width”.
- Height of Main Girder : Temporary = 2.000 m
- Width of Main Girder : Temporary = 0.200 m

[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

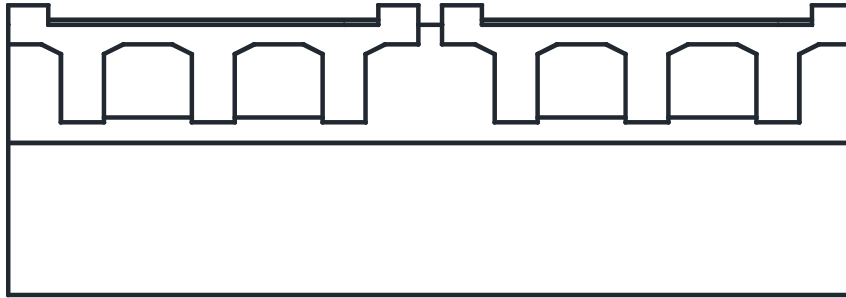
- Number of Main Girder, cross beam and so on of Basic Data should be inputted as maximum number of main girder in all spans.
- Inspection sheet and Evaluation sheet of Mixed Types Bridge consist of “All types of defects” (both of types of defects of “Concrete” or “Steel (rubber)”.

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

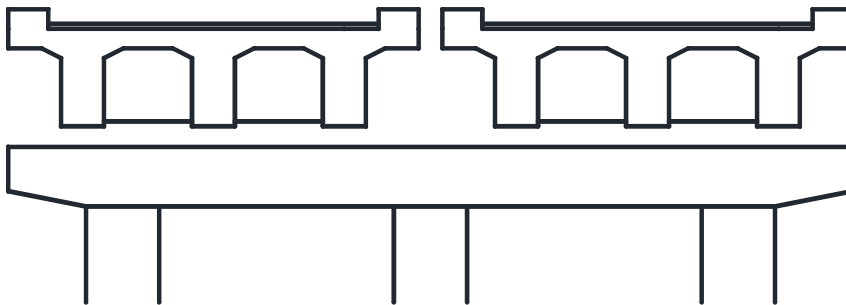
Cells of evaluation sheet not required (e.g. concrete defect of steel element) should be inputted as “N“.

[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

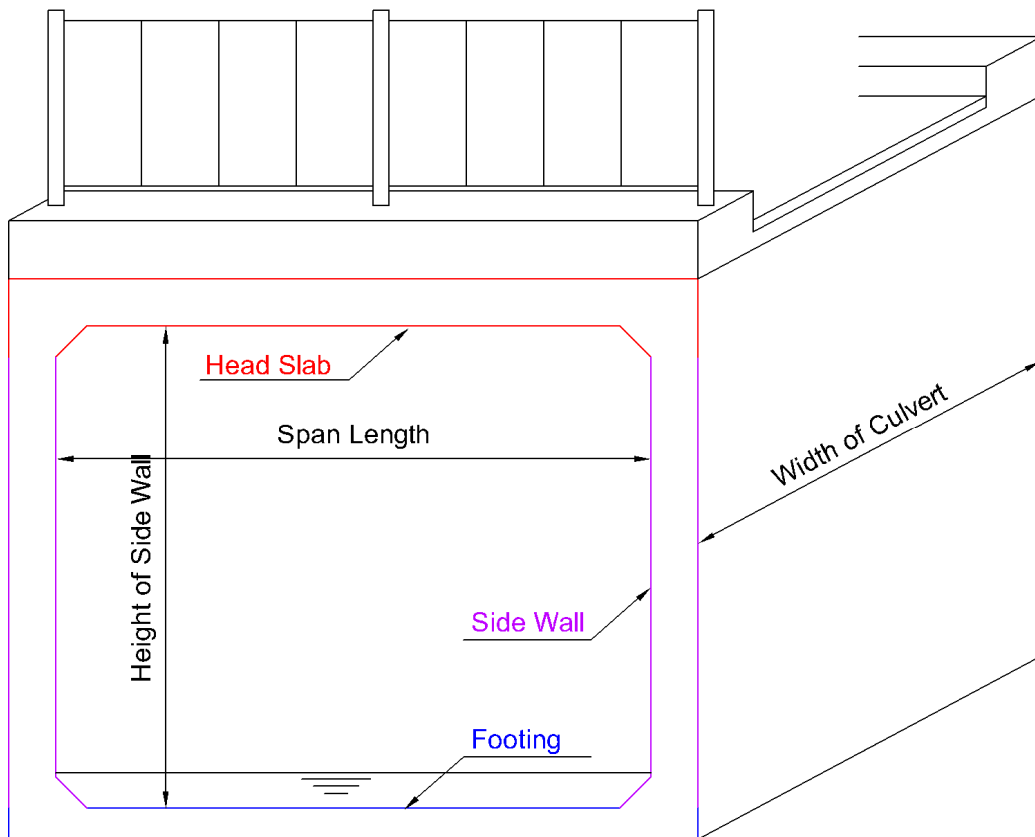


e.g. One Pier with parallel bridges

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

e.g. Temporary input case

If Bridge width = 7.500m,

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



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