# 1.5.11 IRR North

Inspecton resul	lt	_													Span N	0.		1
		Dama	iges of s	teel me	mbers		Damag	sofco	ncrete n	nembers				Oti	iers			
		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 pavennents	Damages in expansion joints	Damages in cable	Remarks
	01					a		а		H	a		<u> </u>					
Girder	02					a		a			а						a sangal sanga	
	03					a		а		0	a				- And			
	01					a		a			а							
Crossbeam	02					a		a			a							
	03					a		а	10		a							
Deck	01	Sector street	-			and the second second		a	a	с								
Deck	02	L de la composition de la comp			-	a second second	1t.	a	a	a								
cable	03						1. 	a	a	C			1					
	01						na kanalakan Kanalakan		anteration anter						Contraction of the second		The second s	
Pier	02		All stangers		5	c c	Contraction of a starting of	a a		S. Harrison Balanta Tan Marina	AL INSTRUMENT		ers grappie :	Right Anna 1	and the second			
	01						Consection of the section of the sec	a									as an	
Abuttment	02		Transfer and		Radio and Solar R		2010 (n. 2010) 2010 (n. 2010)		Receiption of			la biser Kill Technic provi		Sind.				
Road surface			1						New Street, or other			a		10.000	A CONTRACTOR OF THE OWNER OF THE			
Pavement			1.1.1											19	a		an ann an th	
	01		1			C. Sec.	Res Mary Provi									a		······································
Barriers	02															a		· · · · · · · · · · · · · · · · · · ·
Railings	03			an jaran kerint	Contraction of the		Contraction of the	and a second	Subsection Spectra							a		
	04						C. Laboratoria									a		
Expansion joints	01																a	т

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## Estimation of repair quantity

	Imation of repair quantit	<u>y</u>	IRR North	Span No. 1
	Subject	T	Quantity	Remarks
1	Span length		50.63 m	Length of 1 span
2	Road width for pavement		29.00 m	Width for pavement area (Vehicle lane)
3	Total road width		35.80 m	Deck width
4	Area of bridge surface		1,812.6 m <sup>2</sup>	Span length x Total width
	Area of pavement		1,468.3 m <sup>2</sup>	Span length x Width for pavement
	F	01	concrete	Type of barriers & railings
	и. - С	02	concrete	Same as above
6	Barriers & railings	03	concrete	Same as above
		04	concrete	Same as above
		01	steel	Type of expansion joint
7	Expansion joints	-	-	Same as above
	Crack length	L	Quantity	Remarks
	Total crack length	L	72.5 m	A of bridge surf. x $0.040$
		01	7.3 m	$L \times 0.100$ assumed as 10%
_	Girder	02	43.5 m	$L \times 0.600$ assumed as 60%
8		03	7.3 m	$L \times 0.100$ assumed as 10%
		01	2.2 m	$L \times 0.030$ assumed as 3%
	Crossbeam	02	10.2 m	$L \times 0.140$ assumed as 14%
		03	2.2 m	$L \times 0.030$ assumed as 3%
	Area of rebarb exposure		Quantity	Remarks
	Total area	A	$14.5 m^2$	A of bridge surf. x 0.008
		01	$1.5 m^2$	$L \times 0.100$ assumed as 10%
•	Girder	02	8.7 m <sup>2</sup>	$L \times 0.600$ assumed as 60%
9		03	1.5 m <sup>2</sup>	$L \times 0.100$ assumed as 10%
	N 1	01	0.4 m <sup>2</sup>	$L \times 0.030$ assumed as 3%
	Crossbeam	02	2.0 m <sup>2</sup>	$L \times 0.140$ assumed as 14%
		03	0.4 m <sup>2</sup>	$L \times 0.030$ assumed as 3%
	Repaired area of deck		Quantity	Remarks
10	Divided area	A	$425.3 m^2$	Deck width = 8.4 m Deck width for pos. x span length
10	Area of rebarb e	xposure	51.0 m <sup>2</sup>	A × 0.120
	Area of deck cra	icking	$263.7 m^2$	$A \times 0.620$
	Repair quanity of pylon & subst	ructure	Quantity	Remarks
11	Cracking, Water leakage, I	Free lime	5.54 m	per substructure
	Rebar exposure	· · · ·	$2.24 m^2$	per substructure
10	Concrete barrier		Quantity	Remarks
12	Rebar exposure		7.25 m <sup>2</sup>	A of bridge surf. x 0.004

Counterme	asu	e classification of members	r			Bridge name	-	IRR North	Spar	1 No.	1
				nage ication	رە					nage ication	0
Member.	No.	Damage	Classification	Judge	Countermeasure classification	Member	No.	Damage	Classification	Judge	Countermeasure
		Cracking, Water leakage, Free lime	a	- '	5			Rebar exposure	a		5
	01	Rebar exposure	a	-	5		01	Pop-outs	a	-	5
		Damages at anchorage of PC tendon	а	-	5			Deck cracking	С	-	3
		Cracking, Water leakage, Free lime	а		5			Rebar exposure	а		5
Girder	02	Rebar exposure	а	-	5	Deck		Pop-outs	а	-	5
		Damages at anchorage of PC tendon	а	-	5	1		Deck cracking	а	-	5 .
		Cracking, Water leakage, Free lime	а	-	5			Rebar exposure	a	-	5
	03	Rebar exposure	а	-	5		03	Pop-outs	a	·	5
		Damages at anchorage of PC tendon	a	-	5			Deck cracking	e	-	3
		Cracking, Water leakage, Free lime	а		5			Cracking, Water leakage, Free lime	С	-	3
		Rebar exposure	а	-	5		01	Rebar exposure	a	-	5
		Damages at anchorage of PC tendon	а	-	5	Substructure		Damages in substructures	а	-	5
	1	Cracking, Water leakage, Free lime	а	-	5	Substructure		Cracking, Water leakage, Free lime	с		3
Crossbeam	02	Rebar exposure	a	-	5	•	02	Rebar exposure	а	-	5
		Damages at anchorage of PC tendon	a	-	5			Damages in substructures	а	-	5
		Cracking, Water leakage, Free lime	a	÷ 1	5	Road surface	01	Level difference of road surface	а	-	5
	03	Rebar exposure	а	-	5	Road surface	01	Damages in pavemnents	a	-	5
		Damages at anchorage of PC tendon	a	-	5		01	Damages in barriers	a	-	5
						Barriers	02	Damages in barriers	a	-	5
						Railings	03	Damages in barriers	а	-	5
							04	Damages in barriers	а	-	5
						Expansion joints	01	Damages in expansion joints	a	-	5

Approximate re	Approximate repair price for countermeasure								-						
Bridge name		IRR North			Span No	No.	1								2
		ųc							Approximate	countermeasure classification 3	sure n.3	countermeasure classification 4	aure n 4	Planned repair & reconstruction	& D
Member	No.	iteofisssificatic termeasure	noites î.	Repair method	Repair quantity	Curit	Approximate unit price (B)	Approximate repair price (B)	repair price for countermeasure classification 1 & 2 (D)	Repár price (B)	Remaini ng years up to counter	Repair price (B)	Remaini ng years up to counter	Reptin proce (B)	Life cycle
									þ		cl. 2		ol. 2		
			5	Resin injection	7.3	Ħ	5,000	36,500	1	-	2	1	15	-	8
	01 Rebar exposure	-	+	Patching	1.5.	"E,	17,500	26,300	1	1	~	-	15	26,300	8
	Damages at anchorage of PC tendon		-	Reinforcement with external PC tendon	7 2 27	Pos.	1,000,000	- 003 E10	'	'	1	'	• <u>•</u>	1	. 5
Girder	Cracking/Water leakage/Free lime ; 02 Rehamerthosine		~ ~	Kesm injection Patching	8.7	E 7	17.500	152.300	, ,		~ ~	i t	C 2	- 152300	200
		╀	+	Reinforcement with external PC tendon		Pos	1.000.000			1	•		'		[ '
	Cracking/Water leakage/Free lime			Resin injection	7.3	E	5,000	36,500	1		7	1	15	•	30
	03 Rebar exposure			Patching	. 1.5	т <sup>2</sup>	17,500	26,300	,	1	7	1	15	26,300	30
	Damages at anchorage of PC tendon	е 7		Reinforcement with external PC tendon	1	Pos.	1,000,000	•	,	t	'	1	1		•
	-	e1	5	Resin injection	2.2	E	5,000	11,000		t	2	1	15	1	ŝ
	01 Rebar exposure	4		Patching	0.4	<sup>-</sup> ۳	17,500	7,000	1.	Ŧ	7	1	15	7,000	8
	Damages at anchorage of PC tendon	+	-	Reinforcement with external PC tendon		Pos.	1,000,000		'	1	;;;;	ł,	1	'	· [
		+	5	Resin injection	10.2	E	5,000	51,000	'	'		'	15		2
Crossbeam	02 Rebar exposure	-		Patching	2.0	, ۳	17,500	35,000	-	-	-	-	2	33,000	9
- 2	Damages at anchorage of PC tendon	-+-	+	Reinforcement with external PC tendon		Pos.	1,000,000		•	•	•		•	•	' (
	_		2	Resin injection	2.2	н	5,000	11,000	'	-		-	<u>.</u>		2
2 -	03 Rebar exposure	-		Patching	0.4		17,500	7,000	I	1	7	'	15	1,000	8
•	Damages at anchorage of PC tendon	-+-		Reinforcement with external PC tendon	- C	Pos.	1,000,000	- 000			' '	1	•	'	1
:	Kebar exposure	-	0.4	Patching Batching Batching	0.16	, B D	10.000	000'769		•		'	2	-	3
			n m	L availing to OLIN CHR	263.7	1 <sup>7</sup>	22,500	5,933,300		5,933,300	12		25	5,933,300	20%
<u> </u>	Rebar exposure	с, с,	2	Patching	51.0	2 <sup>7</sup> E	17,500	892,500			2	1	15	1	30
Deck	02 Pop-outs		5	Patching & CFR	,	Pos.	10,000	1	1		•	•	•	1	1
	Deck cracking	a 5	5	CFR	263.7	m2	22,500	5,933,300	1	-	12	-	25	5,933,300	50
		8	5	Patching	51.0	m2	17,500	892,500	-		7	1	15	1	30
	03 Pop-outs	8		Patching & CFR	1	Pos.	10,000		1		'	,	,	1 0.15 000000000000000000000000000000000	'
	Deck cracking	+		CFR	263.7	ш <sup>2</sup>	22,500	5,933,300	-	5,933,300	12	1	52	5,933,300	28
	Ol IB-k	-		Detablish	4C.C	E F	000,0	100,12	1	101.12	` <sup>_</sup>	1	CI 21	- 000 08	n N
	Dominantin militari			Townshine	1	Dier / nulon	000'11	004500			Ī		-	nort on a	3
Substructure	Conditional action to the former of the second seco	+		r oot protection Resin injection	45.5	morfed a set t	5 000	002.22		002.22	6	-	1		6
	()? Rehar extrastite	╋		Patching	2.24	1 1	17,500	39,200	1	-		1	15	39.200	00
	<i>a</i>	╋	2 5	Foot protection	1	Pier / pylon	1.750,000	1		-		'	'		1
-	1		5 P	Pavement replacement	•	- <sup>2</sup>	5,000		 	1	5	'	10	'	20
Koad surface	01 Damages in pavenments		5	same as above	1,468.3	н <sup>2</sup> н	5,000	7,341,400	'		5		10	7,341,400	20
	01 Damages in barriers	47) 10	5	Patching.	7.25	a,	120,000	870,000	1	+	7	1	15	870,000	30
L	02 Damages in barriers	a	5	Patching.	7.25	"	120,000	870,000	'	-	7	•	15	870,000	30
	03 Damages in barriers	a 2	5	Patching.	7.25	п	120,000	870,000	-	-	7	1	15	870,000	30
L	04 Damages in barriers	a 5	5	Patching.	7.25	IJ	120,000	870,000	,	'	7	-	15 📃	870,000	30
sion	01 Damages in expansion joints	67 41	5	change of steel exp.	35.8	в	5,000	179,000		•	2	1	15	000, 671	30
lionts		-												「「「」」によりまた中心の新聞の	1

Inspecton resul	lt														Span N	lo.		2
	-	Dam	ages of	steel me	mbers		Damag	es of co	ncrete n	nembers	;			Ot	hers			ميرون بيرون المرجع المرجع المرجع المرجع
		Corrosion	Cracking	Missing bolts	Fracture	Cracking, Water Jeakage, Free lime	No.	Rebar exposure	Pop-outs	Deck cracking	Damages at anchorage of PC tender	evel difference of road surface	Tunctional damage of bearings	Damages in substructures	Damages in pavemnents	Damages in expansion joints	Damages in cable	Remarks
	01					a	4	a	<u> </u>		a	<u>_</u>	<u>ц</u>		<b>_</b>			Ř
Girder	02					а		a	Print		a				en in the second	a and a second se	na ann an Anna an Anna Anna Anna Anna A	
	03					а		a		in the second	a				1			
	01					а		а			а		- the second					
Crossbeam	02					а		a			а					e son an	contraction of the	
	03	yr 4 (				a		а			а							
<b>n</b> 1	01	NUMBER OF STREET			P. Cont.	F.		a	а	a					and the second		and the second	
Deck	02							a	а	а								
	03							а	а	а								
cable	01		a da subiciona de la			ń., 19												
Pier	01				624	С		a		or such	1997) 1997) 1997)							
Road surface			G. Mrs 2016			Barry Press		and supervised			hjudhe dasar	a						
Pavement	01	hi. Antiquitation				224.43			2 1						a			
Barriers	01				t eif	<u> 30.000</u>										а		
				Clark						( Princip						а		
Railings	03															a		
	04	A MARKEN AND	Waller A. S.	C. Children	1.1 10.1	CALL NO.							in Aligned			а		

Estimation	of	repair	quantity
Louindation	<b>U</b> .	ropun	quantity

	Imation of repair quantit	,	IRR North	Span No. 2
•	Subject		Quantity	Remarks
1	Span length		74.50 m	Length of 1 span
2	Road width for pavement		29.00 m	Width for pavement area (Vehicle lane)
3	Total road width		35.80 m	Deck width
4	Area of bridge surface		$2,667.1 \text{ m}^2$	Span length x Total width
5	Area of pavement		2,160.5 m <sup>2</sup>	Span length x Width for pavement
		01	concrete	Type of barriers & railings
~		02	concrete	Same as above
6	Barriers & railings	03	concrete	Same as above
		04	concrete	Same as above
	Tourse in ininte	01	steel	Type of expansion joint
7	Expansion joints	-		Same as above
	Crack length		Quantity	Remarks
	Total crack length	L	106.7 m	A of bridge surf. x $0.040$
		01	10.7 m	$L \times 0.100$ assumed as 10%
8	Girder	02	64.0 m	$L \times 0.600$ assumed as 60%
o	· · · · · · · · · · · · · · · · · · ·	03	10.7 m	$L \times 0.100$ assumed as 10%
		01	3.2 m	$L \times 0.030$ assumed as 3%
	Crossbeam	02	14.9 m	$L \times 0.140$ assumed as 14%
		03	3.2 m	$L \times 0.030$ assumed as 3%
	Area of rebarb exposure		Quantity	Remarks
	Total area	A	21.3 m <sup>2</sup>	A of bridge surf. x 0.008
		01	$2.1 m^2$	$L \times 0.100$ assumed as 10%
9	Girder	02	12.8 m <sup>2</sup>	$L \times 0.600$ assumed as 60%
, ,		03	$2.1 m^2$	$L \times 0.100$ assumed as 10%
		01	0.6 m <sup>2</sup>	
	Crossbeam	02	3.0 m <sup>2</sup>	$L \times 0.140$ assumed as 14%
		03	0.6 m <sup>2</sup>	$L \times 0.030$ assumed as 3%
	Repaired area of deck		Quantity	Remarks
10	Divided area	Α	625.8 m <sup>2</sup>	Deck width = 8.4 m Deck width for pos. x span length
10	Area of rebarb e	xposure	$75.1 \text{ m}^2$	A × 0.120
	Area of deck cra	cking	388.0 m <sup>2</sup>	A × 0.620
	Repair quanity of pylon & subst	ructure	Quantity	Remarks
11	Cracking, Water leakage,	Free lime	5.54 m	per substructure
	Rebar exposure		2.24 m <sup>2</sup>	per substructure
10	Concrete barrier		Quantity	Remarks
12	Rebar exposure		10.67 m <sup>2</sup>	A of bridge surf. x 0.004

Counterme	asure	classification of members	T			Bridge name	1	IRR North	Spa	n No.	2
				mage fication					[	nage fication	
Member	No,		Classification	Judge	Countermeasure classification	Member	No.	Damage	Classification	Judge	Countermeasure
		Cracking, Water leakage, Free lime	а	-	5		1	Rebar exposure	a		5
	01	Rebar exposure	а	-	5	1	01	Pop-outs	a		5
		Damages at anchorage of PC tendon	а	-	5	1		Deck cracking	a		5
<u>.</u>		Cracking, Water leakage, Free lime	a	-	5			Rebar exposure	a		5
Girder	02	Rebar exposure	a	-	5	Deck	02	Pop-outs	а	-	5
		Damages at anchorage of PC tendon	a	-	5			Deck cracking	а	-	5
		Cracking, Water leakage, Free lime	a	-	5			Rebar exposure	a	-	5
	03	Rebar exposure	a	-	5		03	Pop-outs	a	- 1	5
		Damages at anchorage of PC tendon	a	-	5			Deck cracking	a	-	5
		Cracking, Water leakage, Free lime	а		5			Cracking, Water leakage, Free lime	c	3	3
	01	Rebar exposure	а	-	5	Substructure	01	Rebar exposure	а	-	5
		Damages at anchorage of PC tendon	а	-	5			Damages in substructures	а	-	5
- ·		Cracking, Water leakage, Free lime	a	-	5	Road surface		Level difference of road surface	a	-	5
Crossbeam	02	Rebar exposure	a	-	5	Road surface	101	Damages in pavemnents	a		5
		Damages at anchorage of PC tendon	a	-	5		01	Damages in barriers	a		5
		Cracking, Water leakage, Free lime	a	-	5	Barriers	02	Damages in barriers	a	-	5
	03	Rebar exposure	а	-	5	Railings	03	Damages in barriers	a	- 1	5
		Damages at anchorage of PC tendon	а	-	5		04	Damages in barriers	a	-	5
						Expansion joints		Damages in expansion joints	a		5

	æ _	orde Socie	8	02	30	30		8	30	- 02	8	·	8	<u>0</u>	' V	8	'	30	1	25	<u>,</u>	2	8	. 6	8	8	·	3	22	2	2	26	3	30	
<ol> <li>M. M. Martin Mathematical Action of the Control of Co</li></ol>	Planned repair & reconstruction	Repair price (B)	T N	36,800	'	224,000	J		36,800	1	10.500			52,500	'	10.500	1	-		8,730,000		8,730,000	1	- 000 002 8	-	39,200	1		10,802,500	1,280,400	1,280,400	1,280,400	1,280,400	179,000	
	<b>5</b> 4	Remaini ng years up to counter measure cl. 2	15	- <u>15</u>	15	15	1	15	15	' '	15	'	15	15	·   -	15	ſ	15		22		25	15	- 36	3 5	15	1	2	10	2	2	<u>, 1</u>	2	15	
	countermeasure classification 4	Repair price (B)	+ 1		•		-	'	1	-		1	1	'	'	1	•	1		'			1	'	1		1	'	•	1	ľ	1	-	L	
	3 3	Remaini ng years up to counter measure cl. 2	7		L	- 1-		7	٢	, t	 -		7	-	' '	~ ~	1	7	'	12		12	7	' -	7	. L	1	5	Ś		-		~	7	
	countermeasure classification 3	Repair price (B)		1 1		,	1	-	1	1	1 1	-	ł	1	-	•	•	l	4	1	1	1	-	1	- 006 26	1 1		1	1	-	-	-	'	-	
	Approximate	repair price for countermeasure dassification 1 & 2 (B)	3	1	' '		•	1	-	'			1	1			1				'	' '	-		'		-	-		-	-	1		'	
		Approximate repair price (B)	53,500	36,800	320.000	774 000	-	53,500	36,800		10,500	-	74,500	52,500	'	16,000	-	1,314,300	1	8,730,000	1,314,300	8.730.000	1,314,300		8,730,000	39,200		1	10,802,500	1,280,400	1,280,400	1,280,400	1,280,400	179,000	
2		Approximate unit price (B)	5,000	1 000 000	5,000	17 500	1,000,000	5,000	17,500	1,000,000	5.000	1,000,000	5,000	17,500	1,000,000	5,000		17,500	10,000	22,500	17,500	22.500	17,500	10,000	22,500	17,500	1,7		5,000	120,000	120,000	120,000	120,000	5,000	
		Unit	E	2 <sup>2</sup> 2	Fos.	E .	Pos.	E	m²	Pos.	в	Pos.	E	m²	Pos.	E	E S	170. E	Pos.	m <sup>2</sup>	"E ,	Pos.	178	Pos.	m <sup>2</sup>	E	Pier / pylon	m <sup>1</sup>	m²	m²	11	"	И	в	
Span No.		Repair quantity	10.7	2.1		04.0	12.0	10.7	2.1		3.2	0.0	14.9	3.0	1	3.2	0,0	75.1	1	388.0	75.1	388.0	75.1	1	388.0	4C.C 4C.C	-		2,160.5	10.67	10.67	10.67	10.67	35.8	
		Repair method	Resin injection	Patching	Reinforcement with external PC tendon	Resin injection	Painforcement with external PC fendion	Regin injection	Patching	Reinforcement with external PC tendon	Resin injection	Patching Reinforcement with external PC tendon	Resin injection	Patching	Reinforcement with external PC tendon	Resin injection		Remotentent with external r C tentuon Patchine	Patching & CFR	CFR	Patching	Patching & CFR	Datchine	Patching & CFR	CFR	Resn Injection	Foot protection	Pavement replacement	same as above	Patching.	Patching.	Patching.	Patching.	change of steel exp.	
IRR North		Sountermeasure lassification		┽┼	-	-		- <b>- -</b>	<b>~</b>	-	$\left  + \right $	ν iv	-	-	5	$\vdash$	-	<u>،</u> ر	+	5	5	Ś	n v	5	5	n u	-	┢	-	2	5	5	5	5	
IRR		roifsoffiszelo ágerne(	n I	翻網	a u	3	ar.	+	59 G				a a	5 C		-		ц В В В В	3 6	<u> </u>	а	9	73 0	5 ed	3	ບ 	77 (T	6	в	8	а	8	a	8	
Approximate repair price for countermeasure		Damage	Contrine Muntar Jack and Russe lime	Cracking/water reaseguated must Rebar exposure	Damages at anchorage of PC tendon	Cracking/Water leakage/Free lime	Rebareoposure	Damages at anchorage of PC tendon	Cracking/water leakage/rice little Rehar eccositie	Damages at anchorage of PC tendon	Cracking/Water leakage/Free lime	Rebar exposure	Lamages at ancrorage of rol tentonia	Clacking watel readective mine Rebar expressive	Damages at anchorage of PC tendon	Cracking/Water leakage/Free lime	Rebar exposure	Damages at anchorage of PC tendon	Don-outs	r op-oue Deck cracking	Rebar exposure	Pop-outs	Leck cracking	Pop-outs	Deck cracking	Cracking/Water leakage/Free lime	kebar exposure Domones in substructures	Level difference of mad surface	Damages in pavements	Pamaes in barriers	Damage	11000	10.2.2	1940.220019	
tte repair j		No		10			8		3	3	-	6		02		<u> </u>	8	+	5	5.		8		8	-		ure u	-	ace 01	5	8	8	2		
Approximate Bridge name	- Anno	Member					Girder							Crossheam		- 2	36					Deck					Substructure		Road surface		Barriers	Railings	) 	Expansion	
- [14	<b>.</b>	<u></u>	<b>4</b> -						-							-															_				

Inspecton result			_								والمتر المتركد المراح				Span 1	No.		3
		Dama	iges of :	steel m	embers	, 	Damage	es of co	ncrete	membe	rs		·····	Ot	hers			
		Corrosion	Cracking	Missing bolts	Fracture	Cracking, Water teakage, Free lime	No.	Rebar exposure	Pop-outs	Deck cracking	Damages at anchorage of PC tender	sevel difference of road surface	Functional damage of bearings	Damages in substructures	Damages in pavennents	Damages in expansion joints	Damages in cable	Remarks
	01	а	a	а	а		•											
Girder	02	a	a	a	а		N. Standard							a a				
	03	а	a	a	а					a d								
	04	а	a	a	a													
Crossbeam	01	а	a	a	a		and the second	0										
Clossoeam	02	a	a	a	а					-								
	01	а	a	a	a	6 N 3		P. 1969					Part Sector	and the state		and a second s		
	01					Had Ligerya	and the other	a a	a	a	a	s			Rep. and and	i in a single		
Deck	03				1990 (an 1997) 1997 (an 1997)	n.p		a	a	a a	a	in an a phy	inter de la composition de la		narrani di li Pengarak			
	04					t possible and a second	and a start of the	a	a	a	a		ette Concession		Alas Marina da Alas		Roman an Ar	
	05			2 Juli - A				a	a	a	a		un de la composition de la composition Composition de la composition de la comp	6.2				
	01		-differences		and a set of the set o	с		a	. 4	4	a			a				
Main tower	02					c	-	а			a			a				· · · · · · · · · · · · · · · · · · ·
	01												а					
cable	02		- 14 - 14 - 14 - 14 - 14 - 14 - 14 - 14						41			140	a	1				
	101			a and a start of the									a					
	102												a					
	103	Partition and											а			2.4		······································
Bearings	104												a					· · · · · · · · · · · · · · · · · · ·
Dournigo	201												a					· · · ·
	202												a					
	203				n an tarta Marina da series								a					ration of the
	204				ul sa								а					
Road surface					64 - 128 17							a						
Pavement		dererder											T.		а			
<b>.</b>	01	1. P.												di a		a		
Barriers	02	<u>x - x</u>														a		
Railings	03															a		
	04						2998 - C.						S BOOKS MIL	1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -		а		

<b>1</b> 11 11 11	· ·	
Estimation	of rengir	anonfify
Listimation	UL FODAIL	quantity

	ge name	r icpair quair		011	IRR N	North			Span No.	3
		Subject			Q	antity			Remarks	
1 5	Span len	gth			32	26.0 m		Length of 1 span		
2 H	Road wi	dth for paven	nent		- 2	29.0 m		Width for pavem	ent area (Vehicle lane)	
3 ]	Fotal roa	ad width			3	35.8 m		Deck width		
4	Area of	bridge surfac	e		11,67	$0.8 m^2$		Span length x To	otal width	
5 /	Area of	pavement			9,45	$54.0 \text{ m}^2$	· ·	Span length x W	idth for pavement	
			(	)1	cc	ncrete		Type of barriers	& railings	
6 1	Downions	& railings	(	)2	c	oncrete		Same as above		
ן א	Darriers	& rannings	(	)3	co	oncrete		Same as above		
			(	)4	cc	ncrete		Same as above		~
7 1	Evnondi	on joints	(	)1		steel		Type of expansion	on joint	
	Expansi	on joints		-				Same as above		
]	Painting	, area	Gird heig	er	umber of embers	Coeffici	ent	Painting area	Remarks	
8	Girder	01~04	3.20	0	1	1.300	)	2,720.0 m <sup>2</sup>		
		01	3.20	0 .	1	1.100	)	260.0 m <sup>2</sup>		
	Crossb eam	02	3.20	0	74	1.100	)	18,660.0 m <sup>2</sup>		
ĺ	Calli	03	3.20	0	1	1.100	) ' '	260.0 m <sup>2</sup>		
	Repaire	d area of decl	k		Qua	ntity			Remarks	
9	Div	ided area	Á		2,3	$34.2 m^2$		5 Division		
"[		Area of reba	rb expo	sure	2	80.1 m <sup>2</sup>	Α	× 0.120		
ſ		Area of deck	c crackij	ng 🐁	1,4	$47.2 m^3$	Α	× 0.620		
	Repair qua	anity of pylon &	substructu	re	Qua	ntity		an a	Remarks	
10	Crac	king, Water leak	age, Free	ime		5.54 m	per	substructure		
	Reba	ar exposure				2.24 m <sup>2</sup>	per	substructure		
11	Concret	e barrier			Qua	intity			Remarks	
	Reb	ar exposure			4	$6.68 m^2$	٨٥	of bridge surf. x 0.004		

Councillea	Suro	Classification of members Bridge name			01100	) NI41-					
		Bridge name				R North		Span No.			3
Member	No.	Damage	class	nage sifica on	Countermeasure classification	Member	No.	Damage	class	nage sifica on	Countermeasure classification
			Class	Judge	Cour				Class	Judge	Cour
		Corrosion	а	-	5			Rebar exposure	a	-	5
	01	Cracking	а	-	5		03	Pop-outs	a	-	5
	01	Missing bolts	а	-	5		05	Deck cracking	а	-	5
		Fracture	a	-	5			Damages at anchorage of PC tendon	a	-	5
· · ·		Corrosion	а	-	5			Rebar exposure	а	-	5
	02	Cracking	а	-	5		04	Pop-outs	а	-	5
	02	Missing bolts	а	-	5	Deck	04	Deck cracking	a	-	5
<b>C</b> . 1		Fracture	а	-	5			Damages at anchorage of PC tendon	а		- 5
Girder		Corrosion	a	-	5			Rebar exposure	a	·	5
		Cracking	a	-	-5			Pop-outs	a		5
	03	Missing bolts	a	-	5		05	Deck cracking			5
		Fracture	a	-	5				a	-	
		A REAL PROPERTY AND A REAL						Damages at anchorage of PC tendon	а		5
			a	-	5		. 01	Cracking, Water leakage, Free lime	¢	3 :	3
	04	Cracking	a	-	5			Rebar exposure	а	-	5
		Missing bolts	a	-	5	Main tower		Damages at anchorage of PC tendon	a		5
		Fracture	a	-	5			Cracking, Water leakage, Free lime	С	-3	3
		Corrosion	а	· _ ·	5			Rebar exposure	а	-	5
	.01	Cracking	a	-	5			Damages at anchorage of PC tendon	a	-	5
		Missing bolts	а	-	5		101	Functional damage of bearings	а	-	5
		Fracture	а	-	5			Functional damage of bearings	a	-	5
		Corrosion	a	· •	5		103	Functional damage of bearings	а	-	5
Crossbeam	02	Cracking	а	-	5	Bearings	104	Functional damage of bearings	а.	-	5
Crossbeam	02	Missing bolts	а	-	5	Dearings	201	Functional damage of bearings	а	-	- 5
		Fracture	a	-	. 5			Functional damage of bearings	а	-	5
		Corrosion	а	-	5			Functional damage of bearings	a	-	5
	0.0	Cracking	a	-	5		204	Functional damage of bearings	a	-	5
	03	Missing bolts	а	-	5	Road	1.1	Level difference of road surface	a	_	5
		Fracture	a	_	5	surface		Damages in pavemnents	 a	-	5
		Rebar exposure	 a	_	5	Surraue		Damages in barriers	a	-	5
		Pop-outs	a		5	Barriers		Damages in barners	a	-	5
	01	Deck cracking	a	-	5	Railings		Damages in barriers			5
		Damages at anchorage of PC tendon			5	Rannigs	03	Domographic bounders	a	-	5
Deck	·		a				04	Damages in barriers	а		
		Rebar exposure	a	-	5						
	02	Pop-outs	a	-	5						
		Deck cracking	a	-	5						
		Damages at anchorage of PC tendon	a	. <del>-</del>	5						

#### Countermeasure classification of members

Bridge name		ice for countermeasures 011IR R No	orth			Span No	<b>5</b> .	3								
											countermeasure ck	stification	countermeasure cl	assification	Planned repai	
Member	No.	Damage	Damage dassification	Countermeasure classification	Repair method	Repair quantity	Unit	Approximate unit price (B)	Approximate repair price (B)	Approximate repair price for countermeasure classification 1 & 2 (B)	Repair price (B)	Remaini ng years up to counter measure cl 2	4 Repair price (B)	Remaini ng years up to counter measure c1 2	reconstructi Repair price (B)	ion Life cyck
		Corrosion	a	5	Repainting	2,720.0	m <sup>2</sup>	3,500	9,520,000	•		5		10	9,520,000	2(
	01	Cracking Missing halfs	a	5	Reinf, with steel pl. Bolt change for splice pl.		Pos. Pos.	166,700			-		· · · · ·			1
		Missing bolts Fracture	a	3	Reinf. for fracture		Pos.	166,700	-				······································			.+
		Compsion	a	5	Repainting	2,720.0	. m²	3,500	9,520,000	-		5		10	9,520,000	2(
	02	Cracking Missing bolts	a a	5	Reinf, with steel pl. Bolt change for splice pl.	<u>:</u>	Pos. Pos.	166,700								+
Girder		Fracture	a	5	Reinf. for fracture	-	Pos.	166,700	-		-			-		1
Girder		Compsion	a	5	Repainting	2,720.0		3,500	9,520,000	· · ·	•	5		. 10	9,520,000	é 24
	03	Cracking Missing bolts	a a	5	Rainf, with steel pl. Bolt change for splice pl.		Pos. Pos.	133,400				<del></del>	·		· · ·	.+
		Fracture	a	5	Reinf. for fracture		Pos.	166,700			-			·		
		Corrosion Cracking	a	5	Repainting Reinf. with steel pl.	2,720.0	m <sup>2</sup> Pos.	3,500	9,520,000	<u> </u>		5		10	9,520,000	20
	04	Missing bolts	a	5	Bolt change for splice pl.		Pos.	133,400								+
		Fracture	а	5	Reinf. for fracture	-	Pos.	166,700		-	-	•		-	•	
		Corrosion Cracking	a a	5	Repainting Roinf, with steel pl.	2,720.0	- m² Pos.	3,500	9,520,000			5		10	9,520,000	20
	01	Missing bolts	a	5	Bolt change for splice pl.	· •	Pos.	133,400		-	-					
		Fracture	a	5	Rainf, for fracture		Pos.	166,700	-					·	•	
		Corrosion Cracking	a	5	Repainting Reinf. with steel pt.	2,720.0	-m² Pos.	3,500	9,520,000			5		10	9,520,000	2
Crossbeam	02	Missing bolts	8	5	Bolt change for splice pl.	-	Pos.	133,400	-	-	-	-		· ·	-	. <u> </u>
	L	Fracture	a	5	Roinf. for fracture	2,720.0	Pos,	166,700	0.620.000					• •	-	
		Corrosión Cracking	a	5	Repainting Reinf, with steel pl.	2,720.0	m² Pos.	3,500	9,520,000	-	<u> </u>	5		10	9,520,000	20
	03	Missing bolts	а	5	Balt change for splice pl.		Pos.	133,400	-	-	-	-		• •		
W b band and	L	Fracture	a	5	Reinf. for fracture	11,670.8	Pos.	166,700	35,012,400						35.012.400	
Work stand w	/orxer	Rebar exposure	a	5	Patching	280.1	m <sup>2</sup>	17,500	4,901,800		-	7		. 15	-	- 3
	01	Pop-outs	a		Packing & CFR		Pos.		-	-		÷ ;				F
		Deckenacking Damages at anchorage of PC tendon	a	5	CFR CFR (upper & bottom)	1,447.2	Pos.	22,500 45,000	32,562,000		<u> </u>	1 -		15	32,562,000	<u>)</u> 34
		Rebar exposure	а	5	Patching	280,1	m <sup>2</sup>	17,500	4,901,800	•	-	7		15	-	- 3
-	02	Pop-outs	B a	5	Patching & CFR CFR	1,447.2	Pos.	10,000 22,500	32,562,000	·	·	7		15	32,562,000	- 31
		Deck cracking Damages at anchorage of PC tendon	a	3	CFR (upper & bottom)	1,447.2	m <sup>2</sup> Pos,	45,000	52,562,000			<del> </del>				<u></u>
		Rebar exposure	a	5	Patching	280,1	_m <sup>2</sup>	17,500	4,901,800		-	7		- 15	-	- 3
Deck	03	Pop-outs Deck cracking	a	5	Patching & CFR CFR	1,447.2	Pos. m <sup>2</sup>	10,000 22,500	32,562,000	<u> </u>		<del>;</del>			32,562,000	-
	1	Damages at anchorage of PC tendon	8	5	CFR (upper & bottom)	1,111.2	Pos.			-		-				-
		Rebar exposure	a		Patching	280,1		17,500	4,901,800	:		7		- 15		- 3
	04	Pop-outs Deck emoking	a	5	Patelsing & CFR CFR	1,447.2	Pos. m <sup>2</sup>	10,000 22,500	32,562,000			- 7		15	32,562,000	3
	-	Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)		Pos.	45,000	-	-						-
	T T	Rebar exposure Pop-outs	a	5	Patching Patching & CFR	280.1	-m <sup>2</sup> Pos.	17,500	4,901,800			7		- 15		- 3
	05	Deck cracking	a		CFR	1,447.2	POS. m <sup>2</sup>		32,562,000	-		7		- 15	32,562,000	3
	1	Damages at anchorage of PC tendon	a	5	CFR (upper & bottom)	-	Pos.	45,000	-							-
	01	Cracking, Water leakage, Free lime Rebar exposure	C A	3	Resin injection Patching	5.54	m	5,000	27,700 39,200	<u>:</u>	27,700	7	<u> </u>	- 15	- 39 200	- 3 ); 3
Main tower	Ľ	Damages at anchorage of PC tendon	a	5	CFR (upper & bonom)	· · ·	Pos.	45,000		-		-				-
man ower	02	Cracking, Water leakage, Free lime	c	3	Resin injection	5.54		5,000	27,700		27,700	7		- 15	39.200	- <u>3</u>
	02	Rebar exposure Damages at anchorage of PC tendon	a	5	Patching CFR (upper & bottom)	2.24	m Pos.	45,000	39,200		1	+	· · · · ·		37,200	-
		Functional damage of bearings	n	5	Metal spraying		Pos.	120,000	120,000	•	-	7		- 15	120,000	
		Punctional damage of bearings	8	5	Metal spraying Metal spraying		Pos. Pos.		120,000			7		- 15 - 15	120,000	
Destruction		Functional damage of bearings Functional damage of bearings	a	5	Metal spraying		Pos.		120,000		1	7		- 15	120,000	
Bearings	201	Functional damage of bearings	a	5	Metal spraying	1.0	Pos.	120,000	120,000	-		7		- 15	120,000	3 3
	202	Functional damage of bearings Functional damage of bearings	a a	5	Metal spraying Metal spraying	1.0	Pos. Pos.	120,000	120,000			7		- 15	120,000	
· ·		Functional damage of bearings	a	5	Metal spraying	1.0	Pos.	120,000	120,000	-		7		- 15	120,000	) <u>s</u> 3
Road	01	Level difference of road surface	8	5	Pavement replacement	9,454.0	m <sup>2</sup>	5,000	47,270,000			5	ļ	- 10	10000	2
surface	01	Damages in pavemnients Damages in barriera	a	5	same as above Patching	9,454.0 46.68	m² ni	5,000	47,270,000 816,900		1	5		- 10	47,270,000 816,900	
Barriers	02	Damages in barriers	i a	5	Patching	46.68	В	17,500	816,900			7		- 15	816,900	<u>)</u> 3
		Damages in barriers	a	5	Patching	46.68	m	17,500	816,900			7		- 15	816.900	DE 3

Inspecton resu	lt				ونباني الرابية إيما	ويتر التقامي		······································							Span N	lo.		4
		Dam	ages of s	steel me	mbers	·	Damag	es of co	ncrete n	nembers				Otl	iers			
		Corrosion	Cracking	Missing bolts	Fracture	Cracking, Water leakage, Free lime	No	Rebar exposure	<sup>2</sup> op-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
~ 1	01					a		а			а							~
Girder	02	Sec. Sec.		and the second		a		a			a							
	03					a		a			а					and a second		·
Crossbeam	01	(10) (10)				a		a			a	i en	7.04					
Clossocalli	02					a a		a a			a							, <u>M</u> ,,,,,,,
	01	array to the	Part and a state			a		a	а	С	a			in the second			Contraction of the	· · · · · · · · · · · · · · · · · · ·
Deck	02		and a second					a	a	a							Calculate a	
	03				in the second	2		a	a	c								
cable	01				(1. 1. 1. d.)		12									1990 - 1990 1990 - 1990 1990 - 1990	9	
Pier	01					а		a						1				<u></u>
Road surface			and a second							and the second second	•	a						
Pavement		alla de la sec Guarda de la sec							tion ka						a		and sort of	
	01															a		
Barriers	02			des fordere	stratus b	and the second										a		
Railings	03	an a														а		
	04				1											a		

Estimation	of	repair	auantity

Brie	dge name		IRR North	Span No. 4
	Subject		Quantity	Remarks
1	Span length		74.50 m	Length of 1 span
2	Road width for pavement	t	29.00 m	Width for pavement area (Vehicle lane)
3	Total road width		35.80 m	Deck width
4	Area of bridge surface		2,667.1 m <sup>2</sup>	Span length x Total width
5	Area of pavement		$2,160.5 \text{ m}^2$	Span length x Width for pavement
		01	concrete	Type of barriers & railings
,		02	concrete	Same as above
.6	Barriers & railings	03	concrete	Same as above
		04	concrete	Same as above
7	E	01	steel	Type of expansion joint
7	Expansion joints	-	-	Same as above
	Crack length		Quantity	Remarks
	Total crack length	L	106.7 m	A of bridge surf. x 0.040
		01	10.7 m	$L \times 0.100$ assumed as 10%
0	Girder	02	64.0 m	$L \times 0.600$ assumed as 60%
8		03	10.7 m	$L \times 0.100$ assumed as 10%
		01	3.2 m	$L \times 0.030$ assumed as 3%
	Crossbeam	02	14.9 m	$L \times 0.140$ assumed as 14%
		03	3.2 m	$L \times 0.030$ assumed as 3%
	Area of rebarb exposure	•	Quantity	Remarks
	Total area	A	21.3 m <sup>2</sup>	A of bridge surf. x 0,008
		01	$2.1 m^2$	$L \times 0.100$ assumed as 10%
	Girder	02	12.8 m <sup>2</sup>	L × 0.600 assumed as 60%
9		03	$2.1 m^2$	$L \times 0.100$ assumed as 10%
		01	0.6 m <sup>2</sup>	$L \times 0.030$ assumed as 3%
	Crossbeam	02	$3.0 \text{ m}^2$	$L \times 0.140$ assumed as 14%
		03	0.6 m <sup>2</sup>	$L \times 0.030$ assumed as 3%
	Repaired area of deck		Quantity	Remarks
10	Divided area	A	625.8 m <sup>2</sup>	Deck width = 8.4 m Deck width for pos. x span length
10	Area of rebarb e	xposure	75.1 m <sup>2</sup>	A × 0.120
	Area of deck cra	ucking	388.0 m <sup>2</sup>	A × 0.620
	Repair quanity of pylon & subst	ructure	Quantity	Remarks
11	Cracking, Water leakage, 1	Free lime	5.54 m	per substructure
	Rebar exposure		2.24 m <sup>2</sup>	per substructure
10	Concrete barrier		Quantity	Remarks
12	Rebar exposure		$10.67 \text{ m}^2$	A of bridge surf. x 0.004

Counterme	easu	re classification of members				Bridge name		IRR North	Spar	1 No,	4
				nage ication					Dan classif	nage ication	
Member	No.	Damage	Classification	Judge	Countermeasure classification	Member	No.	Damage	Classification	Judge	Countermeasure classification
		Cracking, Water leakage, Free lime	а	-	5			Rebar exposure	a	- '	5
	01	Rebar exposure	a	-	5		01	Pop-outs	а	~	5
		Damages at anchorage of PC tendon	a	-	5	]		Deck cracking	с	-	3
		Cracking, Water leakage, Free lime	а		5			Rebar exposure	a		5
Girder	02	Rebar exposure	a	-	5	Deck	02	Pop-outs	а	-	5
		Damages at anchorage of PC tendon	а	-	5			Deck cracking	a	-	5
•		Cracking, Water leakage, Free lime	а	1	5			Rebar exposure	a		5
	03	Rebar exposure	а	-	5		03	Pop-outs	а	-	5
		Damages at anchorage of PC tendon	a	-	5			Deck cracking	С	-	3
		Cracking, Water leakage, Free lime	а	÷ .	5			Cracking, Water leakage, Free lime	C .	3	3
	01	Rebar exposure	а	-	5	Substructure	01	Rebar exposure	a	-	5
		Damages at anchorage of PC tendon	а	-	5	]		Damages in substructures	a	-	5
		Cracking, Water leakage, Free lime	a	-	5	Road surface	01	Level difference of road surface	a	-	5
Crossbeam	02	Rebar exposure	a	-	5		01	Damages in paverments	a	-	5
		Damages at anchorage of PC tendon	а	-	5		01	Damages in barriers	a	-	5
	÷	Cracking, Water leakage, Free lime	а	-	5	Barriers	02	Damages in barriers	а		5
	03	Rebar exposure	a	-	5	Railings	03	Damages in barriers	а	-	. 5
		Damages at anchorage of PC tendon	а	-	5		04	Damages in barriers	а	-	5
						Expansion joints	01	Damages in expansion joints	а	-	5

Approximate rep	Approximate repair price for countermeasure														
Bridge name		IRR North	臣		Span No	No.	4				-				
0		u	<u> </u>			-			Approximate	countermeasure classification 3		countermeasure classification 4	ITE 4	Planned repair & reconstruction	& n
Member No.	o.	otheofficselo ageme	untermeasure noiteofication	Repair method	Repair quantity	Unit	Approximate unit price (B)	Approximate repair price (B)	repair price for countermeasure classification 1 & 2 (B)	Remaini ng years Repair price up to counter measure ci. 2		Repair price (B)	Remaini ng years up to counter measure d. 2	Repair price (B)	cycle cycle
		-		Resin intection	10.7	E	5,000	53,500			7	-	15	4	8
	OT Defore exchange of the second of the seco	a «		Patching	2.1	۳4	17,500	36,800	- 1	1	7		15	36,800	30
2	Democra of anthering of DC feedon	5 9	+	Reinforcement with external PC tendon		Pos	1,000,000	1	-	1	4	-	-	'	-
	Condition All other lasher of trace line	3 9	╋	Resin injection	64.0	E	5,000	320,000	1	8	- -	'	15	1	<u>0</u>
Girder	17 Pehar evinesine	, «	1	Patching	12.8	m <sup>2</sup>	17,500	224,000	1	-	7	'	15	224,000	ñ
		e	H	Reinforcement with external PC tendon	•	Pos.	1,000,000	-	'		-	'	;	'	' ; ;
<u>ل</u>	Cracking/Water leakage/Free lime	8	┼╍	Resin injection	10.7	н	5,000	53,500	ʻ	-	-	'	15		9,6
	13 Rebar evrosite	e	5	Patching	2.1	m²	17,500	36,800	1	1	-		15 15	36,800	3
			5	Reinforcement with external PC tendon	•	Pos.	1,000,000	-	1		-	'	+	ľ	1
	Condring (Moter lestrand Tree lime			Resin injection	3.2	E	5,000	16,000	1	-	7	'	15		2
-	Ol Dahra evaname	: a	n iv	Patching	0.6	1 <sup>2</sup>	17,500	10,500	-	1	~	•	15	10,500	8
		5 a		Reinforcement with external PC tendon	'	· Pos.	1,000,000	-	F	-	-	1	·	-	1
	Conditional at an and a condition of the second sec	, ,	5	Resin injection	14.9	E	5,000	74,500	1	1	-	1	15		8
(Crocehaam	17 Dahar extrastire		5	Patching	3.0	- -	17,500	52,500	'	T	-	'	15	52,500	30
		5 0	م	Reinforcement with external PC tendon	'	Pos.	1,000,000		1	•		1	4	1	•
-	Conditional and an and the second of the lime		1.0	Resin injection	3.2	Ħ	5,000	16,000	'	'	-	1	15	and the second	9
24	03 Rehar expositive	e	5	Patching	0.6	m <sup>2</sup>	17,500	10,500	1		2	'	15	10,500	30
		8	ŀ.	Reinforcement with external PC tendon	•	Pos.	1,000,000	'	'	,	-	'	•	-	•
	Rehar exposure	B			75.1	m <sup>2</sup>	17,500	1,314,300			-	1	15	'	2
	01 Pon-outs	8	in In	Patching & CFR		Pos.	10,000	- <b>'</b>	'	1	-	-	•	-	' {
		υ	'n	CFR	388.0	m²	22,500	8,730,000	-	8,730,000	12	'	5	8,730,000	26
<u> </u>	Rebar exposure	a I	5	Patching	75.1	m²	17,500	1,314,300	1	•	~	1		•	8
Deck	02 Pop-outs	8	5	Patching & CFR		Pos.	10,000		'		•	F	' ' ' '	- 000 002 8	' lç
	Deck cracking	69	5	CFR	388.0	m <sup>2</sup>	22,500	8, /30,000	'	- -	77	,	34	20050C1 6	8
	Rebar exposure	a	S	Patching	75.1	<sup>7</sup> ш,	005/1	UVC, 412, 1		1	-				
	03 Pop-outs	, B	Ś	Patching & CFR	'	Pos.	10,000	1 000 000 0	'	0.000	<u>،</u>	'	, YC	000 026 8	ç
	Deck cracking	Ö.	m	CFR	388.0	r,∎	22,500	8,730,000		0,130,000	71	'	77	000500150	8
	Cracking/Water leakage/Free lime	c	33	Resin injection	5.54	Ħ	5,000	71,100		21,1UU	- 1	ĺ	2	000.00	39
Substructure	01 Rebar exposure	a	5	Patching	2.24	m²		39,200		-	+	'	2	007'26	3
 	Damages in substructures	a	5	Foot protection	1	Pier / pylon	1,75	1	'	-		ī	1 4	Ī	-
	11/20	e	5	Pavement replacement	1	$m^2$	5,000	-	1	•	2	1	01	1 002 000 0	38
Road surface	01 Pamaees in pavements	e	S	same as above	2,160.5	m²	5,000	10,802,500	'	1	ŝ	'	2	10,208,01	3
	01 Pamapes in harriers	e B	5	Patching.	10.67	m <sup>2</sup>	120,000	1,280,400	1	•	-	'	15	1,280,400	3
, Continue de	294		Ś	Patching.	10.67	, H	120,000	1,280,400	1	-	7	'	15	1,280,400	8
1	0.012	. «	5	Patching.	10.67	H	120,000	1,280,400	1	-	7	1	15	1,280,400	30
	0. Damages in barriers		5	Patchine.	10.67	11	120,000	1,280,400	•	•	7	'	15	1,280,400	80
Expansion	all reality	,		chance of steel evin	35.8	E	5.000	179,000	-		7	1	15	179,000	30
	anno maratata magamera 10		,	- Jacobia and Anna										n	]

Inspecton rest	ılt														Span N	lo.		5
		Dama	iges of s	teel me	mbers		Damag	es of co	ncrete n	iembers		· · · ·		Otl	ners	r		
		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 pavemnents	Damages in expansion joints	Damages in cable	Remarks
~	01					а		a			а							
Girder	02					a		a			а							
	03		n de services de la		and the second se	a		a	1. 1. A. 1.		<u>a</u>			·				
Crossbeam	01					a	10.710.000	a			<u>a</u>	Lagrand and the second			34-1	- f		
crossocam	02	te de la construcción de la construcción de la construcción				a a	and the second second	a		n an	<u>a</u>			<u></u>		la de la del		
	01	1			6	a		a	a	С	a		Contraction of the				Carl and	
Deck	02		1			and the second		a	a	a	en internet internet. En internet							
	03							a	a	c		1000		and the second se			1	
cable	01					1. S. M. P.				6	а							
Pier	01					с	1997 (1999) 1999 - State State (1999) 1999 - State (1999)	a										
	02		Constant P			С	and the second	a					177 (St. 4.)					
Road surface	)											а						
Pavement												5 (IC)			<sub>≪</sub> a΄			
<b>.</b> .	01			and the											( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	а		
Barriers	02	en generation and	Sec. State													а		
Railings	03	CAR SPECT				- 10 - 10				Construction Construction						а		
	04		er i							an an an a						а		
Expansion joints	01	and a state							46) 1				(4) (4)		ini. Malaysian		a	

# Estimation of repair quantity

	Imation of repair quantit	<u>y</u>	IRR North	Span No. 5
	Subject		Quantity	Remarks
1	Span length	· ·	50.63 m	Length of 1 span
2	Road width for pavement		29.00 m	Width for pavement area (Vehicle lane)
3	Total road width		35.80 m	Deck width
4	Area of bridge surface		1,812.6 m <sup>2</sup>	Span length x Total width
5	Area of pavement		1,468.3 m <sup>2</sup>	Span length x Width for pavement
_		01	concrete	Type of barriers & railings
		02	concrete	Same as above
6	Barriers & railings	03	concrete	Same as above
		04	concrete	Same as above
н. 1		01	steel	Type of expansion joint
7	Expansion joints	-		Same as above
	Crack length		Quantity	Remarks
	Total crack length	L	72.5 m	A of bridge surf. x 0.040
		01	7.3 m	$L \times 0.100$ assumed as 10%
	Girder	02	43.5 m	$L \times 0.600$ assumed as 60%
8		03	7.3 m	$L \times 0.100$ assumed as 10%
		01	2.2 m	$L \times 0.030$ assumed as 3%
	Crossbeam	02	10.2 m	$L \times 0.140$ assumed as 14%
		03	2.2 m	$L \times 0.030$ assumed as 3%
	Area of rebarb exposure		Quantity	Remarks
	Total area	А	14.5 m <sup>2</sup>	A of bridge surf. x 0.008
		01	1.5 m <sup>2</sup>	$L \times 0.100$ assumed as 10%
9	Girder	02	8.7 m <sup>2</sup>	$L \times 0.600$ assumed as 60%
9		03	1.5 m <sup>2</sup>	$L \times 0.100$ assumed as 10%
		01	0.4 m <sup>2</sup>	
	Crossbeam	02	2.0 m <sup>2</sup>	$L \times 0.140$ assumed as 14%
		03	0.4 m <sup>2</sup>	$L \times 0.030$ assumed as 3%
	Repaired area of deck		Quantity	Remarks
10	Divided area	А	425.3 m <sup>2</sup>	Deck width = 8.4 m Deck width for pos. x span length
10	Area of rebarb e	exposure	51.0 m <sup>2</sup>	A × 0.120
	Area of deck cra	acking	263.7 m <sup>2</sup>	A × 0.620
	Repair quanity of pylon & subst	ructure	Quantity	Remarks
11	Cracking, Water leakage,	Free lime	5.54 m	per substructure
	Rebar exposure		$2.24 m^2$	per substructure
12	Concrete barrier		Quantity	Remarks
12	Rebar exposure		7.25 m <sup>2</sup>	A of bridge surf. x $0.004$

Counterme	asur	e classification of members				Bridge name		IRR North	Spar	1 No.	5
			Dan classifi	-						~	
Member	No.	Damage	Classification	Judge	Countermeasure classification	Member	No.	Damage	Damage classification "officiention "officiention "officiention" "	Judge	Countermeasure classification
		Cracking, Water leakage, Free lime	ક્ષ	1	5			Rebar exposure	а		5
	01	Rebar exposure	а	-	. 5	]	01	Pop-outs	а	-	5
		Damages at anchorage of PC tendon	a	-	5	] .		Deck cracking	C	-	3
		Cracking, Water leakage, Free lime	a	-	5			Rebar exposure	a	- <u>-</u> .	5
Girder	02	Rebar exposure	a	-	5	Deck	02	Pop-outs	a	-	5
		Damages at anchorage of PC tendon	а	-	5			Deck cracking	a	-	5
		Cracking, Water leakage, Free lime	а	-	5	]		Rebar exposure	a		5
	03	Rebar exposure	а	-	- 5	] . :	03	Pop-outs	a	-	5
		Damages at anchorage of PC tendon	а	-	5			Deck cracking	с	-	3
		Cracking, Water leakage, Free lime	a		5			Cracking, Water leakage, Free lime	C	· -	3
	01	Rebar exposure	а	-	5	]	01	Rebar exposure	a	-	5
		Damages at anchorage of PC tendon	а	*	5	Substructure		Damages in substructures	a	1	5
		Cracking, Water leakage, Free lime	а	-	5	Substitute		Cracking, Water leakage, Free lime	С		3
Crossbeam	02	Rebar exposure	а	-	5	] .	02	Rebar exposure	a	-	5
		Damages at anchorage of PC tendon	a		5.			Damages in substructures	a	- '	. 5
		Cracking, Water leakage, Free lime	a		5	Road surface	01	Level difference of road surface	a	-	5
	03	Rebar exposure	а	-	5	KOad Satlace	01	Damages in pavemnents	a	-	5
		Damages at anchorage of PC tendon	а	-	5		01	Damages in barriers	a	-	5
						Barriers	02	Damages in barriers	а	-	5
						Railings	03	Damages in barriers	а	-	5
							04	Damages in barriers	a		5
						Expansion joints	01	Damages in expansion joints	а	-	5

	•													
	41	IRR North	orth	Span No	n No.	5								100
		, u						Approximate	countermeasure classification 3	ure 13	countermeasure classification 4	ure n.4	Planned repair & reconstruction	. & በ
	Damage	Damage classification	Countermeasure Repair method An method	Repair quantity	Unit	Approximate unit price (B)	Approximate repair price [B]	repair price for countermeasure classification 1 & 2 (B)	Repair price (B)	Remain ng years up to counter measure cl. 2	Repair price (B)	Remaini ng years up to counter measure cl. 2	Rom mee	Life cycle
	Crackine/Water leakage/Free lime	в	5 Resin injection	7.3	н	5,000	36,500		I	~	1	15		8
	Rebar exposure	et	5 Patching	1.5	m²	17,500	26,300	-	1	-	1	15	26,300	30
	Damages at anchorage of PC tendon	e	Reinforcement	T	Pos.	1,000,000	1	+	1	ŗ	•	•	1	
	Cracking/Water leakage/Free lime	63	┝╌┥	43.5	E,	5,000	217,500	1	,	-		15	-	30
	Rebar exposure	13 13	Patching	8.7	<sup>7</sup> æ	1 000,000	122,500	•	1			2	- Mor'zrt	3
21	Damages at anchorage of PC tendon	63	5 Remiorcement with external PC tendon	73	50 E	5 000	36.500			7	•	15		30
<b>c</b> ) 後	Cracking/Water leakage/Free lime	n 107	2 NCSHI ILJCULIOI	1.1	12	17 500	26,300		1	L		15	26,300	30
	Rebar exposure	• •	R einforcement		Pos	1.000.000				'		1	-	
d17	Camages at anonorage of relition		Resin injection	22	E	5.000	11.000	t	1	7	1	15	-	30
120	Clarking watel reaspect to mus	3 9		0.4	2 <sup>m</sup>	17,500	7,000	1	•	7	1	15	7,000	30
91 C	Demages at anchorage of PC tendom	5 rc	Reinforcement		Pos.	1,000,000	1	-		*	1	'	ţ	•
317	Catchino/Water leakaoe/Free lime		+	10.2	a	5,000	51,000	-	1	7		15	-	30
7100	ehar exosure	8		2.0	۳ ۳	17,500	35,000	-	•	7	•	15	35,000	30
8 E	Damages at anchorage of PC tendon	63	Reinforcement	.1	Pos.	1,000,000	•	-	1	1	'	'	-	'
	Tracking/Water leakage/Free lime	60	Resin injection	2.2	B	5,000	11,000	-	1	6	1	15	1	8
3185	Rehar exposure	e 8		0.4	m²	17,500	7,000	-	1.	7	1	15	7,000	30
8 C	Damages at anchorage of PC tendon	•	5 Reinforcement with external PC tendon	1	Pos.	1,000,000	*	-	l	1	'	7	-	'
1 9	Rebar exposure	•	┢─	51.0	m²	17,500	892,500	1		7	-	15	I	30
IΤ	Pon-outs	8	5 Patching & CFR	-	Pos.	10,000	•			ľ	1	'	-	1
<b>法法</b>	Deck cracking	υ	3 CFR	263.7	m²	22,500	5,933,300	-	5,933,300	12		25	5,933,300	50
	Rebar exposure	8	5 Patching	51.0	m <sup>2</sup>	17,500	892,500	-	1	-	1	2	-	30
	Pop-outs	в	5 Patching & CFR		,Pos.	10,000	'	-	1	'	1	•		1
	Deck cracking	8	5 CFR	263.7	m²	22,500	5,933,300	'	•	12	'	3	5,955,500	20
	Rebar exposure	8	5 Patching	51.0	m²	17,500	892,500	1	L			c	1	2
	Pop-outs	5	Patch			10,000	- 000 000 L	•	1000 000 2	' <u>-</u>		- 20	-	- 05
99 Q -	Deck cracking	ų		1.502		000-2	000,000,0	'	002.55	1 1	'	34	0000000	30
0	Cracking/Water leakage/Free lime	υ	Ke	40.0		000°C	00/17	'	71,100		•	2 4	000.00	30
S 50 1	Rehar exposure	e		2.24	_	1000,000	59,200	-		Ì		-	007.20	20
81	Damages in substructures	æ	5 Foot protection		rier T			'		' ['				QC C
<b>'</b> 0'	Cracking/Water leakage/Free lime	0	3 Resin injection	5.54	E	000,5	21,100	'	21,100			<u>-</u>		20
が空け	Rebar exposure	a	5 Patching	2.24			39,200	1	1	-	'	L	39,200	05
	Damages in substructures	ę	5 Foot protection	,r L	Pier / pylon	1,750,000	-	-	•	'	-	ľ	-	'
翻出	evel difference of road surface	65	5 Pavement replacement	•	m <sup>2</sup>	5,000	-	-	'	ŝ	ſ	10	1	20
新設市	Damages in naverments	8	5 same as above	1,468.3		5,000	7,341,400	-	•	5	1	10	7,341,400	20
白田市	Jamaors in hamiers	6	5 Patching.	7.25	1 <sup>2</sup>	120,000	870,000	-	'	5	•	15	870,000	30
6182	Number in harring			7.25		120.000	870,000	•	1	7	ſ	15	870,000	0E
利潤	Jagos III Valintas	3 e		26.6		120.000	870.000	1		-	-	15	870,000	30
- I B-	ounages in bailtes	3 0		7.25		120,000	870,000	1		7	•	15	870,000	30
	Lamages III oatutas			0 2 6		000527	170,000			L		15	000.621	06

### Approximate total repair cost

Appro	ximate total repa	ir cost		Annu	al repair cost (B)			
Year	Span No.1	Span No.2	Span No.3	Span No.4	Span No.5	Periodic inspection	Bridge total	Cummalative cost (B)
2011	-		-	-		+ reserve for unexpected matters 233,400	233,400	233,400
2012 2013	-	-	-	-		-	-	233,400 233,400
2014 2015							-	233,400
2016			-	-		233,400	233,400	<u>233,400</u> 466,800
2017 2018	55,400	27,700	55,400	27,700	55,400		221,600	466,800
2019 2020	-	-	-					<u>688,400</u> 688,400
2021	-	-		-		233,400	233,400	688,400 921,800
2022 2023	11,866,600	-	-	17,460,000	11,866,600	-	41,193,200	921,800 42,115,000
2024 2025			-	-				42,115,000
2026			-			233,400	233,400	42,115,000 42,348,400
2027		-	-		-		-	42,348,400 42,348,400
2029		-	-		•		-	42,348,400
2031	7,341,400	10,802,500	139,402,400	10,802,500	7,341,400	233,400	175,923,600	42,348,400 218,272,000
2032 2033	-		-	-				<u>218,272,000</u> 218,272,000
2034 2035		-	-	-	-	-		218,272,000
2036						233,400	233,400	<u>218,272,000</u> 218,505,400
2037 2038	-	- /	-	-	-		-	218,505,400 218,505,400
2039 2040	-		-	-			-	218,505,400 218,505,400
2041 2042	3,558,400	5,160,800	167,116,000	5,160,800	3,558,400	233,400	184,787,800	403,293,200
2043	-	-		- -	-		-	403,293,200 403,293,200
2044	-	-	-	-	-		-	403,293,200 403,293,200
2046 2047	-	-	-		-	233,400	233,400	403,526,600
2048	-	-	-	-			-	<u>403,526,600</u> 403,526,600
2049 2050	-	-	<u> </u>	-	-			403,526,600 403,526,600
2051 2052	7,341,400		139,402,400	- 10,802,500	7,341,400	233,400	233,400	403,760,000
2053		- 10,802,500	135,402,400	-	/,341,400	-	175,690,200	<u>579,450,200</u> 579,450,200
2054 2055	-	-		-		-	-	579,450,200 579,450,200
2056 2057	-	-	-			233,400	233,400	579,683,600
2058		-	-	-	-			579,683,600 579,683,600
2059 2060	-	-	-	· ·		-		579,683,600 579,683,600
2061	5,933,300	26,190,000	-	8,730,000	5,933,300	233,400	47,020,000	626,703,600 626,703,600
2063 2064	-	-	-	-		-		626,703,600
2065	-	-	-	-		-		<u>626,703,600</u> 626,703,600
2066	-	-		-		233,400	233,400	626,937,000 626,937,000
2068	-	-	-	-				626,937,000
2070	-		-	-		-		<u>626,937,000</u> 626,937,000
2071	3,558,400	5,160,800	167,116,000	5,160,800	3,558,400	233,400	233,400 184,554,400	627,170,400 811,724,800
2073	7,341,400	10,802,500	139,402,400	10,802,500	7,341,400		175,690,200 41,193,200	987,415,000
2075		-			-			1,028,608,200
2076 2077	-	-	-		-	233,400	233,400	1,028,841,600
2078 2079	-	-	-	-				1,028,841,600 1,028,841,600
2080 2081	-	-	-	-	-	233,400		1,028,841,600
2082	-	-	-	-		233,400	233,400	1,029,075,000 1,029,075,000
2083 2084		-	-	-		-		1,029,075,000
2085 2086	-	-	-	-	-	233,400	233,400	1,029,075,000
2087		-	-	-	-		-	1,029,308,400 1,029,308,400
2088 2089	-	-	-	-			-	1,029,308,400
2090 2091	-					233,400	233,400	1.029,308,400 1.029,541,800
2092	-	-	-	-	-			1,029,541,800
2093 2094	7,341,400	- 10,802,500	139,402,400	- 10,802,500	7,341,400		175,690,200	1,029,541,800 1,205,232,000
2095	-			-	-	- 233,400	233,400	1,205,232,000
2097		•	-	-	-		*	1,205,465,400
2098 2099	-	-		-	-			1,205,465,400
2100 2101		-	-	-	· •	233,400	233,400	1,205,465,400 1,205,698,800
2102	0.520.100	-	-	-	-		-	1,205,698,800
2103 2104	3,558,400	5,160,800	167,116,000	5,160,800	3,558,400	-	184,554,400	1,390,253,200
2105 2106		-	-		-	233.400	233,400	1,390,253,200
2107		-	-	-	-			1,390,486,600
2108 2109	-	-	-	-	249-			1,390,486,600 1,390,486,600
2110	-	-		- [	210-1	-	-	1,390,486,600

