

Damage classification of members

Bridge name		006Memorial										Span No.					2	
		Damages of steel members				Damages of concrete members						Others					Remarks	
		Corrosion	Cracking	Missing bolts	Fracture	Cracking, Water leakage, Free lime	No.	Rebar exposure	Pop-outs	Deck cracking	Damages at anchorage of PC tender	Level difference of road surface	Functional damage of bearings	Damages in substructures	Damages in pavements	Damages in expansion joints		Damages in cable
Upper chord member	01	b	a	a	a													
	02	b	a	a	a													
Bottom chord member	01	d	a	e	a													
	02	d	a	e	a													
Diagonal	01	a	a	a	a													
	02	b	a	a	a													
Vertical member	01	a	a	a	a													
	02	a	a	a	a													
Lateral bracing (Upper)	01	a	a	a	a													
	02	a	a	a	a													
Lateral bracing (Lower)	01	a	a	a	a													
	02	a	a	a	a													
Sway bracing (Upper)	01	a	a	a	a													
Stringer	01	a	a	a	a													
	02	a	a	a	a													
	03	a	a	a	a													
	04	a	a	a	a													
	05	a	a	a	a													
	06	a	a	a	a													
	07	a	a	a	a													
	08	a	a	a	a													
	09	a	a	a	a													
	10	a	a	a	a													
Floor beam	01	a	a	a	a													
	02	a	a	a	a													
	03	a	a	a	a													
Sway bracing (Lower)	01	d	a	e	a													
Sway bracing (Lower)	01							a	a	c	a							
	02							a	a	a	a							
	03							a	a	a	a							
	04							a	a	a	a							
	05							a	a	a	a							
	06							a	a	a	a							
	07							a	a	a	a							
	08							a	a	a	a							
	09							a	a	a	a							
	10							a	a	a	a							
	11							a	a	a	a							
	12							a	a	a	a							
	13							a	a	a	c	a						
Pier	01					c	-	a						a				
	02					c	-	a						a				
Bearings	101												a					
	102												a					
	201												a					
	202												a					
Road surface											a			a				
Barriers Railings	01															a		
	02															a		
Expansion joints	01																a	
	02																	

Estimation of repair quantity

Bridge name		006Memorial		Span No.		2		
Subject			Quantity		Remarks			
1	Span length		69.658 m		Length of 1 span			
2	Road width for pavement		10.6 m		Width for pavement area (Vehicle lane)			
3	Total road width		17.8 m		Deck width			
4	Area of bridge surface		1,239.9 m <sup>2</sup>		Span length x Total width			
5	Area of pavement		738.4 m <sup>2</sup>		Span length x Width for pavement			
6	Barriers & railings	01	concrete		Type of barriers & railings			
		02	concrete		Same as above			
		03	-		Same as above			
		04	-		Same as above			
7	Expansion joints	01	steel		Type of expansion joint			
		02	steel		Same as above			
8	Painting area		Total %	Number of members	Member %	Painting area	Remarks	
	Total painting area		100.0%	1	-	5,600.0 m <sup>2</sup>		
	Main structure	52.0%	Upper chord	65.0%	33.8%	2	16.9%	950.0 m <sup>2</sup> Experience value
			Bottom chord	35.0%	18.2%	2	9.1%	510.0 m <sup>2</sup> Experience value
	Sway bracing Lateral bracing Portal frame	18.0%	Diagonal	20.0%	3.6%	2	1.8%	110.0 m <sup>2</sup> Experience value
			Vertical member	15.0%	2.7%	2	1.4%	80.0 m <sup>2</sup> Experience value
			Lateral bracing (Upper)	20.0%	3.6%	2	1.8%	110.0 m <sup>2</sup> Experience value
			Lateral bracing (Lower)	15.0%	2.7%	2	1.4%	80.0 m <sup>2</sup> Experience value
			Sway bracing (Upper)	15.0%	2.7%	1	2.7%	160.0 m <sup>2</sup> Experience value
			Sway bracing (Upper)	15.0%	2.7%	1	2.7%	160.0 m <sup>2</sup> Experience value
	Floor system	32.0%	Stringer	60.0%	19.2%	10	1.9%	110.0 m <sup>2</sup> Experience value
			Floor beam	40.0%	12.8%	15%	1.9%	110.0 m <sup>2</sup> End floor beam(15% pos. )
70%						9.0%	510.0 m <sup>2</sup> Interm. floor beam(70% for all)	
9	Repaired area of deck		Quantity		Remarks			
	Divided area A		95.4 m <sup>2</sup>		13 div. Area of bridge surface / number of division			
	Area of rebar exposure		11.4 m <sup>2</sup>		A × 0.120			
	Area of deck cracking		59.1 m <sup>3</sup>		A × 0.620			
10	Repair quantity of substructure		Quantity		Remarks			
	Cracking, Water leakage, Free lime		5.54 m		per substructure			
	Rebar exposure		2.24 m <sup>2</sup>		per substructure			
11	Concrete barrier		Quantity		Remarks			
	Rebar exposure		4.96 m <sup>2</sup>		A of bridge surf. x 0.004			

Countermeasure classification of members

Bridge name		006Memorial				Span No.			2			
Member	No.	Damage	Damage classification		Countermeasure classification	Member	No.	Damage	Damage classification		Countermeasure classification	
			Classification	Judge					Classification	Judge		
Upper chord	01	Corrosion	b	-	4	Sway bracing (Upper)	01	Corrosion	a	-	5	
		Cracking	a	-	5			Cracking	a	-	5	
		Missing bolts	a	-	5			Missing bolts	a	-	5	
		Fracture	a	-	5			Fracture	a	-	5	
	02	Corrosion	b	-	4		01	Corrosion	a	-	5	
		Cracking	a	-	5			Cracking	a	-	5	
		Missing bolts	a	-	5			Missing bolts	a	-	5	
		Fracture	a	-	5			Fracture	a	-	5	
Bottom chord	01	Corrosion	d	-	2		Stringer	02	Corrosion	a	-	5
		Cracking	a	-	5				Cracking	a	-	5
		Missing bolts	e	-	2				Missing bolts	a	-	5
		Fracture	a	-	5				Fracture	a	-	5
	02	Corrosion	d	-	2			03	Corrosion	a	-	5
		Cracking	a	-	5				Cracking	a	-	5
		Missing bolts	e	-	2				Missing bolts	a	-	5
		Fracture	a	-	5				Fracture	a	-	5
Diagonal	01	Corrosion	a	-	5	04		Corrosion	a	-	5	
		Cracking	a	-	5			Cracking	a	-	5	
		Missing bolts	a	-	5			Missing bolts	a	-	5	
		Fracture	a	-	5			Fracture	a	-	5	
	02	Corrosion	b	-	4	05		Corrosion	a	-	5	
		Cracking	a	-	5			Cracking	a	-	5	
		Missing bolts	a	-	5			Missing bolts	a	-	5	
		Fracture	a	-	5			Fracture	a	-	5	
Vertical member	01	Corrosion	a	-	5	06	Corrosion	a	-	5		
		Cracking	a	-	5		Cracking	a	-	5		
		Missing bolts	a	-	5		Missing bolts	a	-	5		
		Fracture	a	-	5		Fracture	a	-	5		
	02	Corrosion	a	-	5	07	Corrosion	a	-	5		
		Cracking	a	-	5		Cracking	a	-	5		
		Missing bolts	a	-	5		Missing bolts	a	-	5		
		Fracture	a	-	5		Fracture	a	-	5		
Lateral bracing (Upper)	01	Corrosion	a	-	5	08	Corrosion	a	-	5		
		Cracking	a	-	5		Cracking	a	-	5		
		Missing bolts	a	-	5		Missing bolts	a	-	5		
		Fracture	a	-	5		Fracture	a	-	5		
	02	Corrosion	a	-	5	09	Corrosion	a	-	5		
		Cracking	a	-	5		Cracking	a	-	5		
		Missing bolts	a	-	5		Missing bolts	a	-	5		
		Fracture	a	-	5		Fracture	a	-	5		
Lateral bracing (Lower)	01	Corrosion	a	-	5	10	Corrosion	a	-	5		
		Cracking	a	-	5		Cracking	a	-	5		
		Missing bolts	a	-	5		Missing bolts	a	-	5		
		Fracture	a	-	5		Fracture	a	-	5		
	02	Corrosion	a	-	5							
		Cracking	a	-	5							
		Missing bolts	a	-	5							
		Fracture	a	-	5							

Bridge name		006Memorial				Span No.		2			
Member	No.	Damage	Damage classification		Countermeasure classification	Member	No.	Damage	Damage classification		Countermeasure classification
			Classification	Judge					Classification	Judge	
Floor beam	01	Corrosion	a	-	5	Deck	08	Rebar exposure	a	-	5
		Cracking	a	-	5			Pop-outs	a	-	5
		Missing bolts	a	-	5			Deck cracking	a	-	5
		Fracture	a	-	5			Damages at anchorage of PC tendon	a	-	5
	02	Corrosion	a	-	5		09	Rebar exposure	a	-	5
		Cracking	a	-	5			Pop-outs	a	-	5
		Missing bolts	a	-	5			Deck cracking	a	-	5
		Fracture	a	-	5			Damages at anchorage of PC tendon	a	-	5
	03	Corrosion	a	-	5		10	Rebar exposure	a	-	5
		Cracking	a	-	5			Pop-outs	a	-	5
		Missing bolts	a	-	5			Deck cracking	a	-	5
		Fracture	a	-	5			Damages at anchorage of PC tendon	a	-	5
Sway bracing (Lower)	01	Corrosion	d	-	2	11	Rebar exposure	a	-	5	
		Cracking	a	-	5		Pop-outs	a	-	5	
		Missing bolts	e	-	2		Deck cracking	a	-	5	
		Fracture	a	-	5		Damages at anchorage of PC tendon	a	-	5	
Deck	01	Rebar exposure	a	-	5	12	Rebar exposure	a	-	5	
		Pop-outs	a	-	5		Pop-outs	a	-	5	
		Deck cracking	c	-	3		Deck cracking	a	-	5	
		Damages at anchorage of PC tendon	a	-	5		Damages at anchorage of PC tendon	a	-	5	
	02	Rebar exposure	a	-	5	13	Rebar exposure	a	-	5	
		Pop-outs	a	-	5		Pop-outs	a	-	5	
		Deck cracking	a	-	5		Deck cracking	c	-	3	
		Damages at anchorage of PC tendon	a	-	5		Damages at anchorage of PC tendon	a	-	5	
	03	Rebar exposure	a	-	5	Substructure	01	Cracking etc.	c	-	3
		Pop-outs	a	-	5		Rebar exposure	a	-	5	
		Deck cracking	a	-	5		Damages in substructures	a	-	5	
		Damages at anchorage of PC tendon	a	-	5		02	Cracking etc.	c	-	3
	04	Rebar exposure	a	-	5	Bearings	Rebar exposure	a	-	5	
		Pop-outs	a	-	5		Damages in substructures	a	-	5	
		Deck cracking	a	-	5		101	Functional damage of bearings	a	-	5
		Damages at anchorage of PC tendon	a	-	5		102	Functional damage of bearings	a	-	5
	05	Rebar exposure	a	-	5	Road surface	201	Functional damage of bearings	a	-	5
		Pop-outs	a	-	5		202	Functional damage of bearings	a	-	5
		Deck cracking	a	-	5		01	Level difference of road surface	a	-	5
		Damages at anchorage of PC tendon	a	-	5		01	Damages in pavements	a	-	5
	06	Rebar exposure	a	-	5	Barriers and Railings	01	Damages in barriers	a	-	5
		Pop-outs	a	-	5		02	Damages in barriers	a	-	5
		Deck cracking	a	-	5		03	Damages in barriers	-	-	-
		Damages at anchorage of PC tendon	a	-	5		04	Damages in barriers	-	-	-
	07	Rebar exposure	a	-	5	Expansion joints	01	Damages in expansion joints	a	-	5
		Pop-outs	a	-	5		02	Damages in expansion joints	-	-	-
		Deck cracking	a	-	5						
		Damages at anchorage of PC tendon	a	-	5						

Approximate repair price for countermeasures

Bridge name		006Memorial				Span No.		2		countermeasure classification		countermeasure classification		Planned repair & reconstruction			
Member	No.	Damage	Damage classification	Countermeasure classification	Repair method	Repair quantity	Unit	Approximate unit price (b)	Approximate repair price (t)	Approximate repair price for countermeasure classification 1 & 2 (b)	Repair price (b)	Remaining years up to countermeasure el 2	Repair price (b)	Remaining years up to countermeasure el 2	Repair price (b)	Life cycle	
Upper chord	01	Corrosion	b	4	Repointing	950.0	m <sup>2</sup>	3,500	3,325,000	-	-	5	3,325,000	10	3,325,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	-
	02	Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
		Corrosion	b	4	Repointing	950.0	m <sup>2</sup>	3,500	3,325,000	-	-	5	3,325,000	10	3,325,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
Bottom chord	01	Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
		Corrosion	d	2	Repointing	510.0	m <sup>2</sup>	3,500	1,785,000	1,785,000	-	5	-	10	1,785,000	20	
	02	Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
		Missing bolts	e	2	Bolt change for splice pt.	1.0	Pos.	133,400	133,400	133,400	-	-	-	-	-	-	-
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
Diagonal	01	Corrosion	d	2	Repointing	510.0	m <sup>2</sup>	3,500	1,785,000	1,785,000	-	5	-	10	1,785,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Missing bolts	e	2	Bolt change for splice pt.	1.0	Pos.	133,400	133,400	133,400	-	-	-	-	-	-	-
	02	Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
		Corrosion	d	2	Repointing	510.0	m <sup>2</sup>	3,500	1,785,000	1,785,000	-	5	-	10	1,785,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
Vertical member	01	Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
		Corrosion	b	4	Repointing	110.0	m <sup>2</sup>	3,500	385,000	385,000	-	5	-	10	385,000	20	
	02	Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	-
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
Lateral bracing	01	Corrosion	a	5	Repointing	80.0	m <sup>2</sup>	3,500	280,000	280,000	-	5	-	10	280,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	-
	02	Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
		Corrosion	a	5	Repointing	110.0	m <sup>2</sup>	3,500	385,000	385,000	-	5	-	10	385,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
Lateral bracing (Lower)	01	Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
		Corrosion	a	5	Repointing	110.0	m <sup>2</sup>	3,500	385,000	385,000	-	5	-	10	385,000	20	
	02	Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	-
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
Stringer	01	Corrosion	a	5	Repointing	160.0	m <sup>2</sup>	3,500	560,000	560,000	-	5	-	10	560,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
	02	Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
		Corrosion	a	5	Repointing	110.0	m <sup>2</sup>	3,500	385,000	385,000	-	5	-	10	385,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
Stringer	03	Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Corrosion	a	5	Repointing	110.0	m <sup>2</sup>	3,500	385,000	385,000	-	5	-	10	385,000	20	
	04	Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	
Stringer	05	Corrosion	a	5	Repointing	110.0	m <sup>2</sup>	3,500	385,000	385,000	-	5	-	10	385,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
	06	Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Corrosion	a	5	Repointing	110.0	m <sup>2</sup>	3,500	385,000	385,000	-	5	-	10	385,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
Stringer	07	Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Corrosion	a	5	Repointing	110.0	m <sup>2</sup>	3,500	385,000	385,000	-	5	-	10	385,000	20	
	08	Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	
Stringer	09	Corrosion	a	5	Repointing	110.0	m <sup>2</sup>	3,500	385,000	385,000	-	5	-	10	385,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
	10	Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Corrosion	a	5	Repointing	110.0	m <sup>2</sup>	3,500	385,000	385,000	-	5	-	10	385,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
Floor beam	01	Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Corrosion	a	5	Repointing	110.0	m <sup>2</sup>	3,500	385,000	385,000	-	5	-	10	385,000	20	
	02	Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	
Sway bracing (Lower)	01	Corrosion	d	2	Repointing	160.0	m <sup>2</sup>	3,500	560,000	560,000	-	5	-	10	560,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Missing bolts	e	2	Bolt change for splice pt.	1.0	Pos.	133,400	133,400	133,400	-	-	-	-	-	-	

Member	No.	Damage	Damage classification	Countermeasure classification	Repair method	Repair quantity	Unit	Approximate unit price (B)	Approximate repair price (B)	Approximate repair price for countermeasure classification 1 & 2 (B)	countermeasure classification 3		countermeasure classification 4		Planned repair & reconstruction		
											Repair price (B)	Remaining years up to countermeasure cl. 2	Repair price (B)	Remaining years up to countermeasure cl. 2	Repair price (B)	Life cycle	
Deck	01	Rebar exposure	a	5	Patching	11.4	m <sup>2</sup>	17,500	199,500	-	-	7	-	15	-	30	
		Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	
		Deck cracking	c	3	CFR	59.1	m <sup>2</sup>	22,500	1,329,800	-	1,329,800	7	-	15	1,329,800	30	
	02	Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	
		Rebar exposure	a	5	Patching	11.4	m <sup>2</sup>	17,500	199,500	-	-	7	-	15	-	30	
		Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	
	03	Deck cracking	a	5	CFR	59.1	m <sup>2</sup>	22,500	1,329,800	-	-	7	-	15	1,329,800	30	
		Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	
		Rebar exposure	a	5	Patching	11.4	m <sup>2</sup>	17,500	199,500	-	-	7	-	15	-	30	
	04	Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	
		Deck cracking	a	5	CFR	59.1	Pos.	22,500	1,329,800	-	-	7	-	15	1,329,800	30	
		Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	
	05	Rebar exposure	a	5	Patching	11.4	m <sup>2</sup>	17,500	199,500	-	-	7	-	15	-	30	
		Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	
		Deck cracking	a	5	CFR	59.1	Pos.	22,500	1,329,800	-	-	7	-	15	1,329,800	30	
	06	Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	
		Rebar exposure	a	5	Patching	11.4	m <sup>2</sup>	17,500	199,500	-	-	7	-	15	-	30	
		Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	
	07	Deck cracking	a	5	CFR	59.1	Pos.	22,500	1,329,800	-	-	7	-	15	1,329,800	30	
		Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	
		Rebar exposure	a	5	Patching	11.4	m <sup>2</sup>	17,500	199,500	-	-	7	-	15	-	30	
	08	Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	
		Deck cracking	a	5	CFR	59.1	Pos.	22,500	1,329,800	-	-	7	-	15	1,329,800	30	
		Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	
	09	Rebar exposure	a	5	Patching	11.4	m <sup>2</sup>	17,500	199,500	-	-	7	-	15	-	30	
		Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	
		Deck cracking	a	5	CFR	59.1	Pos.	22,500	1,329,800	-	-	7	-	15	1,329,800	30	
	10	Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	
		Rebar exposure	a	5	Patching	11.4	m <sup>2</sup>	17,500	199,500	-	-	7	-	15	-	30	
		Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	
	11	Deck cracking	a	5	CFR	59.1	Pos.	22,500	1,329,800	-	-	7	-	15	1,329,800	30	
		Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	
		Rebar exposure	a	5	Patching	11.4	m	17,500	199,500	-	-	7	-	15	-	30	
	12	Pop-outs	a	5	Patching & CFR	-	m	10,000	-	-	-	-	-	-	-	-	
		Deck cracking	a	5	CFR	59.1	m	22,500	1,329,800	-	-	7	-	15	1,329,800	30	
		Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	m	45,000	-	-	-	-	-	-	-	-	
	13	Rebar exposure	a	5	Patching	11.4	m	17,500	199,500	-	-	7	-	15	-	30	
		Pop-outs	a	5	Patching & CFR	-	m	10,000	-	-	-	-	-	-	-	-	
		Deck cracking	c	3	CFR	59.1	m	22,500	1,329,800	-	1,329,800	7	-	15	1,329,800	30	
	Substructure	01	Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	m	45,000	-	-	-	-	-	-	-	-
			Cracking etc.	c	3	Resin injection	5.54	m	5,000	27,700	-	27,700	7	-	15	-	30
			Rebar exposure	a	5	Patching	2.24	m	17,500	39,200	-	-	7	-	15	39,200	30
	02	Damages in substructures	a	5	Foot protection	-	m	1,750,000	-	-	-	-	-	-	-	-	
		Cracking etc.	c	3	Resin injection	5.54	m	5,000	27,700	-	27,700	7	-	15	-	30	
		Rebar exposure	a	5	Patching	2.24	m	17,500	39,200	-	-	7	-	15	39,200	30	
	Bearings	101	Bi-functional damage of Bearings	a	5	Metal spraying	1.0	Pos.	120,000	120,000	-	-	7	-	15	120,000	30
		102	Bi-functional damage of Bearings	a	5	Metal spraying	1.0	Pos.	120,000	120,000	-	-	7	-	15	120,000	30
		201	Bi-functional damage of Bearings	a	5	Metal spraying	1.0	Pos.	120,000	120,000	-	-	7	-	15	120,000	30
202		Bi-functional damage of Bearings	a	5	Metal spraying	1.0	Pos.	120,000	120,000	-	-	7	-	15	120,000	30	
Road surface	01	Level differences of road surface	a	5	Pavement replacement	738.4	m <sup>2</sup>	5,000	3,691,900	-	-	5	-	10	3,691,900	20	
Barriers	01	Damages in barriers	a	5	Patching	4.96	m <sup>2</sup>	17,500	86,800	-	-	7	-	15	86,800	30	
	02	Damages in barriers	a	5	Patching	4.96	m <sup>2</sup>	17,500	86,800	-	-	7	-	15	86,800	30	
	03	-	-	-	Patching	4.96	m <sup>2</sup>	17,500	86,800	-	-	7	-	15	86,800	30	
	04	-	-	-	Patching	4.96	m <sup>2</sup>	17,500	86,800	-	-	7	-	15	86,800	30	
Expansion joints	01	Damages in expansion joints	a	5	change of steel exp.	17.8	m	133,400	2,374,600	-	-	7	-	15	2,374,600	30	
	02	Damages in expansion joints	-	-	change of steel exp.	17.8	m	133,400	2,374,600	-	-	7	-	15	2,374,600	30	



Damage classification of members

Bridge name		006Memorial										Span No.					3	
		Damages of steel members				Damages of concrete members					Others							
		Corrosion	Cracking	Missing bolts	Fracture	Cracking, Water leakage, Free lime	No.	Rebar exposure	Pop-outs	Deck cracking	Damages at anchorage of PC tender	Level difference of road surface	Functional damage of bearings	Damages in substructures	Damages in pavements	Damages in expansion joints	Damages in cable	Remarks
Upper chord member	01	a	a	a	a													
	02	a	a	a	a													
Bottom chord member	01	b	a	e	a													
	02	b	a	e	a													
Diagonal	01	a	a	a	a													
	02	a	a	a	a													
Vertical member	01	a	a	a	a													
	02	a	a	c	a													
Lateral bracing (Upper)	01	a	a	a	a													
	02	a	a	a	a													
Lateral bracing (Lower)	01	a	a	a	a													
	02	a	a	a	a													
Sway bracing (Upper)	01	a	a	a	a													
Stringer	01	a	a	a	a													
	02	a	a	a	a													
	03	a	a	a	a													
	04	a	a	a	a													
	05	a	a	a	a													
	06	a	a	a	a													
	07	a	a	a	a													
	08	a	a	a	a													
	09	a	a	a	a													
	10	a	a	a	a													
Floor beam	01	a	a	a	a													
	02	a	a	a	a													
	03	a	a	a	a													
Sway bracing (Lower)	01	b	a	a	a													
Sway bracing (Lower)	01							a	a	c	a							
	02							a	a	a	a							
	03							a	a	a	a							
	04							a	a	a	a							
	05							a	a	a	a							
	06							a	a	a	a							
	07							a	a	a	a							
	08							a	a	a	a							
	09							a	a	a	a							
	10							a	a	a	a							
	11							a	a	a	a							
	12							a	a	a	a							
	13							a	a	c	a							
Pier	01					c	-	a						a				
	02					a	-	a						a				
Bearings	101												a					
	102												a					
	201												a					
	202												a					
Road surface											a			a				
Barriers Railings	01																a	
	02																a	
Expansion joints	01																	a
	02																	a

Estimation of repair quantity

Bridge name		006Memorial			Span No.		3		
Subject			Quantity		Remarks				
1	Span length		80.054 m		Length of 1 span				
2	Road width for pavement		10.6 m		Width for pavement area (Vehicle lane)				
3	Total road width		17.8 m		Deck width				
4	Area of bridge surface		1,425.0 m <sup>2</sup>		Span length x Total width				
5	Area of pavement		848.6 m <sup>2</sup>		Span length x Width for pavement				
6	Barriers & railings		01	concrete	Type of barriers & railings				
			02	concrete	Same as above				
			03	-	Same as above				
			04	-	Same as above				
7	Expansion joints		01	steel	Type of expansion joint				
			02	steel	Same as above				
8	Painting area		Total %	Number of members	Member %	Painting area	Remarks		
	Total painting area		100.0%	1	-	6,300.0 m <sup>2</sup>			
	Main structure	52.0%	Upper chord	65.0%	33.8%	2	16.9%	1,070.0 m <sup>2</sup>	Experience value
			Bottom chord	35.0%	18.2%	2	9.1%	580.0 m <sup>2</sup>	Experience value
	Sway bracing Lateral bracing Portal frame	18.0%	Diagonal	20.0%	3.6%	2	1.8%	120.0 m <sup>2</sup>	Experience value
			Vertical member	15.0%	2.7%	2	1.4%	90.0 m <sup>2</sup>	Experience value
			Latral bracing (Upper)	20.0%	3.6%	2	1.8%	120.0 m <sup>2</sup>	Experience value
			Latral bracing (Lower)	15.0%	2.7%	2	1.4%	90.0 m <sup>2</sup>	Experience value
			Sway bracing (Upper)	15.0%	2.7%	1	2.7%	180.0 m <sup>2</sup>	Experience value
			Sway bracing (Lower)	15.0%	2.7%	1	2.7%	180.0 m <sup>2</sup>	Experience value
	Floor system	32.0%	Stringer	60.0%	19.2%	10	1.9%	130.0 m <sup>2</sup>	Experience value
			Floor beam	40.0%	12.8%	15%	1.9%	130.0 m <sup>2</sup>	End floor beam(15% pos. )
70%						9.0%	570.0 m <sup>2</sup>	Interm. floor beam(70% for all)	
9	Repaired area of deck		Quantity		Remarks				
	Divided area A		109.6 m <sup>2</sup>		13 div. Area of bridge surface / number of division				
	Area of rebar exposure		13.2 m <sup>2</sup>		A x 0.120				
	Area of deck cracking		68.0 m <sup>3</sup>		A x 0.620				
10	Repair quantity of substructure		Quantity		Remarks				
	Cracking, Water leakage, Free lime		5.54 m		per substructure				
	Rebar exposure		2.24 m <sup>2</sup>		per substructure				
11	Concrete barrier		Quantity		Remarks				
	Rebar exposure		5.70 m <sup>2</sup>		A of bridge surf. x 0.004				



Countermeasure classification of members

Bridge name		006Memorial				Span No.			3			
Member	No.	Damage	Damage classification		Countermeasure classification	Member	No.	Damage	Damage classification		Countermeasure classification	
			Classification	Judge					Classification	Judge		
Upper chord	01	Corrosion	a	-	5	Sway bracing (Upper)	01	Corrosion	a	-	5	
		Cracking	a	-	5			Cracking	a	-	5	
		Missing bolts	a	-	5			Missing bolts	a	-	5	
		Fracture	a	-	5			Fracture	a	-	5	
	02	Corrosion	a	-	5		01	Corrosion	a	-	5	
		Cracking	a	-	5			Cracking	a	-	5	
		Missing bolts	a	-	5			Missing bolts	a	-	5	
		Fracture	a	-	5			Fracture	a	-	5	
Bottom chord	01	Corrosion	b	-	4		Stringer	02	Corrosion	a	-	5
		Cracking	a	-	5				Cracking	a	-	5
		Missing bolts	e	-	2				Missing bolts	a	-	5
		Fracture	a	-	5				Fracture	a	-	5
	02	Corrosion	b	-	4			03	Corrosion	a	-	5
		Cracking	a	-	5				Cracking	a	-	5
		Missing bolts	e	-	2				Missing bolts	a	-	5
		Fracture	a	-	5				Fracture	a	-	5
Diagonal	01	Corrosion	a	-	5	04		Corrosion	a	-	5	
		Cracking	a	-	5			Cracking	a	-	5	
		Missing bolts	a	-	5			Missing bolts	a	-	5	
		Fracture	a	-	5			Fracture	a	-	5	
	02	Corrosion	a	-	5	05		Corrosion	a	-	5	
		Cracking	a	-	5			Cracking	a	-	5	
		Missing bolts	a	-	5			Missing bolts	a	-	5	
		Fracture	a	-	5			Fracture	a	-	5	
Vertical member	01	Corrosion	a	-	5	06	Corrosion	a	-	5		
		Cracking	a	-	5		Cracking	a	-	5		
		Missing bolts	a	-	5		Missing bolts	a	-	5		
		Fracture	a	-	5		Fracture	a	-	5		
	02	Corrosion	a	-	5	07	Corrosion	a	-	5		
		Cracking	a	-	5		Cracking	a	-	5		
		Missing bolts	e	-	2		Missing bolts	a	-	5		
		Fracture	a	-	5		Fracture	a	-	5		
Lateral bracing (Upper)	01	Corrosion	a	-	5	08	Corrosion	a	-	5		
		Cracking	a	-	5		Cracking	a	-	5		
		Missing bolts	a	-	5		Missing bolts	a	-	5		
		Fracture	a	-	5		Fracture	a	-	5		
	02	Corrosion	a	-	5	09	Corrosion	a	-	5		
		Cracking	a	-	5		Cracking	a	-	5		
		Missing bolts	a	-	5		Missing bolts	a	-	5		
		Fracture	a	-	5		Fracture	a	-	5		
Lateral bracing (Lower)	01	Corrosion	a	-	5	10	Corrosion	a	-	5		
		Cracking	a	-	5		Cracking	a	-	5		
		Missing bolts	a	-	5		Missing bolts	a	-	5		
		Fracture	a	-	5		Fracture	a	-	5		
	02	Corrosion	a	-	5							
		Cracking	a	-	5							
		Missing bolts	a	-	5							
		Fracture	a	-	5							

Bridge name		006Memorial				Span No.			3			
Member	No.	Damage	Damage classification		Countermeasure classification	Member	No.	Damage	Damage classification		Countermeasure classification	
			Classification	Judge					Classification	Judge		
Floor beam	01	Corrosion	a	-	5	Deck	08	Rebar exposure	a	-	5	
		Cracking	a	-	5			Pop-outs	a	-	5	
		Missing bolts	a	-	5			Deck cracking	a	-	5	
		Fracture	a	-	5			Damages at anchorage of PC tendon	a	-	5	
	02	Corrosion	a	-	5		09	Rebar exposure	a	-	5	
		Cracking	a	-	5			Pop-outs	a	-	5	
		Missing bolts	a	-	5			Deck cracking	a	-	5	
		Fracture	a	-	5			Damages at anchorage of PC tendon	a	-	5	
	03	Corrosion	a	-	5		10	Rebar exposure	a	-	5	
		Cracking	a	-	5			Pop-outs	a	-	5	
		Missing bolts	a	-	5			Deck cracking	a	-	5	
		Fracture	a	-	5			Damages at anchorage of PC tendon	a	-	5	
Sway bracing (Lower)	01	Corrosion	b	-	4		11	Rebar exposure	a	-	5	
		Cracking	a	-	5			Pop-outs	a	-	5	
		Missing bolts	a	-	5			Deck cracking	a	-	5	
		Fracture	a	-	5			Damages at anchorage of PC tendon	a	-	5	
Deck	01	Rebar exposure	a	-	5		12	Rebar exposure	a	-	5	
		Pop-outs	a	-	5			Pop-outs	a	-	5	
		Deck cracking	c	-	3			Deck cracking	a	-	5	
		Damages at anchorage of PC tendon	a	-	5			Damages at anchorage of PC tendon	a	-	5	
	02	Rebar exposure	a	-	5		13	Rebar exposure	a	-	5	
		Pop-outs	a	-	5			Pop-outs	a	-	5	
		Deck cracking	a	-	5			Deck cracking	c	-	3	
		Damages at anchorage of PC tendon	a	-	5			Damages at anchorage of PC tendon	a	-	5	
	03	Rebar exposure	a	-	5	Substructure	01	Cracking etc.	c	-	3	
		Pop-outs	a	-	5		Rebar exposure	a	-	5		
		Deck cracking	a	-	5		Damages in substructures	a	-	5		
		Damages at anchorage of PC tendon	a	-	5		02	Cracking etc.	a	-	5	
	04	Rebar exposure	a	-	5	Bearings	101	Rebar exposure	a	-	5	
		Pop-outs	a	-	5		102	Damages in substructures	a	-	5	
		Deck cracking	a	-	5		201	Functional damage of bearing	a	-	5	
		Damages at anchorage of PC tendon	a	-	5		202	Functional damage of bearing	a	-	5	
	05	Rebar exposure	a	-	5	Road surface	01	Level difference of road surface	a	-	5	
		Pop-outs	a	-	5		Damages in pavements	a	-	5		
		Deck cracking	a	-	5		Barriers	01	Damages in barriers	a	-	5
		Damages at anchorage of PC tendon	a	-	5			02	Damages in barriers	a	-	5
	06	Rebar exposure	a	-	5	03		Damages in barriers	-	-	-	
		Pop-outs	a	-	5	04		Damages in barriers	-	-	-	
		Deck cracking	a	-	5	Expansion joints	01	Damages in expansion joints	a	-	5	
		Damages at anchorage of PC tendon	a	-	5		02	Damages in expansion joints	a	-	5	
	07	Rebar exposure	a	-	5							
		Pop-outs	a	-	5							
		Deck cracking	a	-	5							
		Damages at anchorage of PC tendon	a	-	5							

Approximate repair price for countermeasures

Bridge name		006Memorial				Span No		3				countermeasure classification		countermeasure classification		Planned repair & reconstruction	
Member	No.	Damage	Damage classification	Countermeasure classification	Repair method	Repair quantity	Unit	Approximate unit price (¥)	Approximate repair price (¥)	Approximate repair price for countermeasure classification 1 & 2 (¥)	Repair price (B)	Remaining years up to countermeasure cl 2	Repair price (B)	Remaining years up to countermeasure cl 2	Repair price (B)	Life cycle	
Upper chord	01	Corrosion	a	5	Repainting	1,070.0	m <sup>2</sup>	3,500	3,745,000	-	-	5	-	10	3,745,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	-
	02	Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
		Corrosion	a	5	Repainting	1,070.0	m <sup>2</sup>	3,500	3,745,000	-	-	5	-	10	3,745,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
	Bottom chord	01	Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-
			Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-
			Corrosion	b	4	Repainting	580.0	m <sup>2</sup>	3,500	2,030,000	-	-	5	2,030,000	10	2,030,000	20
02		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
		Missing bolts	a	5	Bolt change for splice pt.	1.0	Pos.	133,400	133,400	133,400	-	-	-	-	-	-	-
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
Diagonal		01	Corrosion	a	5	Repainting	120.0	m <sup>2</sup>	3,500	420,000	-	-	5	-	10	420,000	20
			Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-
			Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-
	02	Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	-
		Corrosion	b	4	Repainting	580.0	m <sup>2</sup>	3,500	2,030,000	-	-	5	2,030,000	10	2,030,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
	Vertical member	01	Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-
			Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-
			Corrosion	a	5	Repainting	90.0	m <sup>2</sup>	3,500	315,000	-	-	5	-	10	315,000	20
02		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	
Lateral bracing		01	Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-
			Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-
			Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-
	02	Corrosion	a	5	Repainting	120.0	m <sup>2</sup>	3,500	420,000	-	-	5	-	10	420,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
	Lateral bracing (Lower)	01	Fracture	a	5	Reinf. for fracture	1.0	Pos.	133,400	133,400	133,400	-	-	-	-	-	-
			Corrosion	a	5	Repainting	120.0	m <sup>2</sup>	3,500	420,000	-	-	5	-	10	420,000	20
			Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	
02		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Corrosion	a	5	Repainting	130.0	m <sup>2</sup>	3,500	455,000	-	-	5	-	10	455,000	20	
Sway bracing (Upper)		01	Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-
			Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-
			Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	
	02	Corrosion	a	5	Repainting	180.0	m <sup>2</sup>	3,500	630,000	-	-	5	-	10	630,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
	Stringer	01	Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-
			Corrosion	a	5	Repainting	130.0	m <sup>2</sup>	3,500	455,000	-	-	5	-	10	455,000	20
			Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	
02		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Corrosion	a	5	Repainting	130.0	m <sup>2</sup>	3,500	455,000	-	-	5	-	10	455,000	20	
03		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-	
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-	
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-		
04	Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-	-		
	Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-	-		
	Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-			
Stringer	05	Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-		
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-		
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-		
	06	Corrosion	a	5	Repainting	130.0	m <sup>2</sup>	3,500	455,000	-	-	5	-	10	455,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-		
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-		
	07	Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-		
		Corrosion	a	5	Repainting	130.0	m <sup>2</sup>	3,500	455,000	-	-	5	-	10	455,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-		
08	Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-			
	Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-			
	Corrosion	a	5	Repainting	130.0	m <sup>2</sup>	3,500	455,000	-	-	5	-	10	455,000	20		
09	Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-			
	Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-			
	Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-			
10	Corrosion	a	5	Repainting	130.0	m <sup>2</sup>	3,500	455,000	-	-	5	-	10	455,000	20		
	Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-			
	Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-			
Floor beam	01	Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-		
		Corrosion	a	5	Repainting	130.0	m <sup>2</sup>	3,500	455,000	-	-	5	-	10	455,000	20	
		Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-			
Floor beam	02	Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-		
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-		
		Corrosion	a	5	Repainting	570.0	m <sup>2</sup>	3,500	1,995,000	-	-	5	-	10	1,995,000	20	
03	Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-			
	Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-			
	Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-			
Sway bracing (Lower)	01	Cracking	a	5	Reinf. with steel pt.	-	Pos.	166,700	-	-	-	-	-	-	-		
		Missing bolts	a	5	Bolt change for splice pt.	-	Pos.	133,400	-	-	-	-	-	-	-		
		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-	-	-	-	-	-	-		

Member	No.	Damage	Damage classification	Countermeasure classification	Repair method	Repair quantity	Unit	Approximate unit price (A)	Approximate repair price (B)	Approximate repair price for countermeasure classification 1 & 2 (B)	countermeasure classification 3		countermeasure classification 4		Planned repair & reconstruction		
											Repair price (B)	Remaining years up to countermeasure cl 2	Repair price (B)	Remaining years up to countermeasure cl 2	Repair price (B)	Life cycle	
Deck	01	Rebar exposure	a	5	Patching	13.2	m <sup>2</sup>	17,500	231,000	-	-	7	-	15	-	30	
		Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	-
		Deck cracking	c	3	CFR	68.0	m <sup>2</sup>	22,500	1,530,000	-	1,530,000	7	-	15	1,530,000	30	
	02	Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	-
		Rebar exposure	a	5	Patching	13.2	m <sup>2</sup>	17,500	231,000	-	-	7	-	15	-	30	
		Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	-
	03	Deck cracking	a	5	CFR	68.0	m <sup>2</sup>	22,500	1,530,000	-	-	7	-	15	1,530,000	30	
		Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	-
		Rebar exposure	a	5	Patching	13.2	m <sup>2</sup>	17,500	231,000	-	-	7	-	15	-	30	
	04	Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	-
		Deck cracking	a	5	CFR	68.0	Pos.	22,500	1,530,000	-	-	7	-	15	1,530,000	30	
		Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	-
	05	Rebar exposure	a	5	Patching	13.2	m <sup>2</sup>	17,500	231,000	-	-	7	-	15	-	30	
		Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	-
		Deck cracking	a	5	CFR	68.0	Pos.	22,500	1,530,000	-	-	7	-	15	1,530,000	30	
	06	Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	-
		Rebar exposure	a	5	Patching	13.2	m <sup>2</sup>	17,500	231,000	-	-	7	-	15	-	30	
		Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	-
	07	Deck cracking	a	5	CFR	68.0	Pos.	22,500	1,530,000	-	-	7	-	15	1,530,000	30	
		Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	-
		Rebar exposure	a	5	Patching	13.2	m <sup>2</sup>	17,500	231,000	-	-	7	-	15	-	30	
	08	Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	-
		Deck cracking	a	5	CFR	68.0	Pos.	22,500	1,530,000	-	-	7	-	15	1,530,000	30	
		Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	-
	09	Rebar exposure	a	5	Patching	13.2	m <sup>2</sup>	17,500	231,000	-	-	7	-	15	-	30	
		Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	-
		Deck cracking	a	5	CFR	68.0	Pos.	22,500	1,530,000	-	-	7	-	15	1,530,000	30	
	10	Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	-
		Rebar exposure	a	5	Patching	13.2	m <sup>2</sup>	17,500	231,000	-	-	7	-	15	-	30	
		Pop-outs	a	5	Patching & CFR	-	Pos.	10,000	-	-	-	-	-	-	-	-	-
	11	Deck cracking	a	5	CFR	68.0	Pos.	22,500	1,530,000	-	-	7	-	15	1,530,000	30	
		Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-	-	-	-	-	-	-	-	-
		Rebar exposure	a	5	Patching	13.2	m	17,500	231,000	-	-	7	-	15	-	30	
	12	Pop-outs	a	5	Patching & CFR	-	m	10,000	-	-	-	-	-	-	-	-	-
		Deck cracking	a	5	CFR	68.0	m	22,500	1,530,000	-	-	7	-	15	1,530,000	30	
		Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	m	45,000	-	-	-	-	-	-	-	-	-
	13	Rebar exposure	a	5	Patching	13.2	m	17,500	231,000	-	-	7	-	15	-	30	
		Pop-outs	a	5	Patching & CFR	-	m	10,000	-	-	-	-	-	-	-	-	-
		Deck cracking	c	3	CFR	68.0	m	22,500	1,530,000	-	1,530,000	7	-	15	1,530,000	30	
	Substructure	Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	m	45,000	-	-	-	-	-	-	-	-	-
		Cracking etc.	c	3	Resin injection	5.4	m	5,000	27,000	-	27,000	7	-	15	-	30	
		Rebar exposure	a	5	Patching	2.24	m	17,500	39,200	-	-	7	-	15	39,200	30	
	02	Damages in substructures	a	5	Foot protection	-	m	1,750,000	-	-	-	-	-	-	-	-	-
		Cracking etc.	a	5	Resin injection	5.4	m	5,000	27,000	-	-	7	-	15	-	30	
		Rebar exposure	a	5	Patching	2.24	m	17,500	39,200	-	-	7	-	15	39,200	30	
	Bearings	Damages in substructures	a	5	Foot protection	-	m	1,750,000	-	-	-	-	-	-	-	-	-
		101 Functional damage of bearings	a	5	Metal spraying	1.0	Pos.	120,000	120,000	-	-	7	-	15	120,000	30	
		102 Functional damage of bearings	a	5	Metal spraying	1.0	Pos.	120,000	120,000	-	-	7	-	15	120,000	30	
201 Functional damage of bearings		a	5	Metal spraying	1.0	Pos.	120,000	120,000	-	-	7	-	15	120,000	30		
Road surface	202 Functional damage of bearings	a	5	Metal spraying	1.0	Pos.	120,000	120,000	-	-	7	-	15	120,000	30		
	01 Level difference of road surface	a	5	Pavement replacement	848.6	m <sup>2</sup>	5,000	4,243,000	-	-	5	-	10	4,243,000	20		
Barriers	Damages in pavements	a	5	same as above	848.6	m <sup>2</sup>	5,000	4,243,000	-	-	5	-	10	4,243,000	20		
	01 Damage in barriers	a	5	Patching	5.70	m	17,500	99,800	-	-	7	-	15	99,800	30		
	02 Damage in barriers	a	5	Patching	5.70	m	17,500	99,800	-	-	7	-	15	99,800	30		
	03 -	-	-	Patching	5.70	m	17,500	99,800	-	-	7	-	15	99,800	30		
Expansion joints	04 -	-	-	Patching	5.70	m	17,500	99,800	-	-	7	-	15	99,800	30		
	01 Damages in expansion joints	a	5	change of steel exp.	17.8	m	133,400	2,374,600	-	-	7	-	15	2,374,600	30		
02 Damages in expansion joints	a	5	change of steel exp.	17.8	m	133,400	2,374,600	-	-	7	-	15	2,374,600	30			

Approximate total repair cost

Year	Annual repair cost (B)					Cumulative cost (B)
	Span No.1	Span No.2	Span No.3	Periodic inspection + reserve for unexpected matters	Bridge total	
2011	8,684,484	8,249,937	4,675,084	233,400	21,842,904	21,842,904
2012	-	-	-	-	-	21,842,904
2013	-	-	-	-	-	21,842,904
2014	-	-	-	-	-	21,842,904
2015	-	-	-	-	-	21,842,904
2016	-	-	-	233,400	233,400	22,076,304
2017	-	-	-	-	-	22,076,304
2018	-	2,715,000	-	-	2,715,000	24,791,304
2019	-	-	-	-	-	24,791,304
2020	-	-	-	-	-	24,791,304
2021	10,022,584	10,754,737	12,052,584	233,400	33,063,304	57,854,609
2022	-	-	-	-	-	57,854,609
2023	-	-	-	-	-	57,854,609
2024	-	-	-	-	-	57,854,609
2025	-	-	-	-	-	57,854,609
2026	-	-	-	233,400	233,400	58,088,009
2027	-	-	-	-	-	58,088,009
2028	-	-	-	-	-	58,088,009
2029	-	6,064,737	-	-	6,064,737	64,152,746
2030	-	-	-	-	-	64,152,746
2031	25,099,884	16,861,637	27,312,784	233,400	69,507,704	133,660,450
2032	4,242,900	5,504,737	-	-	9,747,637	143,408,088
2033	-	-	-	-	-	143,408,088
2034	-	-	-	-	-	143,408,088
2035	-	-	-	-	-	143,408,088
2036	-	-	-	233,400	233,400	143,641,488
2037	-	-	-	-	-	143,641,488
2038	-	-	-	-	-	143,641,488
2039	-	-	-	-	-	143,641,488
2040	-	-	-	-	-	143,641,488
2041	22,337,200	17,734,400	22,337,200	233,400	62,642,200	206,283,688
2042	6,934,884	10,754,737	8,964,884	-	26,654,504	232,938,192
2043	-	-	-	-	-	232,938,192
2044	-	-	-	-	-	232,938,192
2045	-	-	-	-	-	232,938,192
2046	-	-	-	233,400	233,400	233,171,592
2047	-	-	-	-	-	233,171,592
2048	-	-	-	-	-	233,171,592
2049	-	2,659,600	-	-	2,659,600	235,831,192
2050	-	6,064,737	-	-	6,064,737	241,895,929
2051	-	-	-	233,400	233,400	242,129,329
2052	28,159,884	16,861,637	30,372,784	-	75,394,304	317,523,634
2053	4,242,900	5,504,737	-	-	9,747,637	327,271,271
2054	-	-	-	-	-	327,271,271
2055	-	-	-	-	-	327,271,271
2056	-	-	-	233,400	233,400	327,504,671
2057	-	-	-	-	-	327,504,671
2058	-	-	-	-	-	327,504,671
2059	-	-	-	-	-	327,504,671
2060	-	-	-	-	-	327,504,671
2061	-	-	-	233,400	233,400	327,738,071
2062	-	-	-	-	-	327,738,071
2063	6,934,884	10,754,737	8,964,884	-	26,654,504	354,392,575
2064	-	-	-	-	-	354,392,575
2065	-	-	-	-	-	354,392,575
2066	-	-	-	233,400	233,400	354,625,975
2067	-	-	-	-	-	354,625,975
2068	-	-	-	-	-	354,625,975
2069	-	-	-	-	-	354,625,975
2070	-	-	-	-	-	354,625,975
2071	-	6,064,737	-	233,400	6,298,137	360,924,112
2072	22,337,200	17,734,400	22,337,200	-	62,408,800	423,332,912
2073	25,099,884	16,861,637	27,312,784	-	69,274,304	492,607,217
2074	4,242,900	5,504,737	-	-	9,747,637	502,354,854
2075	-	-	-	-	-	502,354,854
2076	-	-	-	233,400	233,400	502,588,254
2077	-	-	-	-	-	502,588,254
2078	-	-	-	-	-	502,588,254
2079	-	-	-	-	-	502,588,254
2080	-	2,659,600	-	-	2,659,600	505,247,854
2081	-	-	-	233,400	233,400	505,481,254
2082	-	-	-	-	-	505,481,254
2083	3,060,000	-	3,060,000	-	6,120,000	511,601,254
2084	6,934,884	10,754,737	8,964,884	-	26,654,504	538,255,758
2085	-	-	-	-	-	538,255,758
2086	-	-	-	233,400	233,400	538,489,158
2087	-	-	-	-	-	538,489,158
2088	-	-	-	-	-	538,489,158
2089	-	-	-	-	-	538,489,158
2090	-	-	-	-	-	538,489,158
2091	-	-	-	233,400	233,400	538,722,558
2092	-	6,064,737	-	-	6,064,737	544,787,296
2093	-	-	-	-	-	544,787,296
2094	25,099,884	16,861,637	27,312,784	-	69,274,304	614,061,600
2095	4,242,900	5,504,737	-	-	9,747,637	623,809,237
2096	-	-	-	233,400	233,400	624,042,637
2097	-	-	-	-	-	624,042,637
2098	-	-	-	-	-	624,042,637
2099	-	-	-	-	-	624,042,637
2100	-	-	-	-	-	624,042,637
2101	-	-	-	233,400	233,400	624,276,037
2102	-	-	-	-	-	624,276,037
2103	22,337,200	17,734,400	22,337,200	-	62,408,800	686,684,837
2104	-	-	-	-	-	686,684,837
2105	6,934,884	10,754,737	8,964,884	-	26,654,504	713,339,342
2106	-	-	-	233,400	233,400	713,572,742
2107	-	-	-	-	-	713,572,742
2108	-	-	-	-	-	713,572,742
2109	-	-	-	-	-	713,572,742
2110	-	-	-	-	-	713,572,742

Estimation of LCC

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Memorial

